bards and hilts, and other ornamental parts of the sword, are also polished in much the same manner. In the case of scabbards, a larger wheel is used instead of the ordinary lathe brushes. When polished, the blade is ready for the hilt and scabbard; so we will now see how these are made. And first for the scabbard.

MAKING THE SWORD SCABBARDS.

In making a scabbard, the workman takes a piece of flat steel cut to the required size. He first places it on the top of an open vise, and beats it with a wedge-shaped wooden mallet, bringing the two edges closer together each time it passes along the vise. It is then beaten on both sides until they almost meet; a mandrel is then put down it, and the steel beaten close round the mandrel, both edges being hammered over. The edges are then soldered. It is next beaten on an anvil all round, the mandrel is withdrawn, and the scabbard is ready for the drag, which is a piece of iron fitted to, and fastened on, the bottom of the scabbard. The bands are then put on, and the scabbard, after being filed and smoothed, is ready to be polished.

MAKING THE SWORD GRIPS.

The making of the grips is also a very interesting bit of work. These are the handles by which the sword is gripped, hence the name. A grip at first is a bit of walnut, oblong in shape, but narrower at the end than the top. The back, which is made of metal, is placed on it, and the wood is worked into the required shape by files. A large number of different shapes, sizes, and cutting powers are used in this work. When the top has been cut, the grip shaped, and the tenon for the ferrule made, it is then "balled." For this purpose it is fastened in a vise, a three-sided file cuts a deep indention at regular intervals, each division is rounded or balled by a file, and the indentions connected by slanting interstices cut by a handsaw. The grip is then drilled through in a lathe, for the purpose of receiving the tang. When this has been done, a piece of the skin of a dog fish, which has been a long time soaked in water, is cut off. Every bit of flesh on the inside of the skin is then carefully cut off, and a piece of pure skin is left. This is put round the grip, a piece of string or wire is fixed by a loop to a piece of steel fastened in the vise, and the workman binds the skin tightly round the grip by winding the string or wire round the space between each ball. It is then filed and the back fitted on again. In making a grip, it passes through the workman's hands no fewer than thirteen times.

DRESSING THE HILTS.

A hilt is at first a flat bit of metal of a peculiar shape, and may be cut to any pattern. A large number of these are used, which are all made to a regulation size. The pattern used is placed on the metal, which is then marked. They are then filed and cut by hand, beaten on blocks and knobs into the shape of the hand, and afterwards polished, and made ready to be fixed to the sword.

This is called mounting. In the cheaper swords, the blade is bought from one person, the hilt from another, the scabbard from a third, and so on. But in this manufactory every part is made in the works, and each piece is prepared to suit and fit the other parts, so that when fitted together the sword is firm and sound; and the parts never give way or become loose, as they do when stuck on to the tang of a blade without any reference to their weight or suitability for each other and the blade to which they are attached. In such cases the parts with little wear become loose and rickety, and depend only upon the small rivet at the top for their security. In ordinary swords the blades and hilts, after having been ground, filed, and polished, are taken into the mounting shop. There the tang is placed in the grip. The hilt is fastened on by passing a rivet into the top of the grip, and fastening it to the tang. The hilt is drawn over this rivet, which passes through a hole at the top. It is then filed and broken off at a short distance from the hilt. The rivet is then welted by being filed, and smoothed until it has the appearance of an ornamental knob, forming an integral part of the hilt. These swords are now complete. In the mounting of best work, great care and skill are required. In the mounting shop, a very ingenious tool is used, called a float. It is a long bit of steel, shaped almost like a tang, with a series of blades along its surface. The grip is worked to and-fro on the float until it is cut to the exact size and shape of the tang on which it is to be fixed. Great skill is required in this delicate operation. In this mounting room the swords are proved. This is done by placing the point of the blade on the floor, and bending it backwards and forwards. After it has stood this test, it is subject to another. The workman strikes the blade strongly on a wooden block, both on the edge and back, and can tell by the ring whether it is of true and perfect quality. By these tests the slightest fault or flaw would be detected, for a very small fault, indeed, would cause the blade to break.

The scabbards are lined. In the ordinary sword, two thin strips of wood of the shape of the scabbard are placed on either side, and they must fit so accurately that neither in drawing nor in sheathing the sword must the slightest obstruction be perceptible. In the better swords, leather is used in lining.

In the mounting and ornamenting of swords, any amount of artistic work can be employed either on the blade, the hilt, or the scabbard. The rank of the officer is indicated in this manner, and naval swords are ornamented differently to military. The work put on presentation swords is often most elaborate and expensive.

A NEW PAVEMENT, by Charles Pennington, of London, consists of a bed of concrete covered with an elastic layer, such as tar and tan bark. On this layer the blocks of stone are set, the crevices being filled with concrete.

A NEW SCIENTIFIC MUSEUM.

Operations have begun for the erection of the Peabody Museum in New Haven, which, when completed, will contain some of the largest and richest zöological, geological, and mineralogical collections in the world. The institution is founded under a bequest of $150,000 from the late George Peabody, and is designed to bear the same relation to Yale College as the present Museum of Comparative Zöology does to Harvard.

The building will consist of a central edifice and two wings. For the present, only one of the latter is to be erected, with a frontage of 115 feet on one street and 100 feet on another. It will cost $160,000. be built of brick with stone trimmings, fireproof, and contain, including basement four available stories.

The fourth story is assigned to archæology and ethnology, the third to zöology, the second to geology, the first to lecture rooms and mineralogical collections, and the basement to working apartments and a large class of heavy specimens, showing fossils, foot prints, etc.

The Brazilian Telegraph.

The great ocean cable between Lisbon, Portugal, *viâ* the Azores, and Rio Janeiro, Brazil, is now complete and open for business. The charges from New York to Rio Janeiro are about $2.50 per word. The message goes *viâ* England, and through some eight thousand miles of submerged cables. Complimentary messages have been exchanged between President Grant, the Emperor of Brazil, the President of the Argentine Republic, and the President of Uruguay.

Last year the section of the above cable between Lisbon and Madeira was broken, and so remained until the present summer, when the two ends were fished up, joined, and relaid. The depth of water at the place of fracture was 2,500 fathoms, or about 2½ miles deep, and the successful finding, raising, and joining of the broken ends at sea, shows the great perfection of mechanism and skill that has been acquired in ocean telegraph engineering.

Fast Trotting.

At the Buffalo, N. Y., races, August 7, the famous horse "Goldsmith Maid" trotted the mile in 2m. 15½s. After the race, the Maid was stripped and led in front of the judges' stand, when the immense crowd arose and greeted her with deafening cheers. Her driver, Budd Doble, was ordered on the judges' stand, where he received a becoming ovation. In 1867, the racer "Ethan Allen" trotted a mile in 2m. 15s. But both these performances were surpassed by one of "Goldsmith Maid's" three one mile heats at Rochester, N. Y., on August 12, which was trotted in 2m. 14¾s.

Running horses make much quicker time than trotters. In 1850, the English horse "Black Doctor" is reported to have run the mile in 1m. 40s.

The Chassepot as Altered.

Two years ago, the French government decided to adopt the metallic cartridge in its military equipments, and an official commission was appointed to ascertain the best plan for altering the Chassepot rifles, one million or more in number, so as to receive the new ammunition. The commission has just decided to adopt the plan of alteration proposed by M. Gras, Captain of Artillery. The altered Chassepots will have a range of from one and a half to two miles. At a range of one and a half miles, the bullet has force enough to flatten against an iron plate. The accuracy of fire is very satisfactory.

The August Meteoric Shower.

In the vicinity of New York, clouds obscured the heavens on the evening of August 10, and few observations of meteors were made. But we learn from a correspondent at Martha's Vineyard, Mass., that, near Edgartown, many beautiful meteors were seen.

DECISIONS OF THE COURTS.

United States Circuit Court.—District of Massachusetts.

BOTTLE FASTENER.—PATENT OF H. W. PUTNAM, GRANTED MARCH 15, 1859 AND EXTEDED FOR SEVEN YEARS, FROM MARCH 15, 1873.—HENRY W. PUTNAM *vs.* EPHRAIM D. WEATHERBEE, *et al.*

[Heard at Portland, Me., July 10, 1874.]

Shepley, Judge:

In the view which I take of the first claim of this patent, which is "forming the fastener at the part that comes over the cork of a piece of wire of U form, with the ends returned and connected to the bottle, in order that the pressure on the cork or stopper may cause the fastener to hold more securely, as specified," considering it in connection with the specification in the patent, it is not necessary that the wire which forms the U should be returned upon itself in a direction directly the reverse of that in which it is before the turn; but it is a sufficient compliance with the first claim of that patent if the wire, instead of being returned in a reverse direction from that which it had before, is returned at right angles, or approximately so, so as to be connected with the wire which encircles the neck of the bottle in the manner specified in the patent. In the construction which I give to this first claim there can be no question that the defendant's contrivance is an infringement. The only question, therefore, for consideration is whether the first claim of this patent be or be not a valid claim, and that question is one of significance, principally in its relation to the Allender contrivance. The Allender contrivance was considered by the Commissioner of Patents when this patent was granted. The disclaimer of the patentee clearly has reference to a contrivance like the Allender contrivance; and, taking that into consideration, the Patent Office granted the patent. It has since been sustained by the adjudications of several of the federal courts, it has been in existence a long time, and it has been renewed by the Patent Office after the expiration of the original term. Under these circumstances I think this is a clear case, in which the patentee is entitled to the presumption, *prima facie*, which his patent gives, aided as it is by the long enjoyment and by the adjudications of the courts, and is entitled to protection by a preliminary injunction.

In the construction which I give of the claim, the only defence which could be maintained would be to destroy the validity of the plaintiff's patent; and I think, when the patent has been in existence so long, has been renewed after a contest, and has been adjudicated in favor of the patentee by the courts, he is entitled to the benefit of it until the adjudication of some tribunal shall decide that his patent is invalid.

This case is pending in the Massachusetts district, and when the court is in session there, the order for a preliminary injunction will be issued.

I do not express any opinion as to the question which has been presented in the hearing on this case as to the validity of the issue of this patent, with reference to the existence of the Allender contrivance; but, as I have before said, I think the position in which the patent stands entitles the patentee, upon well established principles, to the benefit of the legal presumption in his favor until that question is decided.

[*W. H. Clifford* and *Thomas H. Dodge*, for complainant. *Benjamin F. Thurston*, for defendant.]

United States Circuit Court, Southern District of Ohio.

PATENT BOILER FURNACE.—GIDEON BANTZ *vs.* JACOB ELSAS *et al.*

[In equity.—Before Swing, J.—Decided June, 1874.]

SWING, Judge.

The bill in this case alleges that the complainant was the original and first inventor of an "improvement in boiler furnaces for burning wet fuel," for which he received a patent, June 22, 1858; that he surrendered said letters patent February 6, 1872, and obtained new letters patent therefor, which were afterward extended for seven years from June 22, 1872. The bill then prays that defendants may be compelled to account for and pay over the profits of the infringement, and may be enjoined from making, vending, or in anywise using the patented improvement.

It is claimed, by respondents, that there is no infringement, because the combustion chamber or reservoir of the complainant is one having a *cyma-reversa* bottom, with narrow throat, whereas the combustion chamber or reservoir of the respondents has not the *cyma-reversa* bottom, but has one which is flat and set inclined, and has a wide throat instead of a narrow one.

I think, however, that the leading idea of the complainant is found in a combustion chamber or reservoir arranged in its relations with the fire chamber and boiler, for a particular purpose, rather than in the particular form of the back or throat of such chamber or reservoir.

Decree for complainant.

[*John E. Hatch* and *Fisher & Duncan*, for complainant. *Jacob Schroeder*, for defendants.]

United States Circuit Court—District of Massachusetts.

PATENT TABLE TRAY.—LUCY A. DOHERTY, ADMINISTRATRIX, *vs.* JAMES G. HAYNES.

[In equity.—Before Clifford, Judge.—Decided May 29, 1874.]

CLIFFORD, Judge.

Letters patent were granted to Nathaniel Waterman, on May 12, 1863, for an invention consisting of an improved table tray or waiter, as fully described in the specification, and the record shows that the original letters patent were subsequently surrendered and reissued, as alleged in the bill of complaint, and that the complainant is the sole owner of the described invention, as secured in the reissued patent on which the suit is founded. Various defenses are set up in the answer, of which the following are the only ones which require to be noticed:

First. That the invention is not patentable.

Second. That the person named in the original patent, as the patentee, was not the original and first inventor of the improvement.

Third. That the reissued letters patent were fraudulently obtained in violation of the rights of the respondent, and that the patent as reissued "covers more that was contained" in the original patent.

Decree for complainant.

[*A. A. Ranney*, for complainant. *C. D. Wright*, for defendant.]

NEW BOOKS AND PUBLICATIONS.

AN ILLUMINATED HISTORY OF THE WORLD.

We have lately received an educational novelty, which, after examination, we can recommend to the notice of teachers and students as a valuable and useful aid to study. It is a chart, handsomely mounted and printed in colors, and in dimensions twenty-two feet long by thirty inches wide. Its aim is to teach the history of the world, biblical, ancient, mediæval, and modern, ranging over the entire period of human knowledge, from 4004 B.C. to 1874 A.D., or 5,878 years of historic time. The plan adopted, which is a very ingenious one, is to represent the progress of time by a continuous black line, which is divided into centuries, decades, and years. Parallel with this are other lines, or streams, representing nations, and the division or flowing together of these indicates conquests, foundations of new States, and similar events. The arrangement of the map is such that the student sees at a glance exactly the condition of the world at any given date; and by the aid of colors, pictures, and similar helps, he is given an idea of the progress of arts, names and succession of rulers, and similar facts important to be remembered. We need not point out the obvious utility of this remarkable production, since it is well known that, while a person may readily master the history of one people, he frequently, in taking up that of another nation, is at a loss to connect contemporaneous events, and hence the various records remain detached in his mind, instead of uniting to form a single and detailed history of mankind. With the chart under review, such a difficulty need not be encountered, since the student, while at work upon the history of a single nation, need only glance at the map to be informed at once as to what the rest of the world was doing during the periods passed over. The execution of the work is excellent, and indicates an immense amount of labor and research on the part of the author, which should not go unrewarded. The length of the map necessitates its mounting upon rollers and arrangement in a neat frame, in which it is hung against the wall so as not to occupy more than three feet of space, suitable cranks on the ends of the rollers allowing the chart to be unwound like a panorama. The author is Mr. S. C. Adams, of Cincinnati, Ohio. The price is $15.

MANUAL OF PATENT LAW, with an Appendix upon the Sale of Patents. By William Edgar Simonds, Counsellor in Patent Cases. Hartford, Conn.: Published by the Author.

A concise and useful little book, explanatory of the patent law and practice.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From July 22 to July 30, 1874, inclusive.

CORSET CLASP.—J. P. McLean, Brooklyn, N.Y.
ELECTRIC TELEGRAPH.—R. K Boyle, New York city.
ELECTRO-MAGNETIC GOVERNOR.—J. M. Bradford, Portland, Me.
FASTENING SEAMS.—J. W. Davis *et al.*, San Francisco, Cal.
FAUCET.—F. Roach, Boston, Mass.
MATTRESS.—G. N. Torrance (of Philadelphia, Pa.), London, England.
NEEDLE-THREADING HOOK.—H. Wells, Woburn, Mass.
OIL FROM PETROLEUM.—H. W. C. Tweddle (of N. Y. city), London, Eng.
PACKING FOR BOTTLES, ETC.—O. Long, Boston, Mass.
REAPING MACHINE.—W. A. Wood Company, Hoosick Falls, N. Y.
SAFETY LAMP.—B. Tappan, Steubenville, Ohio.
SOLAR COMPASS.—C. T. Pierson, Ramapo, N. Y.
SPECULUM.—E. D. Pape, New York city.
STEAM PUMP.—W. Atkinson, Gardner, Ill.
STEEL MANUFACTURE.—T. S. Blair, Pittsburgh, Pa.
TAPE WEAVING MACHINE.—F. F. Burlock, Birmingham, Conn.
TRANSMITTING MUSIC BY ELECTRICITY.—E. Gray, Chicago, Ill.

Recent American and Foreign Patents.

Improved Fireproof Roof.

Frederic J. Hoyt, Batavia, N. Y.—The object of this invention is to render the roofs of buildings in blocks, or where built close to one another, not only waterproof but fireproof. The ordinary flat roof is built on an incline from front to rear, and is covered with a waterproof composition. The front wall is extended a foot or more above the roof. The side walls and rear wall are brought to a level with the front wall, leaving spaces in the side walls near the top, for fitting in joists three feet apart, on which, from front to rear, strips of wood are fastened on edgewise, one fourth inch apart. This is covered with a waterproof composition, on top of which is placed two to three inches of loose gravel, screened so that none will pass through the openings into the lower roof. The water passing through this upper roof falls on the lower roof, and runs off by conductors arranged through the wall and into the lower roof in the ordinary manner, which also serve as air holes to ventilate the space between the two roofs.

Improved Lantern.

Daniel Lordon, Fremont Center, Mich.—The bottom of the lantern is made double, with a series of holes connecting with a hollow space for purposes of ventilation, a chamber beneath the wick chamber, and a tube, connected therewith, which passes upward through the globe. An oil tube on the globe connects the oil chamber with the wick chamber. A wick in the end of the oil tube may be adjusted to allow the oil to flow to the wick chamber fast or slow. There is an inverted funnel over an opening through the oil chamber connected with the tube by which heat is conducted down beneath the wick chamber. A strong current of heated air passes up through the opening, and is caught by the inverted funnel. The oil in the wick chamber is thus soon heated, and the burners consequently afford a clear and bright flame.

Improved Expansible Wedge.

Robert Nesbitt, Franklin, Pa., assignor to himself and J. E. Tiktob, same place.—This wedge is composed of two tapering pieces, triangular in cross section, having the outer edge of each piece serrated to prevent withdrawal. A tapering screw engages with a tapering female screw, cut between the two parts of the wedge, and, when driven down, expands the parts.

Improved Machine for Perforating Paper.

Lyman A. Dyson, Enfield, Conn.—This invention consists of a serial punching machine, for perforating duplicate sets of pattern cards for jacquard or figured weaving, and for perforating figures or designs for other purposes, in which the punches are arranged so that, for making different patterns, some of them may be permitted to rise and not perforate, while others are held so as to perforate, the material to be perforated being moved against the punches. A perforated sexagon beam, termed a card cylinder, working the pattern cards of the pattern to be perforated, is combined with the punching machine, and is so contrived that the pattern cards of the pattern to be perforated or duplicated move keys (which act as stops to punches) from over the punches which are not to act, and allow them to rise and allow other keys to remain over those punches which are to act, and retain those in their working position; or the operation may be the reverse of this, moving keys over punches which are to act, and allowing the keys for punches which are not to act to remain stationary. After each operation, there is a plate so combined with the working of the perforated cylinder, and keys which act as stops to the punches, as to return all the keys to their first position for the selection from the whole by the next pattern card, and thus cause the perforation to be made in accordance with the pattern to be duplicated or perforated, whatever it may be.

Improved Sad Iron.

Charles H. Rathbun and Henry Shaw, Worcester, Mass.—The iron has two holes bored in it close together, near the center of the top, in its longitudinal axis, said holes being slightly inclined from each other from the top downward. The standards are jointed together, and below the joint have the vertical portion fitted to enter the holes. Above the joint they branch apart wide enough to receive a wood handle, which has a rod extending through it, with a screw-threaded projection at one end screwing into one standard, and a square and round projection at the other end passing through a square hole in the standard, and having the cam pivoted to its end. The cam is arranged to press the standards toward the handle when turned downward, so as to cause the parts to bind in the holes, and thus make the handle fast to the iron. By releasing the cam, and shifting the round part of the rod into the hole of the standard, the rod may be turned to adjust the handle for holes, more or less distant from each other, or of different sizes, and to regulate the binding pressure.

Improved Earth Auger.

Dexter Page, Monticello, Iowa.—The sand auger is provided with valves, which take up the loose substances fed by the cutters of the auger. A cylindrical bucket fits tightly to a rim of the auger, and slides by means of its conical top part on the auger shaft, to which it is firmly applied by a set screw. The conical top prevents the bucket from catching under the curb when working inside or under it. The load of the bucket is readily discharged at the top of the well by loosening the set screw and raising the bucket, the sand flowing instantly out between the auger and the lower end of the bucket. When the bucket is filled with muddy water, the sediment closes every crevice in the bottom and makes the bucket therefore watertight.

Device for Keeping Steam Boilers Clear of Scale and Sediment.

William O'Brien, Mattoon, Ill.—The scraping frame is composed of longitudinal bars, having cross bars firmly riveted or bolted to them. The two cross bars at the ends of the frame are provided with eyes. Stationary rods are attached to the sides of the boiler, which support the frame by means of those eyes. The frame, as a whole, is an arc of a circle of a diameter corresponding with the boiler. Scrapers are attached to the bottom of each cross bar, which, as the frame is moved back and forth, are placed so as to just clear the bottom of the boiler and scrape therefrom any sediment or scale which may settle on the bottom. This frame is operated from the front of the boiler by means of a rod, which passes through the head.

Improved Riding Plow.

John H. Payton, Rantoul, Ill.—This is an improved riding or sulky plow, so constructed that it may be readily adjusted to plow deep or shallow, or to turn a wide or a narrow furrow, and may be easily raised from and lowered into the ground. The cutter is rigidly connected with the axle, so as to be entirely independent of the plow, and so as to be held firmly to its work.

Improved Gang Plow.

Finley R. Crothers, Sparta, Ill.—This improved gang plow is so constructed that the plows may be readily adjusted to cut wide or narrower furrows. The tongue may be moved toward either side, to adjust it for three horses while keeping it parallel with the line of draft, and without moving the line of draft from the center of the machine.

Improved Car Coupling.

Theo. T. Spotwell, Osage, Iowa.—This invention relates to means whereby great simplicity, efficiency, and economy are imparted to the ordinary car coupling, by dispensing entirely with the complication of parts now in use and combining a coupling pin and crank shaft so that the former is held up by a weight or spring, yields to the pressure of an incoming link, and rises to lock the link as soon as the latter has ceased to bear upon it.

Improved Bolt Heading Machine.

James and John Kennedy, Plainville, Conn.—This invention consists in several important changes in the ordinary machines for making square necked bolts, whereby the machinery is simplified and rendered less liable to accident, while much greater uniformity and excellence in the manufacture is attained.

Improved Car Coupling.

Daily S. Moore, Chicago, Ill.—This invention relates to that particular class of car couplings wherein each drawhead is provided with a horn over which the link is passed. The invention consists in novel means for automatically coupling with such a device, and also in means whereby the drawhead may be better adapted to this mode of coupling.

Improved Churn.

Nathaniel Ewing, Houston, Texas.—This invention relates to means whereby the dashers of plunge churns may be speedily, conveniently, and accurately adjusted to the quantity of milk which constitutes the churning at any one time, and also whereby a detachable churn itself may be easily and securely fastened to a frame just previous to the commencement of the churning operation.

Surfacing Sheet Iron to Resemble Russia Iron.

John Stackhouse, Allegheny, Pa.—The sheets of ordinary iron of good quality are placed in packs of four sheets, and immersed in a solution of oxalic acid and water. When the iron is heated, the water evaporates, leaving a slight film on the surface of each sheet of iron, which is converted into carbonic acid gas. This gas combines with the iron, and hardens the surface. The surface of the iron is, consequently, left clean, and takes a high polish when sheets are rolled, the iron resembling the best quality of Russia sheet iron.

Improved Water Wheel.

John W. Ross, Delphos, Ohio.—This invention relates to a turbine wheel in which the buckets are arranged to admit the water at an angle of ninety degrees, between a horizontal and a vertical line. The buckets are formed at the upper end on the inner curve of this dome-shaped chute rim, and they are concaved in cross section on a radius a little smaller than their breadth at the top. From the top they widen downward, so that from the quarter circle of the top they increase to nearly three quarters at the lower end, where, by their spiral curve, they come to the form of an upright trough, from which they discharge the water directly downward. By this curved or dome-shaped form of the chute rim and the upper end of the buckets, combined with the concave shape of the body of the buckets, the water is delivered to the wheel, flowing direct and in solid columns, in which it is most effective.

Improved Corn Dropper.

Richard Peter Montague, Whitley's Point, Ill.—The frame of the device consists of two side bars and two cross bars framed to each other. To the axle is attached a cylinder, in which is formed a zigzag groove, the sides of which are concaved to receive the ball pivot, which revolves upon a bolt attached to the end of a lever, so that the said lever may be oscillated by the advance of the machine. The lever oscillates upon a long bolt, upon which is placed a coiled spring, which holds the said lever down to its place, and the elasticity of which allows the lever to move up and down upon the bolt as the device changes its position in passing over uneven ground. The forward end of the lever is pivoted to the dropping slide of the planter.

Improved Harrow and Cultivator Teeth.

Stephen J. Nason, South Berwick Junction, Me.—This invention consists in a double harrow tooth, pivoted so as to be self-adjusting and self-sharpening. The teeth are made double, and the working parts are made in the shape of right angled triangles, placed with their inclined sides forward. The triangular parts are parallel with each other, and are connected at their upper edges by a plate, which is pivoted at its forward part to the harrow frame.

Improved Damper.

Matthew Howles, Hamilton, Canada.—This invention consists of a damper which is weighted at one side, and provided, at the outside of the pipe, with a notched disk keyed to the projecting end of the shaft. A sliding bar is guided in a case above the disk, and engages the notches of the same, so that the damper is retained securely in any desired position thereby.

Improved Seal Dip.

Benjamin F. Reinmund, Lancaster, Ohio.—This invention relates to and consists in means by which gas may be transferred from the retorts to the condenser or gasmain, with great facility, dispatch, and convenience.

Improved Washing Machine.

George A. Newell, Wilmington, and John N. Stallings, Kenansville, N. C.—As the water boils, it is forced up the sides of the boiler and clothes holder, and through holes upon the clothes, which will soon become saturated. The squeezer, as it vibrates, expresses this water, which serves as a vehicle for carrying dirt into the bottom of the chamber, from whence it will flow back, through covered holes, to the boiler. This is continued until all impurities are eliminated from the clothes.

Improved Sewing Machine.

Silas H. Hall, Ottawa, Kan.—The needle has its shank flattened on one side, the socket being of corresponding form; and a notch, in the side, receives a slide to hold it from dropping out when the set screw is loosened. The detachable bead holds the needle so as to oscillate it a little, to adjust and line the eye properly. A set screw, for fastening the needle in the head, passes through a slot in a spring, hanging down from the needle bar, and prevents the head from turning too far. There is a clamp and a thumb screw, for fastening the presser to the presser bar by securing a stud on the presser in the eye of the bar, so that the presser may be changed without the use of a screw driver. There is a horizontal slide in a groove, in the side of the stationary arm, with a stud pin, which enters a curved cam slot and operates the needle arm. The slide is worked by a crank on the top of a vertical shaft, which is to be turned by a disk running against the driving wheel, to be turned by friction.

Improved Center Piece and Cover for Cooking Stoves.

Mary L. Melville and John S. Kidd, Brooklyn, N. Y.—It is proposed to construct pot holes in the top plate in clusters with one or more straight sides, according to the number of pots to be clustered together, and thus adjust them so that the whole of the middle portion over the hottest part of the fire will be covered by the pots, having flat sides and standing close together, and all of the available portion of the heat thereof will be utilized. The invention also relates to hinging covers to the stove, so that they may be turned up and rest on the edge by the side of the pot, and thus save the labor of lifting them off and on the stove. The joints or hinges will be on the straight side; and where two or more holes are used, the covers will be jointed to the cross pieces, so as to swing up between the pots.

Improved Wheel and Axle for Vehicles.

Sylvester H. Dailey, Olcott, N. Y.—The wheels which revolve upon the axle are made with wide rims projecting upon the outer sides, and having gear teeth formed upon their inner surfaces. The journals of the axle project upon the outer sides of the wheels, and are squared off close to the body of the said wheels, to fit into square holes in the center of bars, which are placed in vertical positions, and to the arms of which are attached gudgeons, upon which revolve gear wheels of a diameter equal to about one third the diameter of the wheels. The teeth of the lower wheel mesh into a gearwheel which runs upon the journal of the axle, and is formed with a sleeve which extends out nearly to the end of the journal of the axle. Upon the sleeve, close to the wheel, is placed a gear wheel, the teeth of which mesh into the teeth of the upper gear wheel. A spring is coiled around the outer part of the sleeve. By this construction, as the vehicle is drawn forward, the draft applied to the axle will act upon the upper part of the wheels, so that less power will be required to draw the machine than would be necessary were the wheels constructed in the usual way.

Improved Feed Gage for Printing Presses.

John H. Pinks, Woodstock, Vt.—This invention consists of a pair of registering gages for receiving and holding the paper sheets to be printed, mounted on jointed arms which are pivoted to the tympan clamp, and so contrived that they can be shifted to hold paper of any size that can be printed in the press.

Improved Clothes Dryer.

Dennis L. Huff, Bay City, Mich.—There is a disk to which the arms are attached so as to radiate from the center, and by which they are mounted on the top of the post, to revolve horizontally. The said disk is provided with a spindle. This disk covers the socket in the post, and prevents it from filling with snow and water, by which the spindle would otherwise freeze fast in cold weather. To secure the arms to this disk, the ears on the upper side at the edge and the boss at the center are provided, and a hole is made through the ears and others through the boss, coinciding with them radially, descending from the ears to the center of the boss. On the under side of the disk are strengthening ribs, which unite in the spindle at the center. The post has strengthening ribs and a strengthening collar around it at the bottom of the socket, where it is subject to the greatest strain by the spindle.

Improved Cotton Press.

John Gramelspacher, Jasper, Ind.—The follower is attached to the cross head, and both are worked by rods. The latter are operated by levers and cramping pawls. There are also griping pawls for holding the rods while the griping pawls let go. The cramping pawls are connected to the levers by a yoke, and they have a spring under them for throwing them up, so as to release the gripe on the rod; also to raise them for taking hold again as soon as the levers let go. The pawls are coupled to the frame by the link, and held by a spring, so as to gripe the rods and hold them against going back. A yoke is provided with each griping pawl to hold it down against its spring and prevent it from griping when it is desired to raise the follower. Bars are attached to the two sides of the press case, with holes at the slots in the sides of the case, to introduce rods above a quantity of pressed material, not enough for a complete bale, to prevent it from springing up while the follower is raised to press in another portion.

Improved Barrel Head.

Owen Judge, Carbondale, Pa.—The head of this barrel consists of four pieces: two principal pieces which are so much less than semicircles that they may be crowded from the middle to the right and left into the croze, and two short pieces of sufficient width to complete the head, but connecting and lapping at the center. The inner edges of the principal parts are beveled. The smaller pieces are beveled to fit this space, so that when their outer ends are placed in the croze, and they are forced down by the central bolt, they act like a wedge to press the parts laterally, while making tight joints with them in the middle of the head. A nut plate is firmly attached to the center of an anchor piece. Into this a lock is screwed which forces down the pieces to a level and forms a tight head.

Improved Gas Regulator.

Jules Anselme Crété, Corbeil, near Paris, France.—This is a regulator for gas and other fluids, in which a ball is confined in a tube, through which the fluid passes, and rises or falls as the pressure is greater or less, thus obstructing the delivery. The apparatus consists of a chamber fitted on the gas burner, the water pipe, etc., and formed at its upper part with a central channel of definite section, on the inner surface of which grooves or recesses are formed, which increase the sectional surface thereof. The number and section of these grooves or recesses is so calculated that, supposing the central channel to be obstructed, there will pass through the grooves (which constitute so many distinct passages leading to the burner proper, or to the water outlet) only a desired quantity of gas or water; or, in other words, the regular delivery. The lower part of the central channel is conical, and the body of the regulator is so set that when the delivery of gas or water is shut up, a small sphere rests on a seat at a certain distance beneath the cylindrical portion of the channel or passage. The seat consists of two or three pins, which retain the sphere above the center of the inlet pipe without closing it completely, leaving around the same free passages, while the space between said seat and the grooved channel forms a case or chamber, into which the sphere can rise. The operation is as follows: The delivery cock being shut, the sphere stands resting on its seat. If, now, the cock is opened, and the pressure is superior to two fifths of an inch, the sphere then will rise, and, getting near to the conical part of the central channel, will give access to the burner of only the quantity of gas passing through the grooves in said channel and the annular section existing between said sphere and the channel surface. Should the pressure increase, then the sphere will narrow more and more the annular space, so far as to completely annul it, and the gas will then escape only through the grooves, which are adapted for delivery of a volume of gas sufficient for the normal consumption of the burner. When the pressure subsides, the inverse effect will be produced, the sphere lowering and thus increasing the escape section. When the pressure gets beneath two fifths of an inch, the sphere will drop again to its seat, and the gas will escape through the entire channel and its grooves.

Improved Pocket Book.

Daniel M. Read, New York city.—This invention consists in an improved fastening for pocket books, etc., in which a part of the main plate is movable, and has teeth formed upon its inner edge to take hold of the catch attached to the flap of the pocket book. The sliding part has an arm, the ends of which overlap the plate to keep the said part in place. The sliding part is moved back by a knob to unfasten the catch, and is connected with the end of the arm by a pin which passes through a slot in the plate. The sliding part is held forward by a spring.

Improved Artificial Stone.

Ernest L. Ransome, San Francisco, Cal.—This is an improved process for indurating and removing the excess of moisture from artificial stones by the aid of heat and moisture. If the stone contains soluble silica, it is first immersed in a solution of any of the compound silicates. The maximum temperature of the solution should be about 212° Fah. When the stone has been subjected a sufficient length of time to the action of this bath, the stones are removed and placed in a separate vessel. The stones are next surrounded with an atmosphere of about their own temperature, which is moistened by steam, the object being to obtain a greater quantity of moisture in the atmosphere surrounding the stone than would result from the conversion of the moisture in the stone to steam. After maintaining this moist atmosphere at a temperature long enough to convert the moisture in the stone to steam, the amount of moisture is gradually reduced, while carefully regulating the temperature. Artificial stone which does not contain soluble silica need not be subjected to the hot bath, but will be seasoned and indurated by being subjected to the moist atmosphere and subsequent dry heat. By the above described process the surface of the stone is speedily indurated, while heat and moisture are conveniently conveyed to the mass, and by the use of the atmospheric treatment the obnoxious surface cracks, consequent upon variable shrinkage of the mass, and so frequently met with in artificial cement stones, are prevented.

Transparent Fluid Compound for Engraving Purposes.

Frederick Diffany, Newark, N. J.—This compound is used for engraving with the sand blast when a large surface is required to be cut away, such as in bracelets, watch cases, etc., for example. When it is desired to ornament a bracelet, the pattern is drawn with the compound, and such portions covered as may require to be left untouched by the action of acids or the sand blast. The piece of metal thus prepared is set aside for a few hours until the compound stiffens, when it is ready to be treated with the sand blast, which will rapidly cut away all such parts left uncovered. The compound is composed of benzine, ether, spirits of turpentine, india rubber shellac, dragon's blood, mastic gum, and alkanet.

Improved Medical Compound or Salve.

James W. Miller, Leesburg, Tenn.—This invention consists of a compound composed of slippery elm bark, the plant known as life everlasting, mullein tops, and pure spring water. These ingredients are boiled down, then beef tallow, mutton tallow, English rosin, beeswax, and neat's foot oil are added. By this method a healing salve is produced, which is a remedy for all descriptions of sores, wounds, bruises, etc.

Improved Piano Stool.

George A. Ramseyer, New York city.—The standard, which is supported at the ends in the cross bars of the stand, has the nut fitted on it. The nut is provided with the branching arms, which extend above the upper cross bar and support the seat sufficiently above it to allow the necessary play for it to be adjusted to vary the hight. A friction pawl holds the seat, by binding the nut on the standard, and is so arranged that the downward pressure on it by the standard causes it to gripe the standard and bind it fast. By lifting the seat up, the gripe of the pawl is destroyed, and the seat may be raised without manipulating the pawl, but to lower the seat the pawl has to be held away from the standard. The seat may thus be adjusted much quicker than with a screw, and without revolving it.

Improved Manufacture of Friction Matches.

José J. Machado, Havana, Cuba.—This invention consists of the preparation of the matches with a composition not liable to ignition, except on a prepared surface of amorphous phosphorus, in such a manner that part of the match is covered with a slower burning composition, while the point or end is prepared with greater affinity to the surface for more rapid ignition. The combustible composition is made entirely waterproof by dipping it into a solution of alcohol and tannic acid.

Improved Driving Rein.

Stillman E. Mathews, Chaska, Minn.—This invention consists of reins or cord connected to them, arranged through the bit ring, around the bit and under the under jaw, from one side to the other, so that the strain tends to gripe the jaw very firmly between the bit and the part passing under the jaw. By this means a powerful effect is produced on the horse, greatly interfering with his running. It is also proposed to connect the reins to the bit ring by other safety straps, to come into action in case the aforesaid cord breaks.

Improved Grain Separator.

Frank Johnson, Fredericksburgh, Me.—To the upper forward part of the shoe is attached a board upon which the straw and grain are received from the thrasher. The upper part of the receiving board is stationary, and the lower part may be hinged to said upper part. The lower edge of the lower part is secured adjustably to the shoe. To the adjustable board are attached fingers about three inches apart, and two feet in length, along which the straw slides while the grain drops through. To the shoe below the fingers, is attached a frame, to which are attached short tongues, which enter grooves in the side boards of the shoe, so that the forward end of said frame may be adjusted higher or lower by shifting it from one to another of said grooves. The rear end of the frame is supported by bolts, which pass through the shoe. To the side bars of the frame are attached cross slats, which are arranged one inch apart, and the forward edge of each rear slat one half an inch below the rear edge of the next forward slat. To their rear edges are attached wires about one quarter of an inch apart, and which project about four inches. The forward edges of the slats are made thicker and are beveled off, so as to allow the grain to pass through, and also to give the blast of air a proper direction to blow off the chaff.