iron plates. As a practical result of his investigations, his brothers, James C. and Edwin A. Stevens, addressed a letter, August 13, 1841, to the Navy Department, proposing, as the idea of Robert L. Stevens, an ironclad vessel of great speed, with machinery entirely below the water line, driving the screw. The armament was to be the heaviest breechloading rifled ordnance, with elongated projectiles, both shot and shell. The usual delays deferred the decision of the government, and the preparation of plans and preliminaries occupied several years; but finally, in 1843, a contract was made, and, in 1854; the keel of the ironclad was laid, and the work progressed intermittently, as changes of plan and of naval administration interrupted it, until Mr. Stevens' death. The vessel as first proposed was to have been 250 feet long, 40 feet beam, 28 feet deep, of 900 indicated horse power, and protected by armor 4½ inches thick. At Mr. Stevens' death he had made a far more formidable vessel. The dimensions, when General McClellan was engaged to rebuild and complete the ship, were: lengtb, 415 feet; beam, 45 feet; depth 22½ feet; and thickness of armor proposed, 6¾ inches. The power of the machinery was estimated at 8,624 horse power, and her twin screws were to drive the vessel twenty miles an hour. The vessel was in this form at the commencement of the late war, but without armor or armament. The Navy Department appointed a board to examine the vessel, the majority of which board after, as claimed by Mr. Stevens, a cursory inspection, reported against completing the vessel, except on terms unsatisfactory to Mr. Stevens. Professor Henry, in a minority report, urged prompt completion and her employment against the enemy. It is difficult to imagine what good work might not have been done had this powerful vessel been placed in our fleet, as might have been done, early in 1861. Mr. Stevens obtained for his vessel favorable professional opinions from the most distinguished engineers and shipbuilders in the country. R. L. Loper, Samuel Harlan, Jacob G. Neafie, Theodore Birely, Washington Jones, Erastus W. Smith, and Meirs Coryell, all of whom were acknowledged as the best authorities in the country, endorsed Mr. Stevens' plan; but the vessel was still looked upon without favor by the government. No generally acknowledged authority on the subject seems to have had influence against the ship; yet, notwithstanding the exigencies of our civil war, she was allowed to remain idle upon the stocks.

After his death, the brothers of Mr. Stevens continued the effort to obtain the completion and acceptance of the vessel, with no greater success. Commodore Goldsborough presented a somewhat ambiguous report, advising completion and trial before purchase, and the distinguished present Chief of the Bureau of Steam Engineering reported favorably as to the machinery, which was the vital portion of the plan.

Finally, Mr. Edwin A. Stevens, who inherited the property of his brother, died, leaving the vessel to the State of New Jersey, and appropriating a million of dollars to complete her. The executors, in accordance with the known desire of the testator, appointed General McClellan as engineer to carry out the provisions of the will.

Under the direction of General McClellan and his assistant, Mr. Isaac Newton, the ship was completely rebuilt and new machinery constructed; and the vessel was converted into a monitor. The funds, however, proved insufficient to complete the vessel on the new and elaborate scale proposed, and, at last, work was stopped. A question arose as to ownership, and the State Legislature directed that the vessel be sold as she stands, and the proceeds paid into court.

The commission appointed to effect the sale, Governor Parker, Vice-Chancellor Dodd, and Mr. Stevens' executors, have now employed Professor Thurston as their consulting engineer, and have issued a pamphlet containing his report, in which the vessel and machinery are minutely described, and the calculations of strength, of speed, and of other important particulars are given at considerable length. The pamphlet is beautifully gotten up and is illustrated by drawings of the vessel and machinery, and views of the premises where the ship now lies. From this book we learn that the vessel is intended to be made a turreted ironclad, as here illustrated. She has a greater displacement than has any vessel in our navy—over 6,000 tuns. She has four main engines, is 6 feet in diameter of cylinders, and of over 6,000 horse power. The details are shown to have great strength, and the journals to have ample bearing surface. The drawings show the lines of the vessel, and the engines are shown in plan and in side and end elevation. The boilers are of immense size, having 876 square feet of grate and 28,000 square feet of heating surface. Air is supplied by several large blowers which force it into the airtight fire room. The sides are to be protected by armor 10 inches thick, while the turret, 16 or 18 inches thick, can protect the heaviest ordnance in the world. The speed is estimated, on the basis of ordinary everyday performance, at 16½ knots as a maximum. Could the apparently unusually favorable conditions of the case be relied upon with certainty, Professor Thurston informs us, the speed would become not far from 20 miles an hour. The estimates of speed are made in several different ways, that usually considered most reliable—Professor Rankine's method—giving highest results. The slip of the screws, in consequence of their great area, is calculated at but 9 per cent, and this will effect considerable economy of power. At 16 knots the vessel will steam 109 hours, on 800 tuns of coal, making a run of 1,744 nautical miles. At 6 knots, she will steam 30 days and 5,256 miles. As a merchant steamer, carrying 1,600 tuns of coal, she would go from New York to Liverpool in 8 days, or to Queenstown in 7½ days, with favoring winds and smooth sea. As a steam ram, she would strike a blow of 60,000 foot tuns energy, which is equal to the concentrated impact of eight or nine British 600 pounder rifles, of six 20 inch Rodman shot, or of four of the 81 tun rifles recently designed for the British navy.

We give overleaf a view of the vessel as she lies in dry dock at Hoboken, not far from the Stevens Institute of Technology. Our advertising columns contain Professor Thurston's advertisement, which gives the main dimensions. We are indebted to that gentleman for many of the interesting particulars which have been given above.

The vessel is to be sold either as an entirety or in detached parcels, in November next, and the public, as well as naval men and engineers, will await the result with interest. It would certainly be sad if a splendid ironclad vessel, upon which millions of dollars and a vast amount of the finest engineering talent ever known had been expended, should go into the scrap heap because of the indifference of our own Navy Department, or in consequence of the reluctance of officers to trust their own judgment when the value of the vessel is so plainly shown them. It would be even more unfortunate if the superior intelligence or enterprize of some foreign government should add the fastest ironclad in the world to a foreign navy, where it may at some time act against what miserable remnant of a navy we may then still retain. Should it seem probable that such may be the case, it is to be hoped that some public spirited citizen may buy her and present her to our impecunious Navy Department.

A New Refrigerating Process.

A new process of refrigeration, adapted to the preserving of food, has recently been devised by M. Tellier, a French civil engineer. It consists in maintaining, in the receptacle in which the material to be preserved is placed, a temperature of from 30° to 32° Fah., in order to produce which the condensation of methylic ether is employed. This ether is gaseous at the ordinary temperatures, but liquefies at —22° and distils at +5·8° Fah.

The apparatus principally consists in a cooler, in which the ether is placed. The vapors of the latter, which escape at a tension of about 1½ atmospheres and at the temperature of 58° Fah., are compressed in a condenser at 6, 7 and 8 atmospheres. They then liquefy, and are returned to the cooler, so that there is a constant circulation.

The cooler resembles a tubular boiler, since it is traversed by a large number of tubes. The ether is placed in the body of the vessel, and a solution of chloride of calcium is pumped through the pipes, and thence, becoming cooled, is led through the receptacle in which the meat, etc., is contained. The effect of the intensely cold liquid current is to cool the air in the chambers to the freezing point of water, when watery vapor and atmospheric germs become deposited in the form of hoar frost. The solution is then conducted back to a reservoir, and thence through the cooler pipes again. A committee from the French Academy of Sciences, deputed to examine this invention, speak of it very highly, and state that meat thus kept for months, and subsequently cooked, was found to be in perfectly fresh condition.

Compressed Gun Cotton.

A series of experiments is in progress at the Royal Arsenal, Woolwich, Eng., with a view of further elucidating some of the various attributes and characteristics pertaining to compressed gun cotton. Interesting facts as to the extraordinary rapidity of detonation of gun cotton were brought to light about a year ago. It was ascertained that this was unprecedented, the swiftness of the action being marvelous; indeed, with the exception of light and electricity, the detonation of gun cotton traveled with greater rapidity than anything we are cognisant of. Thus, detonation would take place along a line of compressed gun cotton disks, placed so near as to touch each other, with a velocity only inferior to that of electricity or light, igniting a charge or conveying a signal, if desired, almost instantaneously; 20,000 feet, or nearly three miles per second, was calculated to be the rate of transit, according to Noble's electro-chronoscope. A powder quick match of the most delicate construction ignites so leisurely that the process can almost be observed with the eye. Now, comparing the velocity of detonation of gun cotton with someother speeds, we find that it is eighteen times greater than that of sound, fifteen times greater than that of a rifle bullet and actually one hundred and eighty times superior to that of the swiftest express train. One important characteristic in the detonation of compressed gun cotton is its power of self-transmission, unimpaired in violence and vigor of action, through a continuous train of disks. It is carried on from one disk to another, each in its turn being acted on by its neighbor behind, and setting up a similar action on its neighbor in front.

The present experiments are to determine the relative effects of the detonation of various classes of gun cotton, nitrated and common, when performed in the open air. A "crusher gage" has been employed. It consists of a cast iron body with an orifice at the top, into which a socket is screwed. Within this a piston works up and down, which is recessed around for packing. Pellets of copper are placed upon an anvil beneath the piston, and they are kept in position by a little india rubber washer placed around them. The crusher gage is then securely screwed to a large wrought iron plate at its three corners. The pellets employed are cylinders of copper ½ inch high, diameter 2·306 inches, and area, $\frac{1}{12}$ inch. The means adopted for determining the amount of pressure exerted upon the piston by the shock of an adjacent explosion are by measuring, with a delicate micrometer, the extent to which the pellets are compressed. Several 5 lbs. charges of compressed gun cotton were detonated, each at about a foot's distance from the crusher gage, and in the open air. In some instances the compression of the copper pellets was equal to 8½ tuns per square inch.

The concussion given to the air, then, by the detonation of a large mass of gun cotton must be simply prodigious. But we were prepared to find that it was extreme from observations taken during experiments recently instituted at the Arsenal with disks of gun cotton detonated upon wrought iron slabs, 1⅛ inches, 1¼ inches, and 1½ inches thick. Although loosely placed upon the slabs, with only a light tamping of sand over them to keep the detonating fuze in position, and not in any way confined, upon firing the charges, consisting of ½ lb. compressed gun cotton, the slabs of iron were split into fragments. Moreover, a band of disks placed around the trunk of a large tree at Upnor, and detonated, severed it instantaneously as though felled by a single blow from an ax.—*The Engineer.*

DECISIONS OF THE COURTS.

United States Circuit Court---Southern District of New York.

PATENT BRACELET.—BARCLAY AND KNAPP *vs.* THAYER AND CUSHMAN.

Blatchford, Judge.

This suit is brought on reissued letters patent granted to John Barclay, December 6, 1870, for an "improvement in the manufacture of plated metal bracelets," the original patent having been granted to him as inventor August 24, 1869.

This patent bracelet is constructed by turning over the two edges of the under plate until they rest on the base metal, and form a bead on each side, and then fastening by solder between the beads the edges of a single outer plate, so bent that a section of it is the form of an inverted U. Held by the court (Judge Blatchford) that this is the subject of a valid patent, although a previous patent covered a bracelet with its under plate of a similar form, but which was completed by sliding bits of metal with projecting lips under the beads.

[*J. Van Santvoord*, for the plaintiffs.
Carroll D. Wright, for the defendants.]

United States Circuit Court.---District of Massachusetts.

PATENT ALPHABET BLOCKS.—SAMUEL L. HILL *vs.* J. T. HOUGHTON.

[In equity.—Before Clifford and Lowell, Judges.—Decided May 30, 1874.]

Lowell, Judge.

Placing the letters of the alphabet upon cubical blocks of wood, or spelling blocks, having been practiced many years, and also placing two such letters upon some of the blocks, it is not patentable to place two or more upon each block, even if they are placed more systematically, and with the design of rendering the blocks more useful.

Letter blocks with pictures upon some of their faces do not infringe upon a patent for such blocks with figures upon some of their faces, by which they can be selected in accordance with a key accompanying them, so as to spell particular words, such blocks with pictures having been long known.

Bill dismissed.

[*J. Van Santvoord*, for complainant.
A. A. Ranney, for defendant.]

NEW BOOKS AND PUBLICATIONS.

IMPROVEMENTS IN STEAM ENGINES. By John Houpt, Pennsylvania. With Diagrams. Philadelphia: J. B. Lippincott & Co.

Mr. Houpt has invented and patented a long list of improved steam engine details, and he here reprints, in pocket book form, the specifications and drawings thereof.

EL ATENEO. $6 a year, 50 cents a number. Office, 31 Park Row, New York city.

This is the title of a new and beautiful monthly periodical, in the Spanish language, the first number of which is before us. Its contents include literature, the arts and sciences, each department being copiously illustrated with plates or engravings, while the general typography is most excellent. Taken altogether, it is a very beautiful publication, full of interesting and valuable information. We trust it may have a very wide circulation.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From June 19 to July 26, 1874, inclusive.

BARBER'S CHAIR.—W. M. Golden (of Brooklyn, N. Y.), London, England.
BEARING, JOURNAL BOX, ETC.—W. W. Crane, Auburn, N. Y.
BUTTON AND FASTENING.—D. Heaton, Providence, R. I.
CARD FASTENER.—J. H. Small, Buffalo, N. Y., *et al.*
CHANGING COSTUMES.—J. Morris (of New York city), London, England.
GAS BURNER.—A. T. Welch, Brooklyn, N. Y.
GAS ENGINE.—G. B. Brayton, Boston, Mass.
GAS MANUFACTURE.—W. Harkness, Providence, R. I.
GUANO BAG, ETC.—B. R. Croasdale (of Philadelphia, Pa.), London, Eng.
HOLDING AND PUNCHING TICKETS, ETC.—J. H. Small, Buffalo, N. Y.
INKSTAND.—B. Brower, New York city.
LAWN MOWER.—D. Williams, New York city.
LUBRICATING COMPOUND.—B. French, Rochester, N. Y.
MAKING FISH NETS.—B. Arnold, East Greenwich, R. I.
METALLURGICAL FURNACE.—S. P. M. Tasker, Philadelphia, Pa.
PULLEY HUB.—W. W. Crane, Auburn, N. Y.
REAPER AND MOWER.—W. N. Whitely, Springfield, O.
REFRIGERATOR.—J. J. Bate, Brooklyn, N. Y.
SOLDERING PIPES, ETC.—W. A. Shaw, New York city.
SURFACING TEXTILE FABRICS.—W. Bell, New York city.
WHARLE TUBE FOR WOOL SPINNING MACHINES.—J. C. Wellens, Phila., Pa.

Recent American and Foreign Patents.

Improved Screw Driver.

James A. Wakefield, Minneapolis, Minn.—This consists of a combination of a screwdriver and one or more countersinks or other similar tools. When the screw driver is in use, the countersinks are drawn back toward the brace, with the backs in contact with the screw driver. When a countersink is required, it is turned on a pivot pin, as on a hinge, to the proper position. A small slit in the back of the head of each countersink receives the end of the screwdriver. The faces of the countersink are fitted to the sides of the screw driver, and the screw driver turns the countersink as it would turn a wood screw.

Improved Combined Wheat Scourer and Cockle Extractor.

Lourens Arentsen, Gibbsville, Wis.—In using this machine the wheat flows from the hopper into a cylinder, where it is cleaned from dust and other substances that may adhere to it. If the wheat is free from cockle, a sleeve is adjusted to uncover the hole through a partition and allow the wheat to pass through a tube or spout to the wheat spout, where the dust is withdrawn through the spout by the air blast. If the wheat contains cockle seed the sleeve is adjusted to close the hole in the partition, and open other holes, allowing the wheat to pass into the space between a screen and cone. As the wheat passes down through the said spaces, the cockle seeds enter the recesses in the screen, where they are held by the pressure of the air, which passes in with the wheat and through the openings in a ring plate. As the cockle seeds come opposite openings between the parts of double threads between cylinder and screen, they are forced through said openings by the current of air passing through the holes in the screen, and through the said openings between the parts of the threads as it makes its way through the spout to the fan. The cockle seeds drop through the interior of the cone to the air spout, whence they escape through the valve door.

Improved Plow.

William Warinner, Creelsborough, Ky.—This is an improved plow for loosening the subsoil around small plants, and at the same time throwing soil around them, which may be readily adjusted to throw less or more soil around the plants, as may be desired. The essential features are the adjustment of the wings for the last mentioned purpose and the arrangements for strengthening and supporting handles and beam.

Improved Corn Planter.

William A. Watkins, Culleeka, Tenn.—This invention is an improvement in the class of seed planters whose hopper slide is vibrated or reciprocated, by means of arms or other projections on the inner side of the transporting wheels. The essential features are rectangular or polygonal plates, pivoted in the ends of a platform, the seed slide, and the blocks attached to the wheels, which are fast on the axle, all constructed so that the slide is reciprocated and its movement arrested by the pivoted plates in alternate succession.

Improved Sewing Machine Table.

Elias R. Clark, Marshfield, Ind., assignor to himself and William L. Hamilton, same place.—This invention consists of a table top, to which the sewing machine is connected, which is detachable from the top of the stand, and a sliding top for said stand, contrived in a peculiar and simple manner, to take the machine off the stand, when not in use, and inclose it within the case under the sliding top; and when it is in use, to adjust the sliding stop so as to be used as an extension of the top of the machine.

Improved Lamp for Heating.

James Iredale, Toronto, Canada.—There is an adjustable frame outside the wicks for regulating the flame, which frame is raised and lowered by means of the arms on a shaft. The arms enter holes in the flanges of the frame, and the shaft is turned by means of a thumb piece. A strip of metal is arranged diametrically in the mouth or top of the air tube for the purpose of dividing the air current, and diverting it laterally to the wicks. See illustration, page 38, present volume.

Improved Revolving Scraper.

Wilkins J. Webb, Butler, Ill.—The scraper is of semicircular form, having circular heads, and is attached by means of gudgeons in the center of the heads, with suitable bearings in a frame. The tongue, which is hinged to the cross piece of the frame, is adjustable as to hight. The position of the scraper in reference to the frame is governed by a long lever, which extends back over the scraper, and is controlled by the attendant who walks behind. Pins come in contact with catches when the scraper is filling; and when the scraper is loaded, it is prevented from revolving by by the pins and catches, until the load is conveyed to the desired location to be dumped. When this point is obtained, the catches are thrown from under the pin by turning a rock shaft, which is done by drawing back a lever. This allows the scraper to revolve and deposit its load, and then to serve as the wheels of a cart in moving it back to its work.

Improved Method of Facing Porcelain-Lined Vessels.

John C. Milligan, South Orange, N. J., assignor to Lalance and Grosjean Manufacturing Company, New York city.—It has been the custom, in the manufacture of porcelain-lined ice pitchers and the like, to inclose the porcelain-lined bowl or pot in an outer shell, plated on the outside to obtain the necessary exterior finish. Hence two bowls or pots have been used when one would answer as well, provided its exterior surface could be properly finished. This the present inventor has succeeded in doing by plating the iron pot with a heavy coat of tin, or copper, or other cheap metal, by the battery process, after it has been lined. The surface is then brushed with strong revolving brushes to level down the high places and fill up the low ones. Smoothing and burnishing follows, and afterward plating the tin, copper, or other cheap metal used for the preparatory coating, with the finishing coat of tin, silver, or nickel, thus obtaining a smooth and even surface.

Improved Draft Equalizer.

Josiah Dodge, Grass Valley, Cal.—This is an improved double tree, so constructed as to give the horse which may get in the rear of the other and which is generally the weaker or slower, an advantage of leverage, so that he may be able to get even with the other horse while both horses are exerting their full strength, and without its being necessary to check or old back the forward horse. The invention consists in the arrangement the bolt or hammer hole of a double tree in the rear of its axis, and in e iron strap or plate attached to the rear edge of the double tree to sustain the draft strain.

Improved Anchor.

Alphonso H. Cobb, Detroit, Mich.—This anchor has a joint in the shank, near the arms. The latter, the flukes, and the stock are all turned in the same plane. It is claimed that the anchor will hold in whatever position it is dropped. The stock can be laid parallel or detached; the arms may be laid parallel, or, by taking out the pin, the parts may be separately stowed or shipped, and afterward joined with but little trouble.

Improved Pen Holder.

George W. Jolly, Knoxville, Iowa.—There is a clip in the shape of a truncated triangle, two sides of which are bent in tubular form. Through one tube passes the pen holder, and through the other a guide staff. The plate is formed on the angle necessary to give the inclination of the guide staff required for carrying it forward of the pen sufficiently to control the hand properly and hold the pen in proper position. The staff slides up and down in the clip to regulate the extension of it below the point of connection of the pen holder to suit the particular case in hand. A ring on the holder is slipped on the fore finger as near to the upper joint as may be, and the staff is placed between the second and third fingers below the pen holder, and over the thumb above the holder, for using the apparatus. The essential effects of the attachment are: holding the hand up to the proper level; holding the fingers so as to compel the movement of the fore arm to work the pen; and keeping the wrist off the paper, so that the arm only rests upon the table on the muscle or fleshy part a little forward of the elbow.

Improved Bob Sled.

William L. Moshier, Mauston, Wis.—The cast iron knee, which rests on the top of the runner, is held in place on the runner by long bolts, extending from the shoe of the runner up on the top of the rave, along grooves in the sides. These grooves it is proposed to make wider, from the bottom upward for a short distance, than the bolt, so that the foot may shift a little laterally when the sled lurches heavily, and thus ease the effect on the bolts. The runners also are arranged to rise up at the front end independently of each other, to pass over objects or irregular ground without straining the joints.

Improved Cultivator.

Alexander P. Carnagy, Summer Bridge, Del.—The upper ends of the teeth are inserted in sockets, attached in proper positions to the under side of the beams, where they are secured in place by the wedge bolts, which are inserted in the cavity of the teeth, pass up through the beams, and are drawn up into place and held by nuts screwed upon their upper ends. By this construction the teeth will be firmly held, and at the same time may be readily detached when desired.

Improved Telegraph Key.

Randall W. Walker, Oxford, N. Y.—This is a combined telegraph key, by which a dispatch may be sent over two or more lines at the same time, or over one or more separate lines, as desired. The invention consists of a telegraph key made of as many insulated plates as there are lines to be worked, which plates are provided with sidewise projecting lugs for attachment to the connecting wire. Any one or more lines may be worked separately for transmitting dispatches by cutting the remaining wires out by circuit closers.

Improved Car Ventilating Apparatus.

Henry A. Gouge, New York city.—The inlet devices are placed at the alternate angles of the car. Each is made in two parts, with funnel-shaped mouths, the mouth of the one part being forward, and that of the other part rearward. The parts of the device unite into a single tube, which passes down through the roof of the car, and its upper part is divided into two passages, one for each mouth, by a partition, which extends a little below the roof. In the sides of the car, just below the roof, are formed openings leading into the tube. By this arrangement, as the car moves in either direction, the air passes in through the forward mouths of the devices, and passes down through the tube, which induces a strong current of air through the openings. Suitable arrangement enables the air to be heated before being introduced into the car; and by other devices, the forward movement of the car will induce an upward current of air through the device which draws the impure air from the car. By this construction also, a downward wind cannot blow into the car, but will only induce an upward draft through the device.

Improved Glove Fastening.

Isaac Hermann, New York city.—Each button is made of an upper plate and a lower plate, which are connected through a small perforation of the glove by means of a central screw bolt of the top plate, turning into a threaded socket of the lower plate. The firm position of both plates is secured by prongs of the top plate, which penetrate partly into the leather of the glove, and clamp it rigidly on screwing on the socket plate. The top plate of one button is provided with a small ring, while the top plate of the opposite button has a common or swivel hook soldered thereto. The connecting chain is attached to the hook, passed then through the ring and back to the hook, to be adjusted to the length required. This seems to be a useful improvement over the ordinary glove button or hook, as it can be made in ornamental form of precious metal, and transferred from one glove to another as the articles wear out.

Improved Portable Fare Box.

Henry R. Gillingham, Baltimore, Md.—This invention relates to boxes which are carried by conductors with them through horse cars while collecting the fares from passengers, and consists in certain means whereby each fare will be separately dropped into the box, and a registry thereof made for the inspection of the railroad superintendent, while, at the same time, a gong is sounded to notify and acknowledge the receipt of fare to each passenger.

Improved Harness Saddle Tree and Harness Saddle.

Samuel E. Tompkins, Sing Sing, N. Y.—The first of these inventions consists of the terret nuts, fastened to the back band, in combination with the upper elevated and lower depressed bridges of the tree, instead of being fastened to the upper bridge or to the under bearing plates, as they have heretofore been arranged. The object is to enable the saddles to be made and kept in store ready for sale without fitting on the terret mountings, to allow the purchaser to select the mountings to his taste, also to preserve the mountings better until sold by keeping them in their packages. The invention also consists of an improved construction of the crupper loop, whereby it can be removed at any time and another put in place without removing the filling or middle piece of leather usually placed between the seat and the frame where the crupper loop is attached. The same inventor has also devised an improved method of constructing harness saddles so that the back bands and terret nuts can be readily applied and removed after the saddle is completed, to allow of the application of terret mountings to suit the fancy of the purchaser. In this invention the essential features are a short tree with a bridge extending nearly the whole length of each side, having screw holes in the margin, at the lower end, for use in certain kinds of saddles, for screwing on the under plate from the lower side; also nail holes in the margin of a flat tree for fastening the flap when put on the top side; and also a metal plate attached to the upper end of the back band, having a socket for holding the terret nut, and a covering plate for the socket, to secure the nut without being fastened to the plate by rivets or screws. The covering plate is pivoted at one end to the socket plate, so as to swing forward and back to open and close the socket when the back band is not connected to the saddle, and be kept in place to secure the nut by the saddle when the back band is connected.

Improved Plow Supporter.

Francis M. Shields, Hashuqua, Miss., assignor to himself and John C. Holmes, same place.—The supporter is made of cast iron, with a flange, which receives the shank of the shovel. The under side is hollowed out to fit the stock, and the edges of the hollowed inner surface are provided with a series of points which penetrate the wood and hold the supporter in place. There is a slot hole through the supporter, a bolt which passes through the stock, the slot hole, and the plow, by which means the plow is held firmly to the stock. The slot allows the supporter to be raised or lowered on the stock, so as to fit the share. In this kind of improvement a variety of plows or shares is employed, to adapt it to various crops and soils, varying in form as may be found necessary, and each used as may be required, but all fitting the supporter and fastened in the same manner.

Improved Lathe.

Benjamin B. Ockington and Andrew J. Ockington, Stratford Hollow, N. H. There is a double stationary holder for the blanks in the middle portion of the machine, into which the blocks are dropped on each side behind guards, and upon rests, to be taken therefrom by the lathe centers. Said lathes are mounted on a frame which slides forward and backward on the ways, being actuated by a cam and bar. The lathes are arranged on opposite sides of the blank holder, so that, when one moves up to it, the other moves away from it. In front of each lathe is a shaping cutter, so fixed on the upper end of a swinging frame that, when the blank is moved outward, it will come against the cutter and be reduced to the required shape by it, the cutter being the whole length of the blank, and, after the blank comes against it, moving back with it during the time it operates on the blank, and until the frame carrying the lathes arrives at the end of its movement. The frame carrying the cutter is then engaged by the spring catch and held back while the lathe returns.

Apparatus for Destroying Animal and Vegetable Life.

John M. McGehee, Milton, Fla.—This is a box which is turned bottom upwards on the ground and provided with tubes which enter the latter for a foot. Steam is forced into the device through the top, and its heat kills animal or vegetable life over the surface included.

Improved Process for Baiting and Cleansing Hides.

William Stack, Sussex, Canada.—In a vat containing water is placed bran, oil vitriol, and salt, and in this mixture the skins are allowed to remain for several hours. The skins are next placed in another vat, commonly the one called the pool, with sufficient water to cover them, and tar water and soda is added. This completes the process, and makes the hides ready for the tan liquors.

Improved Carpet Stretcher.

Pulaski Hays, Cool Bank Station, Ill.—The heads are made three feet in length, and have forward edges provided with hooks, upon which the edges of the carpet are hooked to be stretched. The heads are strengthened by braces and have guard blocks attached to their ends, which keep the heads at such distance from the walls that the carpet can be conveniently tacked. To the middle parts of the heads are attached the outer ends of bars. One bar is slotted longitudinally to receive others. The latter bar is made in sections hinged to each other, so that the stretcher may be more conveniently handled. To the upper side of the bar are attached spurs for the engaging end of a pawl to take hold of in applying power to the stretcher. A small block fits into a compartment to act as a pawl to hold the bars in place while the pawl is being drawn back for another purchase.

Improved Car Wheel.

George W. Miltimore, Janesville, Wis.—A tubular bushing has a flange that fits against the outside end of a wheel hub, and also a nut that screws against the other end of a wheel hub, and on the inwardly projecting threaded end of the bushing. Between the tubular bushing and the inside of the hub is located a rubber ring that takes up the shock with great efficiency, while it may be readily applied or removed. In order to prevent the possibility of rotation in the bushing and nut independently of the wheel, a perforation is made transversely through the nut, and at right angles thereto a groove, through the former of which passes an arm, and in the latter of which lies the arm of a right angled key. In the bushing is a slot that receives one arm, while in the hub is an aperture that receives the other. As one arm is in the open slot of that face of the nut that fits against the shoulder of the axle, the key cannot come out unless the wheel is removed from the journal.

Improved Cork Sole for Boots and Shoes.

Edwin A. Brooks, New York city.—Making the cork in two parts or layers prevents the dampness from passing through, however thin or thick the cork may be. A band of sole leather is pasted around the edges of the cork, and is covered with a strip of fine French calfskin. The cover and the upper edge of the sole leather band are sewn in with the upper to the inner insole. To the middle sole, the upper, the lower edge of the sole leather band, the cover, and the welt are sewn by a second seam. The upper is taken up in both seams, which gives great firmness and strength to the sole. The outer sole is sewn to the welt by a third seam in the ordinary manner.

Improved Bridle Snap.

John Kennedy, Osage Mission, Kan.—The shank of the hook has transverse rear slot and circular top flange. The latter fo s a groove n which slides a snap having from its point a sloping-upward extension or thumb piece. This slide is slotted to allow it to move upon the guide pin and against the tension of a spring. The point of the slide is held by the spring against the end of the hook, thus effectually preventing its escape from the bridle ring. By simply pressing the usual iron ring upon the inclined surface of the thumb piece, the slide will recede and allow of the entrance of the ring within the concavity of the hook.

Improved Machine for Raising and Smoothing Panels.

Jacob P. Beck, James F. Shoemaker, and John H. Weaver, Lock Haven, Pa.—Cutters clamped between washers are arranged for cornering or grooving out the edge of a panel at the same time that it is sand-papered. The sand paper is attached to pads which fit in apertures in the same disk to which the cutters are secured.

Improved Boiler Washing Machine.

Franklin H. Biesecker, Cashtown, Pa.—The wash boiler is of cylindrical shape, and on a flange near the bottom is a second false bottom. Below the false bottom, and also near the top, are perforations which are connected by hot water channels tapering from the bottom toward the top for the purpose of discharging the hot water forced up by the generation of steam in the lower part of the boiler with considerable force on the clothes in the upper part. The false bottom has also a central tube through which the water is discharged in connection with a cylindrical cap attached to the under side of the false bottom, and extending to the real bottom of the boiler. The cap is perforated at the side for admitting freely the water, and forming thereby a kind of secondary chamber for developing steam and forcing up the boiling water. The false bottom has apertures closed by valves hinged to the lower side. A rubber block is placed, by its central hollow shaft, over the central hot water tube, the upper solid end of shaft fitting closely into the lid or cover of the boiler. The rubber block placed over the central hot water tube has radial arms and is rotated by a lever handle, keeping thereby the clothes in continual motion and constantly exposed to the action of the boiling water.

Improved Breast Collar for Harness.

George P. Cole, Johnstown, N. Y., assignor to himself, Michael D. Murray, and James F. Murray, same place.—This is a neck strap consisting of an elliptical piece, top piece, bottom piece, and internal spring, the last serving to prevent the breast and neck strap from doubling short in the middle, and also to distribute the pressure evenly.

Improved Dental Coffer Dam Clamp.

Clarkson Bancroft, Brooklyn, N. Y., assignor to Samuel S. White, Philadelphia, Pa.—The jaws of the clamp for griping the tooth and binding the rubber cofferdam upon it are formed on the edges of steel plates about as wide as will allow of applying to teeth of different sizes, and widening each way from the clamp backward a suitable distance for strength. The ends of the outer edges are connected by bow springs, which rise sufficiently high to extend over the top of the teeth; also to allow of introducing the tool under them to work at the tooth if necessary; and they are also sufficiently wide apart to allow of applying the tool between them when necessary. The jaws, springs, and the tongue guard are all made of a single plate of spring steel. The tongue guard is also adapted for holding a small mouth mirror to aid the operator, the mirror being fastened on it by a clamp of any kind.

Improved Machine for Cutting Soap.

Joseph Seibert, New York city.—The object of this invention is to furnish to soap factories an improved machine for cutting large soap blocks into smaller pieces of any required marketable size by the successive operations of the machine without passing any part of the block a second time through the machine. The main frame supports on its lower part the laterally slotted base piece on which the soap blocks are placed for cutting. The cutting wires of the frame are firmly stretched at the required distance by stretching devices, and extend across the base piece in the lateral slots thereof below the surface. The soap block is placed thereon and firmly secured in position by a clamping plate adjusted by a hand wheel and screw at the top of the frame. The horizontal cutting frame is then slowly raised by the hoisting mechanism, dividing the soap block into lateral parallelopipedons until arrived below the clamping plate, which is screwed up to give space for the suspension of the horizontal frame below the top of the main frame. A check pawl secures the position of the frame until detached therefrom for lowering the frame for cutting the next block. The crank shaft is then thrown into gear with the cog wheels of the feeding mechanism, to intermesh with toothed racks, which are guided on suitable friction rollers in longitudinal direction, and firmly applied with their fore ends to socket plates of a follower block, imparting to the same motion in either direction, according as the crank is turned. The follower carries the vertically divided soap block between side guide plates toward the vertical frames. The vertical cutting frames are made up with varying width of wires, to be readily interchanged, according to the size of the pieces to be cut. By forcing the soap block through the vertical cutting frames, the same is cut into the pieces required, which are carried on to a table or platform to be taken off for further storage or use.

Improved Device for Sharpening Stone Tools.

Enoch L. Moore, Steuben, Me.—There is an iron plate on the back of the device to which the other parts are attached, and upon which the movable part of the swage slides. The swage is formed of two parts. The lower and stationary part is placed in a hole in the anvil, and supports the instrument in an upright position, where it is fastened by means of a key. This stationary part of the swage is confined to the plate by a clip. Between the stationary part and the under side of the clip is a forming swage, to upset and give the proper bevel to drills. The movable part of the swage is also kept in position by a clip. There is an opening between the beveled ends of the two parts of the swage in which the tool is placed to be swaged and sharpened. Blows with the hammer are struck upon the end of the movable part, and the chisel or drill is readily brought to the form or bevel of the opening, leaving the sides of the chisel smooth and uniform in shape.

Improved Combined Locket and Smelling Bottle.

Fridrich Wächter, New York city.—The body is divided by a partition plate into two sections, of which one is arranged in the usual manner as a locket with a hinged cover. The other part forms a space around the locket back of the partition plate, and connects, by a top aperture, with a neck, which is provided with a hinged cap having rubber lining for producing the hermetical closing of this part, to be used as a smelling bottle. Any desired perfume may be placed into this space, and the whole device be finished in any desired artistic design and corresponding ornamentation.

Improved Extension Roller.

Wilhelm Valentin, College Point, N. Y.—This invention consists in hinging a series of leaves together and folding them on a larger base leaf, which is applied to a central supporting foot or pillar by a socket plate, so that the pillar may turn therein. A quick screw thread at the lower end of the pillar turns in a female threaded socket with legs, and raises or lowers the leaves, as required. The pillar is placed centrally to the main frame of the table, and forms the support for the table.

Improved Boot and Shoe Nailing Machine.

Lemuel R. Mears, Brooklyn, N. Y.—The object of this invention is to provide a power machine for nailing on the soles of boots and shoes, and at the same time automatically feeding the shoe or boot and supplying the nails. For the nails it is proposed to use the kind made in the form of a long comb, and now used with hand-nailing machines, the nails being connected together by the heads, so as to feed into the machine like a bar, and be detached, one by one, as they are driven. The invention consists of a nail driver and a bender, arranged together in a stock, and geared by rock levers with cams for operating them; also automatic feed mechanism, for feeding the nails to the driver, and also automatic feed mechanism, for feeding the boot or shoe, all so combined and arranged that the nail bar and the boot or shoe feed along simultaneously; and immediately after each feed movement, the bender moves down a little in advance of the driver to adjust the nail to the driving channel, and then the driver moves down and drives the nail into the shoe.