

only file establishment in the country where the steel for the files is manufactured on the premises. Hitherto all the steel that had been used for American-made files was imported from England. It therefore affords us pleasure to make a record of the enterprise of the Whipple File Manufacturing Company.

On page 22, Vol. XIV. (old series) of the SCIENTIFIC AMERICAN, we gave a very full description of the processes and operations involved in the manufacture of files by hand; and we said:—"It seems reasonable that machinery might be constructed to cut files as well, in every respect, as can be done by hand." This opinion has now been confirmed, although at the time it was penned, many practical file-makers with whom we had conversed, believed that a machine could not be made to put the same burr edge upon files, as a skillful hand-cutter. We also said in that article, with respect to the steel:—"Our steel comes from England, while the Sheffield file-makers manufacture their own steel, and are thus enabled to meet rivals in every market in the world. Until we make our own steel (and we do not see why we should not do it), our toolmakers must labor at a great disadvantage in competing with those tools which come from abroad." This suggestion has met with consideration, and the results are indeed gratifying.

#### THE PRESSURE PRODUCED BY GUNPOWDER.

Professor Barnard, of Washington, has communicated to *Silliman's Journal* an article on the pressure produced by burning gunpowder in a cannon, in which he shows that the several experimenters differ very widely in their results; some stating the pressure at 7,000 or 8,000 lbs. to the inch, and others at more than 200,000. Professor Barnard objects to all of the methods pursued by the different experimenters, and then remarks that we finally have an investigation which leaves nothing to desire—the investigation made by Messrs. Bunsen and Schischkoff. These eminent chemists analysed all of the substances resulting from the combustion of gunpowder, and calculated the pressure which they would exert if confined in the space occupied by the powder before it was burned; taking into account the specific heat of the several substances. Professor Barnard remarks that the powder was burned under the pressure of the atmosphere only, and expresses the opinion that the result would not be materially varied by that circumstance.

The best chemists in this city assert, on the other hand, that the burning of gunpowder under the pressure of the atmosphere only, affords no criterion whatever of the effects which would be produced by burning it behind a heavy shot in a cannon. By confining the powder, the heat would be far more intense, and this intense heat would cause an entirely different class of compounds to result from the combustion; thus destroying the foundation of the calculations.

We will also suggest another objection to this investigation. The specific heat of the several products varies with the temperature, and at the high temperature in question has not been ascertained.

Captain Rodman's plan of measuring the pressure of the gases resulting from the combustion of gunpowder in a cannon would seem, at first thought, to be unobjectionable. This plan has been illustrated in the SCIENTIFIC AMERICAN. It consists in boring a hole through the wall of the gun and screwing into this hole a hollow cylinder fitted with a solid piston, the outer end of the piston being of diamond form. When the gun is fired, the pressure of the gas drives the end of the piston into a sheet of pure copper to a depth varying with the pressure. The piston is afterward forced into another piece of pure copper to the same depth by means of a press, the force of which may be measured, and the pressure of the gas is taken to be the same. It has been objected to Rodman's method that the inner end of the piston not being in contact with the powder, the gases would acquire a very high velocity in passing outward through the hole in the wall of the gun, and would strike the piston with a force far exceeding their pressure. It seems to us that there is force in this objection.

Captain Rodman found a pressure, in one instance, as high as 180,000 lbs. to the square inch, and it has been objected by Mr. Fisher, of this city, that such pressure would crumble the cannon to dust—the power of cast-iron to resist a crushing strain seldom if ever exceeding 120,000 lbs. to the square inch. The

reply to this is, that the pressure does probably crush the iron within the scope of its influence; but, as the pressure is only momentary, it is exerted only upon the surface—causing an enlargement of the bore. Captain Rodman says that the pressure ordinarily produced in a cannon would blow the gun to pieces if it were not instantly relieved.

As the objection raised by Professor Seely and Professor Everett to the investigation by Bunsen must be as familiar to that eminent chemist as his A B C's, we cannot help suspecting that there may be some error in our account of his inquiry. It will be seen, however, by an extract in another column, that the President and many Fellows of the Royal Society are of opinion that the subject has never yet been properly and thoroughly investigated. Bunsen's calculation gave a pressure of 65,000 lbs. to the inch, and there is no reason to suppose that his method would make the pressure any less than it really is. We invite the attention of our men of science to this interesting subject.

#### OUR SUBSCRIBERS.

At the commencement of this volume of the SCIENTIFIC AMERICAN we made an appeal to our friends to aid us in extending its circulation. The response to the appeal has been most noble and gratifying; and to all those valued friends we return for their kindness our warmest thanks. Our paper is not large enough to publish the names of all, as we would like to do; we therefore select only those who have taken the trouble to get up large clubs:—

AMERICAN WATCH COMPANY.....	Waltham, Mass.
BASSETT, C.....	Massillon, Ohio.
BELL, J. W.....	St. Louis, Mo.
BLANDY, H. F.....	Zanesville, Ohio.
BRADISH, A.....	Decorah, Iowa.
COOPER, C. & J.....	Mount Vernon, Ohio.
CROSS, C. H.....	Pulaski, N. Y.
DUNNELL, J.....	Pawtucket, R. I.
DUVINAGE, L.....	Owego, N. Y.
FLUKER, F. F.....	Provincetown, Mass.
FOSDICK, S. W.....	Clinton, Mass.
GARST, JOHN.....	Dayton, Ohio.
GOODELL, DeB.....	Elmira, N. Y.
HALTEMAN, A. K.....	St. Louis, Mo.
HAGERMEYER, G.....	Big River, Cal.
HEMINGWAY, H. N.....	Des Moines, Iowa.
HILL, C. F.....	Hamilton, Ohio.
HOLMES, JONAS.....	Clayville, N. Y.
HUBBARD, C. S.....	Whitneyville, Conn.
JONES, WILLIS.....	Bridgeport, Conn.
LATHROP, G. W.....	Weedsport, N. Y.
LYMAN, T.....	Sandusky, Ohio.
MCCONNELL, J.....	Iowa City, Iowa.
MARSTON, F. J.....	Houghton, Mass.
MILLER, E.....	Meriden, Conn.
MOSES, W.....	Buffalo, N. Y.
NEWCOMER, G.....	Meadville, Pa.
NIXON, W.....	Adrian, Mich.
ORAHOOD, H. M.....	Black Hawk, Col. Ter.
REED & CO., G. W.....	Montreal, C. E.
ROBINSON, H. C.....	Monmouth, Ill.
SAGER, M. S.....	Washington C. H., Ohio.
SHORT, W. A.....	Malone, N. Y.
STRUNK, D.....	Janesville, Wis.
THOMPSON, C. B.....	St. Catharines, C. W.
VAN FRIES, H. S.....	Holidaysburg, Pa.
WARFIELD, G. W.....	F to lville, Mass.
WICK, JR., C. B.....	Sharon, Pa.

"Yet," we say, "there is room for a few more." Our subscription list is not quite full; and we appeal again to our many thousands of readers to "follow in the footsteps of their illustrious predecessors."

#### PRESENT STRENGTH OF THE BRITISH NAVY.

The official annual return of the number, name, tonnage, station, and every particular regarding the steam and sailing ships composing the British Navy, together with the horse-power and armament of each, has been published under the authority of the Lords Commissioners of the Admiralty. The total strength of the effective ships of the navy on the 1st of January was 975 of all classes, not including a number doing duty in the various harbors both at home and abroad, the whole of which would be speedily con-

verted into block ships for the defence of the coast, together with a numerous fleet of iron and wooden mortar-boats laid up at Chatham. Of this number there are 72 vessels ranking as line-of-battle ships, each mounting from 74 guns to 121 guns; 42 vessels of from 60 guns to 74 guns each; 94 steamers and other ships, carrying an armament of from 22 to 46 guns each, and the majority of which are of a size and tonnage equivalent to line-of-battle ships; 25 screw corvettes, each carrying 21 guns; and 500 vessels of all classes, including iron ships of great power and tonnage, carrying an armament of from four guns to 21 guns each. Exclusive of the above there is a squadron of 185 screw gunboats, each mounting two Armstrong guns, and nearly the whole of which are fitted with high pressure engines each of 60-horse power. The total number of ships of all classes in commission and serving in nearly every part of the world is upwards of 300, the remainder being attached to the reserved squadrons at the various naval ports, and partially equipped in readiness to proceed to sea whenever their services may be required.

#### RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week: the claims may be found in the official list:—

*Machine for dressing Slate.*—This machine consists of a rectangular frame which may, if necessary, be mounted on wheels for the convenience of transporting or removing the machine from one locality to another. This frame is provided with a fixed knife and also suitable bearings for a lever or sword arm which carries a movable knife. This sword arm is suspended by a spring or springs, so that when in a normal position the movable cutting edge is raised above the lower knife edge, and the two edges resemble a pair of open shears and act in the same manner. A treadle frame is attached by means of a link to a lever, which is upon the same spindle as the sword arm, and the knife edges are brought together by the pressure of the foot of the workman, or, if desired, the machinery may be worked by mechanical power, by applying power to the treadle lever, or the treadle lever may be dispensed with and the power may be applied direct to the sword arm. The spindle of the sword arm is made adjustable to compensate for wear in the cutting edge and other working parts and a gage plate with suitable marks or points, corresponding to the different recognized sizes of roofing slates, is placed on the frame-work, so that the rough slates may be laid in their proper places and adjusted with facility. If desired a double set of shears or cutting edges may be employed, so that two sides of the slate may be cut, trimmed or dressed at the same time, but this will not be found a convenient arrangement in practice. C. E. Amos, of Southwark, London, England, and John Francis, of Penrhyn, North Wales, are the inventors of this improvement.

*Skate Fastening.*—This invention consists in the employment of revolving cam buttons attached to the sides of the runners and acting upon the ends of the straps which serve to fasten the skate to the foot in such a manner that by turning the cam button after the strap has been drawn tight, the end is firmly clamped between the edge of the slot in the runner, through which it passes, and the point of each cam button and the ordinary buckles or other tedious fastenings can be dispensed with. Geo. P. Schifflin, of New York city, is the inventor of this improvement.

*Punching Press.*—This invention consists in the combination with the rod or pitman which connects the main shaft of the press with the slide carrying the punch or slide of an adjustable eccentric and clamp in such a manner that by rotating said eccentric the position of the punch or cutter in relation to the work, can be adjusted with the greatest facility and with perfect accuracy. It consists, further, in the arrangement of a slide with triangular guides operating in two jaws cast solid with the stock of the press and held in place by a triangular gib, in such a manner that all the bearing points or surfaces of the jaws and of the carriage can be planed off by one operation and without changing the position of the piece to be planed on the bed of the planing machine, and consequently all these surfaces must be perfectly parallel; and furthermore, the set screws used to adjust the gib



ISSUED FROM THE UNITED STATES PATENT-OFFICE  
FOR THE WEEK ENDING JANUARY 26, 1864.  
Reported Officially for the Scientific American.

or gibs bear square on a flat surface so as to allow of setting and retaining said gib or gibs with the greatest accuracy. It consists, also, in a touch-off motion or peculiar construction, whereby the clutch-pin is moved by the direct action of the cam. And, further, in the use of a loose clutch-pin, the position of which is entirely controlled by the direct action of the cam and is not made dependent upon springs or other mechanical devices. Also in the application of a yielding coupling-pin in combination with the clutch-pin and cam is such a manner that if the clutch-pin is pushed out when it stands opposite to the coupling pin, the latter will yield, and injury to the working parts of the press will be prevented. Finally, in attaching the cam motion to a yielding pin to prevent an accident in turning the press back. N. C. Stiles, of West Meriden, Conn., is the inventor of this improvement.

**Machine for cutting Slats for Window Blinds.**—This invention relates to a machine for cutting the thin slats which are used for making inside rolling blinds for windows, and it consists in the employment of adjustable cutters and a stationary concave and a gauze wire, all arranged in such a manner as to admit of the slats being cut from the bolt by simply shoving the latter along over the cutters, the device being capable of cutting the slats both from straight and cross-grained wood. G. H. Denison, of Suspension Bridge, N. Y., is the inventor of this improvement.

**Manufacture of Soap.**—This invention consists in a composition of grease, flour, sal soda, borax, salt tartar and alkali, which are mixed together in suitable proportions and in a peculiar manner, so that by the combination of the flour with the grease the latter is enabled to combine with a much larger quantity of alkali than it can without the flour, or when the flour is first mixed with the alkali and a soap is produced which is not liable to shrink and possesses superior washing qualities. S. A. Sealy, of Brooklyn, N. Y., is the inventor of this improvement.

**Securing Boiler Tubes.**—The object of this invention is to so apply the tubes in the two tube sheets of a boiler as to make very tight joints and to provide for their easy removal when necessary to repair or renew them. The tubes are screwed into tapped holes in the two tube sheets, the holes in one sheet being larger than those of the other, and the corresponding ends of the tubes are enlarged to fill the larger holes by means of taper thimbles which screw on to the tubes and into the latter holes, and it is in such enlargement of the tubes at one end that the invention consists. James Howell and David Birdsall, of Jersey City, N. J., are the inventors of this improvement.

**Steam-pump and Boiler Feeder.**—This apparatus consists, essentially, of a hollow or chamber shaft, from the opposite sides of which project arms carrying hollow balls or chambers which, being alternately filled with water and with steam, impart, by the gravity of the water, a rocking motion to the shaft. The opposite sides of the apparatus are thus thrown into alternate communication with a steam boiler and with an elevating condensing chamber, the water descending from which displaces the steam within the oscillating balls, causing the said steam to ascend to the condensing chamber and pass down through a pipe within the same, by which means it is instantaneously condensed without previous expansion, producing a partial vacuum within the condenser, and thus causing water to be supplied thereto from any suitable external reservoir. The apparatus is entirely automatic in its action, and by means of the alternate pressure and condensation of steam, may be made to elevate or force water for any purpose desired. When employed for supplying steam boilers, the parts are so arranged that when thrown into communication with the boiler, the water will descend into it by its gravity in a manner common with boiler feeders. The inventor is Mr. George I. Washburn, of Worcester, Mass.

**WANTED—TAR FOR PAINT.**—A correspondent connected with one of our telegraph companies informs us that coal tar is a good non-conductor and an excellent preservative for telegraph posts, but when applied cold it washes off. As it is difficult and inconvenient to apply it hot for such purposes, he desires us to call the attention of inventors to this subject, in order that they may make efforts to combine some other substance with it, so as to apply it cold and render it permanently adhesive.

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

**41,353.—Machine for dressing Slates.**—C. E. Amos, Southwark, England and John Francis, Penrhyn, North Wales. Patented in England, July 27, 1863: I claim a machine for dressing slates, constructed and operating substantially as herein shown and described.

**41,354.—Drum Stove.**—A. S. Ballard, Mount Pleasant, Iowa: I claim the combination and arrangement of the base, A, annular drum, B, damper, C, and pipes, D and E, the whole forming a parlor heating drum, constructed and operating substantially as herein set forth.

**41,355.—Cooking Range.**—A. C. Barstow, Providence, R. I.: I claim, first, locating two ovens, one over the other, back of and above the fire, substantially in the manner hereinbefore shown and described.

Second, forming around the range a mantle composed of jaws and a rear plate supporting a top plate under the arrangement substantially as herein described.

Third, the employment of a pendant door hung upon hooks on either side of the oven, in such manner that it shall perfectly close the opening thereof, while its removal may be effected by lifting without interfering with the boilers, substantially as set forth.

**41,356.—Barrel-head Machine.**—Alfred Benster, Detroit, Mich.: I claim, first, the employment or use of the revolving planer, C, as described, for the purpose of turning, planing and chamfering barrel heads at one operation.

Second, the revolving toothed rings, G G', and rising and falling frames, H H', in combination with the planer, C, constructed and operating in the manner and for the purpose substantially as described.

Third, the turn-table, J, in combination with the toothed rings, G G', and cam, L, constructed and operating substantially as and for the purpose specified.

Fourth, imparting to the rings, G G', turn-table, J, and revolving cutter, P, a rising and falling motion by the action of the cam, L, as and for the purpose set forth.

Fifth, the rising and falling standard, I, hinged board, K, and lever, R, in combination with the cam, L, frames, H H', and sash, Q, all constructed and operating substantially as and for the purpose described.

Sixth, the eccentric shaft, R, with cog-wheel, S, in combination with the toothed ring, G', constructed and operating substantially as and for the purpose set forth.

Seventh, imparting to the head to be turned an eccentric motion under the planer, as and for the purposes specified.

[The object of this machine which forms the subject of this invention is to plan the upper surface of a barrel head to the desired oval shape, make the upper and lower chamfers impart to said head the desired elliptical shape, revolve, clamp and loosen the same automatically, without the assistance of the operator, who has nothing else to do but to arrange the pieces for a head on a table in front of the machine and push the same in, and in doing so the finished head is pushed out on the opposite side of the machine and deposited on a table situated in a convenient position to receive the same.]

**41,357.—Filter.**—Benjamin Best, Dayton, Ohio: I claim, first, the construction of the box, A, with removable perforated partitions, a, b, in combination with the perforated cylinders, B', space, e, and jacket or casing, C, substantially as and for the purpose described.

Second, claim the combination of an upper horizontal detachable filter, A, with a lower permanent vertical filtering chamber, B', substantially as and for the purpose set forth.

Third, the combination of the horizontal filtering box, A, with the upright filtering chamber, B', passage, e, and outlets, ff, arranged and operating substantially as described.

**41,358.—Spring Bed-bottom.**—George Bevis, Rochester, N. Y.: I claim a new article of manufacture a continuous and elastic bed-bottom, composed of the slender yielding rounds or slats, a, a, secured closely together in any manner by the cords, bb, or equivalents, substantially as herein described.

**41,359.—Blacking Brush and Holder.**—Daniel Bowker, Boston, Mass.: I claim my improved combined brush and blacking holder, constructed substantially in the manner and for the purposes as above described.

**41,360.—Endless Chain Propeller.**—W. W. Bowman, Graves county, Ky. Ante-dated Jan. 20, 1864: I claim the arrangement and construction of the chain propeller, with inside and outside paddles operating upon open toothed wheels, all in combination as herein described and for the purposes set forth.

**41,361.—Slide Valve of Steam Engines.**—Jacob Bradley, St. Mary's, Ohio: I claim the slide valve, E, having two cavities, g g', in combination with the system of ports c c' d' e, communicating with the high and low pressure cylinders, steam chest and exhaust pipe, substantially as herein specified.

[This invention relates to that class of steam engines in which steam of a high pressure is first used in a cylinder of small diameter and afterward at a lower pressure in a cylinder of larger diameter. It consists in an improved slide valve and system of ports for effecting the induction and eduction of steam to and from the two cylinders.]

**41,362.—Truss-pads.**—Albert Bridges, Jersey City, N. J.: I claim at aching the hollow elastic ball to the truss spring by means of the headed pin, d, and screw nuts, e and f, the head of said pin being introduced within the ball, as specified, and in combination with the elastic ball and pin, d. I claim the cap, c, for the purpose of retaining the ball in its proper position as specified.

And I claim regulating the elasticity of the hollow pad by the action of the air confined within it by the screw, l, or its equivalent, as set forth.

**41,363.—Leather-rolling Machine.**—J. G. Busfield, Feltonville, Mass.: I claim the combination and arrangement of the levers c c', and

treadle, N, placed within the frame, A, and connected by the adjustable rods, Q Q, substantially as and for the purpose set forth.

I further claim the adjustable bearings, ff, of the roller, L, placed in the levers, c c, when used in combination with the treadle, N, and the roller, B, for the purpose herein specified.

[This invention relates to a new and useful arrangement of lever frame in which the lever and adjustable roller is hung, whereby said roller may be raised and lowered to regulate the pressure on the leather as may be desired without in the least affecting the gearing by which the lever or adjustable roller is driven. The invention also relates to an improvement in attaching the treadles to the lever frame of the adjustable roller, whereby the movement of the former may be regulated as desired, and the invention further relates to the employment or use of adjustable bearings arranged in the lever frame to receive the journals of the lever or adjustable roller to admit of the independent adjustment of the latter, as may be required.]

**41,364.—Sail Cringle and Clew.**—Frederick Chandler, Charlestown, Mass.: I claim a metallic cringle of two parts for grasping the rope and sail; these parts held together by screws or rivets, the whole constructed and the parts thereof arranged, substantially as and for the purpose specified.

**41,365.—Submarine Boat.**—James Carver, Bellvue, Ohio: I claim the employment or use of the vertically-swinging adjustable pins, B, at or near the bow of a boat, A, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, the tank, D, containing inflammable liquid in the hull of a submarine boat, in combination with a suitable pump, W, and pipes, 5 6 7, all constructed and operating in the manner and for the purpose substantially as set forth.

Third, the vertically-adjustable propellers, M', in combination with the boat, A, constructed and operating in the manner and for the purpose substantially as specified.

Fourth, the regenerator, R, in combination with the steam generator, G, and boat, A, constructed and operating substantially as and for the purpose specified.

[The object of this invention is to produce a submarine boat, the motion of which can be perfectly controlled in every direction, two vertically adjustable screw propellers being provided to cause the boat to descend to any desired depth or to ascend to the surface, one ordinary propeller at the stern and two hinged wings or fins at the bow for the purpose of propelling the boat and of directing its course upward or downward.]

**41,366.—Hitching Strap.**—Peter Conover, Kingsessing, Philadelphia, Pa.: I claim as an improved article of manufacture a hitching strap, provided with a safety ring, D, near the buckle, and otherwise constructed as herein shown and described.

[This invention consists in the application to a hitching strap of a ring large enough to admit of passing through it the snap at the loose end of the strap and at a distance of about three inches (more or less) from the buckle which serves to attach said strap to a post or tree, in such a manner that on applying the strap to a post or tree a strain exerted on it is not able to disengage the same from the tongue of the buckle, and furthermore, by such strain the strap is drawn up to the post or tree with increased tightness, thus preventing it from slipping down to the great inconvenience of the horse and of the persons having charge of the same.]

**41,367.—Machine for cutting Slats in Window Blinds.**—G. H. Denison, Suspension Bridge, N. Y.: I claim, first, the concave bed, D, in combination with the adjustable cutter, E, arranged in connection with the bed-piece, A, substantially as and for the purpose herein set forth.

Second, the cutter, H, provided with the grooved cap plate, J, and fitted in the bed-piece, A, substantially as and for the purpose specified.

Third, providing the bed-piece, A, with the longitudinal grooves, a, a', in combination with the two cutters, E H, provided respectively with the concave bed, D, and cap-plate, J, substantially as and for the purpose specified.

**41,368.—Lathes for Turning Spokes.**—Theophilus Derlington, Du Quoin, Ill.: I claim, first, controlling the lateral motion of the cutters, and at the same time feeding them up to the work of making spokes by means of a single pattern, constructed and operating substantially as described.

Second, a spoke pattern constructed with a spiral or screw thread on its surface, substantially as and for the purposes described.

Third, the oscillating traveling carriage, H J, in combination with the traveling weight, I, tooth, n, and a spoke pattern operating substantially as described.

**41,369.—Apparatus for addressing Newspapers, &c.**—Wm. M. Doty, New York City: I claim the employment of the oscillating feed levers, F, fingers, l, and curved bed, K, in combination with the gate, B, in the manner and for the purpose herein shown and described.

I also claim the combination of the spring, d, with the cutters, D E, and gate, B, in the manner herein shown and described.

[This invention consists in the arrangement of a rising and falling gate acted upon by a suitable handle and spring, and provided with a movable cutting jaw or blade in combination with a curved bed, stationary cutting blade end, and oscillating levers provided at the upper ends with cam slots fitting over pivots projecting from the ends of the rising and falling gate, and carrying at their other ends a rock-shaft provided with pointed fingers or dogs and acted upon by a spring or springs, in such a manner that on depressing the gate the pointed fingers or dogs are carried back, and on raising the gate the said fingers act on the paper and feed it at regular intervals to the cutting blades. Mr. Doty's address is 42 Park-row, New York City.]

**41,370.—Spoke-socket and Felly Clamp.**—L. D. Flanders, Cleveland, Ohio: I claim the plate, C, socket, A, lugs, B B, and lips, a, a, all cast in one piece and secured to the felloe by means of the screw, b, b, substantially as and for the purpose specified.

**41,371.—Plowing Machine.**—D. D. Foley, Washington, D. C.: I claim the share, B, in combination with the rollers, E E E', and reversible platform, F, substantially as described, for the purpose of plowing up and inverting the surface of the earth with much less friction than is commonly experienced.

The share, B, and rollers, E, in combination with the revolving cutters, C, and colters, K3, or their equivalents for the purpose of more perfectly dividing soil ground.

The platform, F, in combination with latch springs, G, the geared wheels, H I and J, or their equivalents, for the purpose of rapidly inverting the sod, so that it will fall with certainty upside down, all substantially as described.

**41,372.—Pepper Bottle.**—J. W. Gay, Brooklyn, N. Y.: I claim a pepper box or bottle formed with a contraction in the neck, of the nature and for the purposes specified.

**41,373.—Carrying Cranks over Dead Points.**—Francis Glass, of Knightstown, Ind.: I claim the combination with the pin on rod, D, and cross head, C, of the angular block or gate, F, controlled by a spring or cam, and employed to carry the wrist-pin, H, beyond the dead points in the manner explained.

[By this invention the dead centers of the crank are effectually overcome, and the engine caused to work smoothly in all parts of its stroke, and adapted to be started with equal freedom at any point.]

**41,374.—Feed-water Heater for Steam Boilers.**—A. M. Granger, of St. Louis, Mo.: I claim, first, The basin, d, in combination with the immersed