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NEW YORK, DECEMBER 28, 1867.

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Improvement in Hulling and Cleansing Hominy.

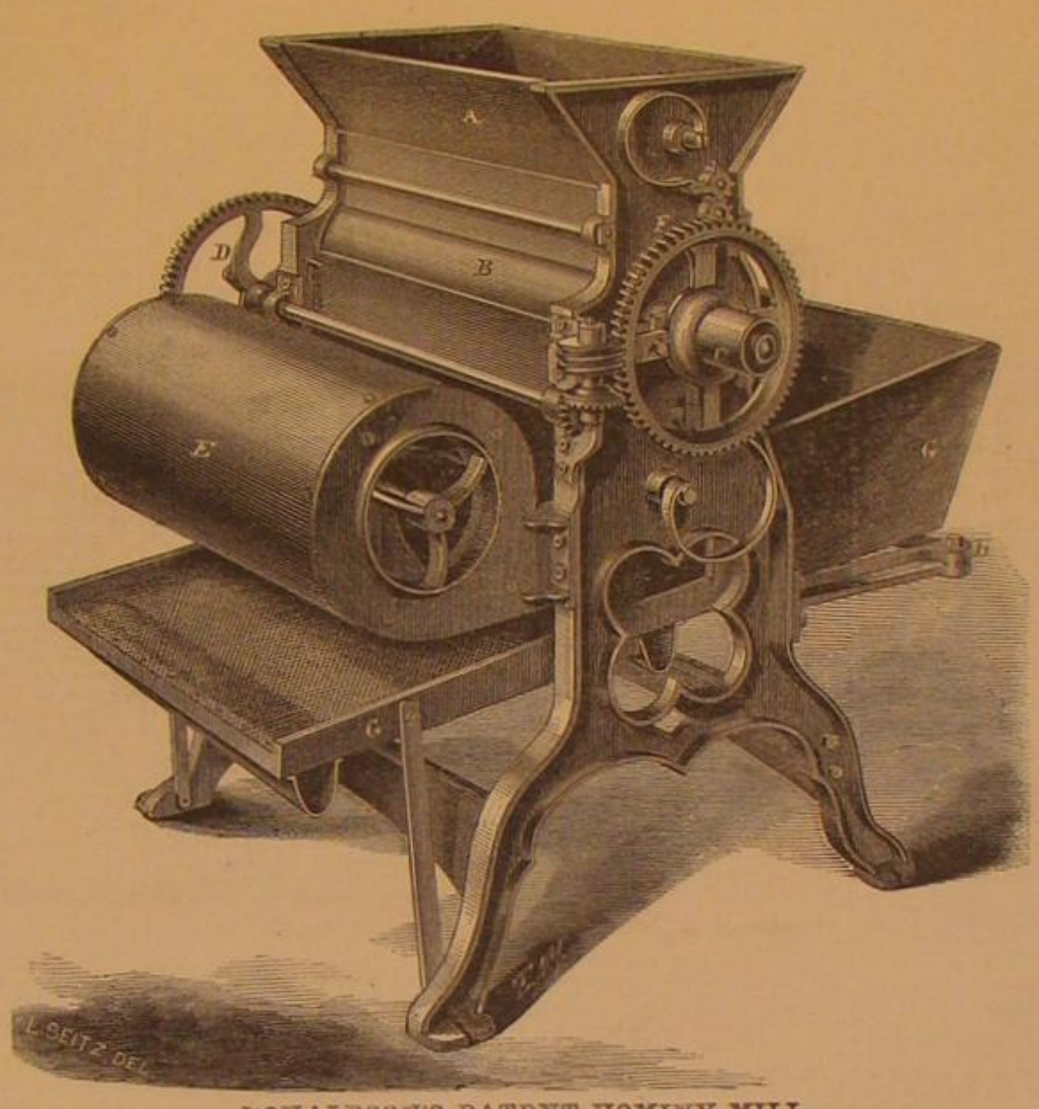
Many of our readers well remember when "hulled corn" was a standing winter dish. This was corn or maize the kernels of which were denuded of their "hulls" by the chemical action of alkalies, which, however, impaired the sweetness of the food. Hominy is corn deprived of the hulls by mechanical means leaving the corn with all its original flavor unimpaired. Hominy is a favorite dish throughout the country, but is not always entirely free from particles of the outer skin of the kernels. The mill shown in perspective in the engraving is intended to obviate this objection.

The corn is placed in the hopper, A, from which it is fed to the hulling cylinder contained in the case, B. The hulling machinery is driven by a belt on the pulley, C, the other end of the shaft of which carries a pinion which gives motion to the gear wheel, D. This, by means of a pinion on the shaft of the blower, E, drives the fans of the blower. On the other, or front end of the shaft which carries the gear, D, is a bevel gear by which another bevel gear and worm is turned. The worm rotates the worm gear, F, in two opposite arms of which are slots that carry pins projecting inwards, which may be moved toward or away from the center. This gear wheel turns free on the shaft that carries the pulley, C, and is intended for opening, by means of the pins in the arms and levers, a cover in the bottom of the hopper and a valve in the bottom of the hulling cylinder. Coiled or bent springs return these levers or valves to place when the pin which moves them has passed.

A wrist-pin on the gear, D, forms a crank which is connected to a bar at the rear end of the sieves, G, pivoted to an arm at H, by which the sieves have a shaking or reciprocating motion as the machine operates. The blower drives out the hulls and the motion of the sieves with their inclined position insure access of the air to every portion of the hominy.

It will be noticed that the connection of all the parts is absolute. The motion of the sieves, the speed of the blower, and the action of the inlet hopper valve and the delivery hulling valve are always exactly proportioned to the speed of the hulling cylinder, whether fast or slow. The upper or feed valve opens upward and has a downward projecting lip that shuts into a recess in its seat which insures security against leakage from the hopper to the hulling cylinder during the intervals of its being raised; a great advantage in hominy making, as no grain ought to get into the batch until that in the cylinder is done.

Patented Oct. 15, 1867, by John Donaldson, who may be addressed for further information at Rockford, Ill.



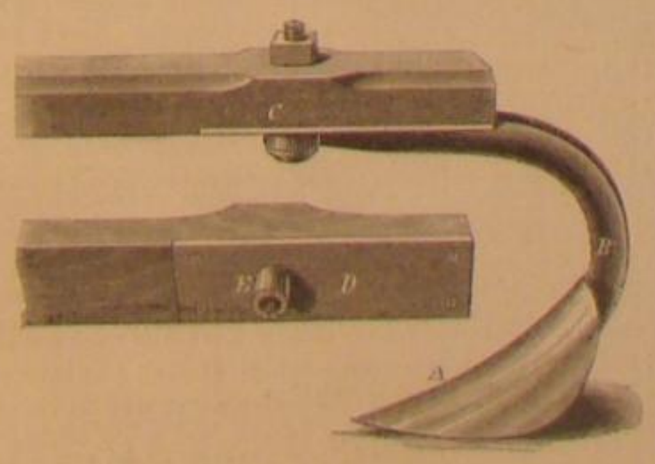
DONALDSON'S PATENT HOMINY MILL.

Nitro-Glycerin.

Professor Doremus of this city was called as a witness at at the inquest upon the bodies of the unfortunate persons killed by the recent explosion at Bergen, N. J. The Professor having previously analyzed some of the explosive mixture, testified as follows:—"I have subjected it to chemical analysis, and find it to correspond to the formula C_6, H_3, O_9, and $N O_5$; it is well made nitro-glycerin; the substance freezes at about 46; it is made to decompose in a very peculiar way; on moistening paper with it it burns with rapidity; it does not explode when red-hot copper is placed in it; we tried it with the most intense heat we can produce with a galvanic battery with two hundred cells holding a gallon and a half each; some nitro-glycerin was placed in a cup and connected with one of the poles of the battery; through a pencil of gas carbon the other poles of the battery were connected with the glycerin, no explosion ensued; but when the point touched the britannia vessel the nitro-glycerin took fire, a portion burning and the rest scattering about; this is as severe a test as we can submit it to in the way of heat under the pressure of the air; we therefore would conclude that nitro glycerin carried about exposed cannot explode, even if you drop a coal of fire into it; if the liquid is confined, or is under pressure, then an explosion will ensue; if paper be moistened with it and put on an anvil and a smart blow given with a hammer, a sharp detonation ensues; if gunpowder or the fulminates of mercury, silver or gun-cotton be ignited in a vacuum by a galvanic battery, none of them will explode; if any gas be introduced so as to produce a gentle pressure during the decomposition, then a rapid evolution of gases will result; the results of decomposition in a vacuum differ from those under atmospheric pressure or when they are burnt in a pistol, musket, a cannon, or in a mine; where we have little or no pressure it is difficult to get these substances to burn rapidly; nitro-glycerin is more difficult to explode than powder; in many respects it resembles gun-cotton which is made in a similar way; if gun-cotton be immersed in the proto-chloride of iron it turns into common cotton; the same experiment was tried with nitro-glycerin by mixing it with proto-chloride of iron, and it reverted into common glycerin; there are four well known varieties of gun-cotton made by employing acids of different strengths they differ in chemical composition and properties, as well as in their explosive qualities; the late Minister of War in Austria in 1862 stated to me that he had ordered four hundred cannon for gun-cotton, and six months after he stated that he had ordered all the cannon to be changed and adapted to powder, in consequence of spontaneous combustions; much less is known of nitro-glycerin than of gun-cotton, and probably several varieties of this article may be formed as of gun cotton; this would explain cases of spontaneous explosion; if the nitro-glycerin is not carefully washed to get rid of the acid, a gradual decomposition will ensue, producing gases, which, if the vessel be closed, will explode; my opinion is that nitro-glycerin should be used in the most careful hands; do not think I would put it in the hands of a common laborer for blasting purposes; it is less dangerous in a frozen than a liquid state; I think concussion would explode frozen nitro-glycerin.

HISERT'S ADJUSTABLE CULTIVATOR TOOTH.

The object of the device exhibited in the engraving is to allow the teeth of a cultivator to turn slightly and avoid obstructions, while they will follow at all times the line of draft, so that in turning the cultivator there is no risk of breaking the teeth or their shanks, or of overturning the implement. The cultivator blade, A, may be of any desired form, and it is secured to the curved shank, B, which is pivoted by a bolt to the beam, C. On the under or lower side of the beam is an iron plate, D, having a projecting socket, E, which is the stud or pin on which the eye of the shank turns. A bolt passing through the socket and beam holds the shank in place. Farmers will readily perceive the advantages of this device. It may be applied to any or all of the different cultivators now in use. Patented Sept. 3, 1867, by B. F Hisert who may be addressed for rights to make or sell at Norton Hill, Green Co., N. Y., or address G. W. King, Scoharie, N. Y.



Remedy for Cold Feet in City Cars.

"Riding down town these cold mornings in the horse cars, the unpleasant sensation of chilled feet reminds us of the plan adopted in France and other parts of Europe to keep the feet of car passengers warm. This is accomplished by inserting a flattened iron tube along the bottom of the car lengthwise in the center, between the rows of seats. This tube is raised a little above the floor level of the car to afford a rest for the feet, yet, not enough to make a stumbling block. When the car leaves the depot this tube is filled with hot water from a boiler kept heated for the purpose, and this water retains its heat and gives a pleasant warmth to the feet of the passengers and the car generally, for about two hours, after which the tube is refilled at a convenient station on the road. In the case of our city cars this might easily be done, and be a cheap and exceedingly comfortable improvement."—*Evening Post.*

It should be understood that the French cars are arranged with small compartments like stage coaches, and the passengers sit face to face, with the warming tube above described under their feet. One tube for every six persons. We should be glad, indeed, to see this plan introduced here. But it is not to be expected that our city railroad companies will do anything for the comfort of their passengers, while without such trouble they continue to reap rich harvests. Very likely the idea of loading a lot of hot water upon their cars, for passengers to stand upon, would strike them as a good joke. Their poor, broken down, spavined horses, could not stand any additional load.

Getting Your Money Back.

The French are a curious people and one of the novelties of Parisian enterprises is a large warehouse, in which are sold, at retail, all manner of goods, from a diamond necklace to a shoe brush. The purchaser, having paid the price, receives not only the goods, but a bond for the whole amount of his purchase money, payable, after thirty years, and guaranteed by the Credit Foncier and other moneyed corporations. The prices charged are said to be no greater than in any other retail shops. This is really eating your cake in order to keep it; the more you spend the richer you will be; indeed it sets at defiance the whole of Franklin's code of proverbs, and proves "Poor Richard" a silly fellow. Imagine Jones lecturing his wife on her economy, and reproaching her for a spirit of saving, "My dear, if you had bought this camel's hair shawl thirty years ago, it would now be a source of income to us; if you had not been so close we should now be wealthy." Smith acquires an independence by giving his children an expensive education, and sees in every new dress or costly jewel which his growing daughters wear, a new mine of wealth for himself. If he can only persuade them to spend money enough he is sure of a support in his old age.

A GIGANTIC BRIDGE.—A suspension bridge is to be erected by M. Oudry, engineer, over the Straits of Messina, Sicily, from Point Pezzo, on the Calabrian Coast. It is to consist of four spans of 3,281 feet each, elevated about 150 feet above high-water level, so that the largest ships may pass under. The proposed Roebling bridge over the East River, between New York and Brooklyn, is to have a single span of 1,600 feet

THE through mails to the West now go in iron-bound boxes instead of leathern bags. Each box, tightly packed, contains about eight hundred letters.

THE first steam vessel used in Great Britain was called the *Comet*, and built by Henry Bell in 1812. It was thirty tuns burden.

OFFICIAL REPORT OF

PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING DECEMBER 10, 1867.

Reported Officially for the Scientific American

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

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

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

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

71,836.—MACHINE FOR NOTCHING KNITTING NEEDLES.—W. Aiken, Franklin, N. H.

I claim 1st, The improved machine, substantially as described, for effecting the several operations of notching, slotting, boring, and burring a knitting-machine needle blank, in the order and manner as explained.

2d, Also, the combination of one or more vibratory clamps, Y, the cam, E, and the two burrs or cutters, q r, for forming the notches in the needle blank such clamp or clamps, cam and cutters being provided with mechanism for operating them, substantially as described.

3d, Also the combination of one or more vibratory clamps, Y, the cam, E, the two burrs or cutter wheels, q r, and the slotting burr or cutters, s, provided with mechanism for operating them substantially as explained.

4th, Also, the combination of one or more rotary clamps, Y, the cam, E, the burrs or cutter wheels, q r s, and the drill, u, provided with mechanism for operating them, substantially as set forth.

5th, Also, the combination of one or more vibrating clamps, the burring cutter, t, the drill, u, and the slotting cutter, s, arranged and provided with mechanism for operating, substantially as explained.

71,837.—TEA AND COFFEE POT.—Alfred Arnold, Tenafly, N. J.

I claim 1st, In a tea or coffee boiler, the base, D, so constructed and adapted, relatively to the other parts, that an oscillating motion will be imparted to the vessel by process of ebullition, substantially as shown and described.

2d, In combination with the base or heating-surface, D, the chambers, b b', and diaphragm, E, or their equivalents, substantially as arranged and described, and for the purposes shown.

71,838.—TOOL FOR SIZING LAMP CHIMNEYS.—Lewis J. Atwood, (assignor to himself and Holmes, Booth and Haydens), Waterbury, Conn.

I claim the adjustable sizing and shaping-jaws employed, substantially as specified, in the manufacture of glass lamp-chimneys and similar articles.

71,839.—MODE OF PREVENTING THE UNTWISTING OF THE ENDS OF WIRE ROPE BANDS.—Artaur Barbarin, New Orleans, La.

I claim a wire rope band, in which the ends of the several wires composing the same are soldered together, substantially as herein described and shown in the accompanying drawings, and for the purposes set forth.

71,840.—SPRING-BED BOTTOM.—Alonzo B. Baty, Binghamton, N. Y.

I claim the construction and application of the bracket, B, in combination with the bail or pendant, C, the springs, D D, transverse pieces, F F, and slats, A A, all being constructed substantially as herein described and represented, for the purpose set forth.

71,841.—HORSE-RAKE.—H. L. Beach, Montrose, Pa., assignor to Beach Wheel Horse-Rake Manufacturing Company, N. Y.

I claim 1st, The teeth heads, N, constructed and operating substantially as described.

2d, In combination with the teeth heads, N, the teeth, Q, substantially as described.

3d, The arms, K, and teeth heads, N, combined and operating substantially as set forth.

4th, The cleaners, M, teeth heads, N, and teeth, Q, when combined for the purposes indicated.

5th, The blocks, i, pins, c, sliding bar, E, and lever, G, when combined for the purposes set forth.

6th, The hooks, 11, and pins, j, secured in the axle for the purpose shown.

7th, The washers, P, combined with the teeth and teeth heads, substantially as and for the purpose described.

71,842.—APPARATUS FOR LIGHTING STREET GAS-LAMPS.—J. W. Beard, St. Johns, New Brunswick.

I claim the combination of the hook, F, and the perforated cap, E, with the lamp, D', to be affixed on a pole or staff, as set forth.

Also, the combination of the curved or hooked arms, c c, with the key, k, of the cock of the burner, and their arrangement with respect to the opening in the bottom of the lantern, as explained.

Also, the combination of the socket tube, e, with the lamp, D', its hook, F, and perforated cap, E.

Also the combination of the receiving tube, f, and bayonet connection, g, with the socket tube, e, the lamp, D', its hook and perforated cap, as described.

71,843.—CALIPER AND T-SQUARE.—Joseph Bennor, Philadelphia, Pa.

I claim the rule, a, stand, c, slide, m, legs, p and q, marker, u, cutter, w, with their several described appendages, all combined in the manner and for the purpose substantially as shown and described.

71,844.—REFRIGERATOR.—Ferdinand Borchard, Detroit, Mich.

I claim 1st, A refrigerator which is provided with movable racks, H, within cooling chambers which are arranged beneath an ice chamber, B, constructed with inclined walls, a a a, a drip pan, D, and an ice-supporting rack, c, substantially as and for the purposes described.

2d, Providing the movable racks, with sliding brackets, I, which are so applied as to serve as supports for the outer ends of the racks when drawn partially out of their respective apartments, substantially as described.

71,845.—CONSTRUCTION OF METAL SALVERS.—George Brabrook, (assignor to Reed and Barton), Taunton, Mass.

I claim the arrangement and combination of the metallic ring and cap molding together, and with the waiter or salver, in manner substantially as and for the purpose specified.

Also, as a new or improved manufacture, a waiter or salver of britannia metal, having a metallic strengthening ring and cap molding combined and arranged with its body in manner as specified.

71,846.—MANUFACTURE OF SHOES, ETC.—M. L. Brett, Warren, Ohio.

I claim the construction of a seamless shoe, etc., by felting, in the manner set forth, as a new article of manufacture.

71,847.—CONSTRUCTION OF SCOOPS.—Theo. C. Bromley, Fort Howard, Wis.

I claim the cone-shaped back and the circular raised brace.

71,848.—WATER-RESERVOIR FOR EXTENSION-TOP STOVE.—Chas. H. Buck, St. Louis, Mo.

I claim 1st, the boiler, D, constructed with a depression in its rear side, in combination with a stove made with the extended top, A, and with, a stove-pipe, C, which is entirely independent of the boiler, but still is partly enclosed by the boiler, in the manner and for the purpose described.

2d, The boiler, D, with its depression in its rear side made wholly independent of the pipe, C, but capable of enclosing a portion of said pipe, and of being removed without disturbing the pipe, as herein described and shown.

71,849.—JOURNAL-BOX.—T. F. Burgess, Lowell, Mass.

I claim the drips, e e, and conducting holes, d d, in combination with the recesses, b b, when arranged to operate substantially as described and for the purposes fully set forth.

71,850.—HAY ELEVATOR.—E. H. Carpenter, Dexter, Mich.

I claim 1st, In combination with a cable, A, frame, F, wheels, G, sheave, E, and rope, C, the disengaging device, consisting of a collar, M, stop, L, and vertical catch, K, inclosing the cable, A, and rope, C, and operated substantially as described

2d, The combination of the frame, F, rope, C, collar, M, stop, L, catch, K, and valves, H, cams, I, and lever, I', said parts being constructed and the whole arranged substantially as set forth.

71,851.—STEAM GENERATOR.—C. E. Case, Xenia, Ohio.

I claim the metal cup, G, constructed and arranged substantially upon the principle and in the manner herein set forth.

71,852.—LOOM FOR WEAVING PALM-LEAF, ETC.—Geo. W. Chandler, (assignor to himself and Lysander F. Thompson), Fitchburg, Mass.

I claim 1st, The hinged holder, G, substantially as and for the purposes set forth.

2d, The combination of the hinged fingers, c c, with the ribs, b b b, substantially as and for the purposes set forth.

3d, The combination of the adjustable weight, G', with the bottom of the holder, for the purposes set forth.

4th, The combination with the hinged fingers, c c, of the hinged holding-piece, G'', substantially as and for the purposes set forth.

5th, The fingered stop or guard piece, h', with the holder, G, substantially as and for the purposes set forth.

6th, The combination, with the stand or plate, h, of the grooved hinged flap, i, for supporting the guard or stop-piece, h'.

7th, The combination with the ribbed holder, G, of the guide piece, s, as and for the purposes set forth.

The combination of the feed arm, m, with the slide-piece, n, and lever, 26, substantially as and for the purpose set forth.

9th, The combination with lever, 26, of the adjustable ears, 27 27 for the purposes stated.

10, The combination with slide-piece, n, and table, L, of the connecting piece, 21, substantially as and for the purposes set forth.

11th, The combination with the slotted slide piece, M'', and connecting piece, 21, of the double-shouldered bolts, 18 18, substantially as and for the purposes set forth.

12th, The combination with the curved lever, M, and the slide piece, M'', of the bent levers, M' M', substantially as and for the purposes set forth.

13th, The combination with the arm, 79, and notched bar, w, of the spring-pawl, t, substantially as and for the purposes set forth.

14th, Mechanism for separating the pieces of material to be fed, constructed and combined for operation substantially as described, and as shown in fig. 7, of the accompanying drawings.

15th, The combination with a loom for weaving palm-leaf and other cloth, of a push-finger, 41, substantially as and for the purposes set forth.

16th, The combination with the stem of the push finger, 41, of the catch-piece, 42, lever, 44, and operating springs, 43 and 46, substantially as and for the purposes set forth.

17th, The combination with the slide, n, of the projection or dog, 47, for releasing lever, 46, from the catch-piece, 42, as set forth.

18th, The combination with the hinged table, L, of the mechanism for separating and feeding the material, substantially as set forth.

19th, The combination with the stationary bed, L'', and stand, 72, of the hinged table, L, and catch, o, substantially as set forth.

20th, The combination and relative arrangement with the table, L, bed, L'', and holder, G, of the evener knives, 13 and 14, as shown and set forth.

21st, The combination with the bridge-piece, 50, of the hinged dog, 52, and bell-spring, 53, substantially as and for the purposes set forth.

22d, The combination and relative arrangement of mechanism, substantially such as is shown and described for communicating the proper motions to the feed arms, S, from lever, K.

23d, The combination with a loom for weaving palm-leaf of mechanism substantially such as shown and described for stopping the loom, as set forth.

71,853.—PITMAN COUPLING.—G. W. Clark, Manchester, Ind.

I claim the arrangement of forked pitman, A G G', bolt, H, screw shanked hook, D, and nuts, F F', or their equivalents, substantially as and for the purpose set forth.

71,854.—MACHINE FOR MAKING LEVEES.—Ernest Comeaux, Bayou Goula, La.

I claim 1st, The endless apron in combination with the hinged adjustable frame, K, operating as described for elevating the earth used in making levees, in the manner and for the purpose set forth.

2d, The combination of the endless apron, F, chains, H, slats, J, and adjustable supporting-frame, K, and standards, L, as herein described for the purpose set forth.

3d, The above in combination with the spur-wheels, C and B, and the endless chain, D, as herein described for the purpose set forth.

72,855.—CONSTRUCTION OF ROOF.—M. De K. Cutts, Richmond, Va.

I claim 1st, A tobacco drying house which is provided with a sectional hinged roof in combination with frames, A, which support the tobacco leaves while being dried and cured, substantially as described.

2d, The supporting posts, G, in combination with hinged sections, B B', elevating devices, and supporting frames, constructed and arranged in such manner that the leaves of tobacco upon said frames can be exposed to the action of the sun and air at pleasure substantially as described.

71,856.—CAR BRAKE.—Shadrach Davis, Dartmouth, Mass.

I claim a car brake, consisting of the broad connecting bar, C1, which rests on pivots, F1, working in slots, and has the brake-shoes movable fixed to it, the whole combined as described, operated by the bar, 12, and screw rod, H2, and by contact with the wheels as and for the purposes set forth.

71,857.—FEEDER FOR GRAIN MILL.—Michael Decamp, South Bend, Ind.

I claim 1st, The combination of the device, D, bridge ring-bearing, a b, feeder, c, and collar, e, substantially as described,

2d, The toothed eccentric, J, in combination with lever, G, and collar, e, substantially as described.

71,858.—PAINTER'S EASEL.—Paul Deschause, New York city.

I claim 1st, The extensible legs, consisting of the hinged legs, a, and their extension sliding parts, b, made and arranged substantially as described.

2d, Also the combination of the legs with the toggle-brace, c c, substantially as described.

3d, Also, the extensible rest, composed of the fixed part, e, and the sliding part, o, in combination with the fixed and movable clamps, f g, substantially as described.

71,859.—GUIDE FOR SAW IN SAW MILLS.—Hiram P. Dillingham, Norwalk, Ohio.

I claim the plates, A and A', guides, B B', and C and C', the whole constructed substantially as described, and operating as and for the purposes set forth.

71,860.—PRODUCING CALCIUM MAGNESIUM LIGHT.—Chas. A. Dresser, New York city. George A. Dresser, Trustee;

I claim the preparation of dolomite, native or artificial substantially as and for the purpose described.

71,861.—CALENDAR ATTACHMENT TO INKSTAND.—Sam'l. R. Dummer, New York city.

I claim 1st, An inkstand, etc., constructed with a series of shoulders or rests, B, whether one or more and one above another, in combination with the rings, C, and plate or frame, D, or their respective equivalents substantially as and for the purpose described.

2d, In combination with the above, the two tubes, H M, and plunger, O, as herein set forth for the purpose specified.

71,862.—PLANING MACHINE FOR WOOD.—G. B. Durkee and W. H. Murray, (assignor to themselves and I. T. Safford), Chicago, Ill

We claim 1st, The employment of two separately adjustable cutter heads in a single machine, so that the axis of one cutter may be at the angle of the other at a different angle, and both cutters operating at the same time upon the same board, substantially as specified.

2d, The crossheads, C, cutter-heads, E, screws, D and G, in combination with the standards, B, constructed and operating substantially as specified.

71,863.—SELF-ADJUSTING RELAY MAGNET.—J. M. Fairchild, (assignor to himself, J. K. Bundy, and J. M. Townsend), New Haven, Ct.

I claim the arrangement of the head, C, combined with the magnet, so as to be self-adjusting in relation to the armature, substantially as herein set forth.

71,864.—CORN CAKE CUTTER.—Leonard Felker, Tewksbury, Mass.

I claim the rotating cylinder, i, with its cutters, i' i', in combination with the rotating cylinder, ', with the stationary knives f' f', and adjustable finishers, g g, when arranged to operate substantially as described and set

2d, The pressure rotating cylinder, f, with stationary knives, i' i', and adjustable finishers, g g, substantially as described and set forth.

3d, The clearer, m, in combination with the rotating cutters, i' i', as described.

4th, The adjustable stands, d d, and lever, p, in combination with the table, b', and weight, o, when arranged to operate substantially as described.

71,865.—MEASURING FAUCET.—Elisha Fitzgerald, N. Y. city.

I claim the combination of a four way cock with a receptacle having a movable partition operated by the water, substantially as described, for the purpose of limiting and determining the amount of water to be discharged, as specified.

Also, in combination with the above, the dial and pointer, to indicate the amount of water discharged, as described.

71,866.—TWEER.—Charles C. Forncrook, Hermitage, N. Y.

I claim the combination of the valve, d, adjustable bridge, g, chamber, B, and tweer, A, arranged and operating substantially in the manner and for the purpose set forth.

71,867.—COTTON TIE.—John H. Fraley, New Orleans, La.

I claim the combination of the buckles, A and B, when they are constructed and united as described, with the ends of hoop iron, when bent into the form of hooks, as and for the purpose set forth.

71,868.—BRIDGE.—John Glass, George P. Schneider, and William B. Rezner, Cleveland, Ohio.

We claim, 1st, The tubular flanged sections, A B, as arranged in combination with the diaphragm, C, for the purpose and in the manner substantially as set forth.

2d, The tubular arch, as constructed, with sections, A B C, in combination with the foot block, I, provided with a flange or boss, K, when arranged in the manner as and for the purpose set forth.

71,869.—OIL CUP.—John H. Gomer, New York city.

I claim the combination of the cap, B, with its screw flange, b, and case, A, provided with suitable tube, C, in the manner and for the purpose herein specified.

71,870.—PEAT MACHINE.—George D. Goodrich, Chicago, Ill.

I claim, 1st, The adjustable bearing for the shaft, B, composed of two or more segments, r, constructed and operating substantially as described.

2d, The separate troughs, I, located below the tempering mill, when more than one expelling screw is employed, so as to give each screw a separate and independent action, substantially as specified.

3d, The cutter or knife, F, for cutting the material into suitable lengths in a peat machine having a continuous discharge from the expelling mill, substantially as specified.

4th, Closing the mouth of the die by an adjustable intermittent stop or knife, when so arranged that the movements can be varied with respect to the movements of the other operating parts of the machine, substantially as specified.

5th, The double slotted plate or wheel, K, provided with the sockets, h, and pins, l, for the purpose of adjusting the movements of the cutter stop or knife, F, substantially as described.

6th, The combination of the separate troughs, I, expelling screws, H, and cutter stop, F, with a tempering mill, substantially as specified.

71,871.—RATCHET BED KEY.—William M. Gray, Brooklyn, N. Y.

I claim the bed key constructed and arranged as above described, as a new article of manufacture.

71,872.—MODE OF PREVENTING THE EXPLOSION OF LAMPS.—Cyrus P. Grosvenor, McGrawville, N. Y.

I claim the application to lamps or heaters, using coal oils, alcohol, or other explosive substances, of such a burner as will supply the vacuum made in the reservoir by the combustion with nitrogen gas, the burner being constructed as herein described, or in any other form substantially the same, and which will produce the intended effect.

71,873.—CAR-AXLE BOX.—Joseph Harris, Dorchester, Mass.

I claim, 1st, The roller guides, i, with detached radial joints, substantially as described.

2d, In combination with the system of rollers and box, g, the construction of the axle, with its extension, e, and shoulder, d, as and for the purpose set forth.

71,874.—WASHING MACHINE.—Job H. Haskell (assignor to himself and Horace Taplin), Lowell, Mass.

I claim the general construction and combination of all the parts, consisting of the cylinder, G, series of yielding rollers, a, roller stands, k, spring bars, f, levers or arms, m, spring bar, D, transverse bar, R, rod, O, and the box, the whole arranged to operate substantially as and for the purpose set forth.

71,875.—HORSE RAKE.—John V. Hawkey (assignor to himself and Israel T. Sheffler), Greensburg, Pa.

I claim, 1st, A rake shaft or head, arranged outside of the periphery of the wheels, projecting laterally beyond them, and so jointed that its sections can be folded vertically upon the carrying frame without detaching any of the parts of the rake, substantially as described.

2d, An axially turning rake-shaft, so jointed that its outer sections can be folded inwards without detaching any of its parts.

3d, The combination of the inner fixed section of the rake shaft with the outer vertically folding sections, projecting beyond the wheels, substantially as and for the purpose described.

4th, The combination, substantially as described, with a jointed rake shaft, of hinges allowing the sections to fold vertically, and a locking device to hold them rigidly when unfolded.

5th, The arrangement as described, of the top pins, m, on the folding sections, to secure them in position when folded up.

6th, The combination in a horse rake, of an axially turning folding rake shaft, with a rock shaft controlled by a handle on the driver's platform to raise and lower the teeth.

7th, The arrangement, in a horse rake, of an axially turning jointed rake shaft, mounted on the rear end of the thills, and supported on two wheels mounted on independent axles.

71,876.—APPARATUS FOR DRAINING SUGAR.—James B. Hill, Allegheny City, Pa.

I claim the combination and arrangement of the hopper, C, provided with valve, d, case, B, screen, R, distributing drum, P, distributor, f, provided with valve, l, scraper, S, chute, h, and pipe, t, the whole being constructed, arranged, and operating substantially in the manner herein described, and for the purpose set forth.

71,877.—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—James B. Hill, Allegheny City, Pa.

I claim the use of a fan when used in combination with the shield, m, distributor, f, screen, R, case, B, hopper, C, and scraper, S, constructed, arranged, and operating, substantially in the manner herein described, and for the purpose set forth.

71,878.—CARD HOLDER.—Samuel L. Hill, Brooklyn, N. Y.

I claim, in combination with a back or support, the use or employment of any number of strips when the same shall be constructed and combined substantially as shown for the purpose specified.

71,879.—FISHING LINE SWIVEL.—Martin Hiltz, Gloucester, Mass.

I claim the improved swivel, as made with the screw bolt, D, and the nut chamber, c, arranged and combined, as explained, with the parts, A B C, constructed and applied together as specified.

61,880.—IMPLEMENT FOR LIGHTING GAS.—Thomas W. Houchin, Morrisania, N. Y.

I claim, 1st, Placing a receiver, A, at the lower end of a tube, B, for the purposes fully described.

2d, The combination of a receiver, A, tubes, B, and wick chamber, C, when the same shall be constructed substantially as described, for the purposes set forth.

71,881.—CORN-POPPER.—J. W. Howe, and J. K. Barton, Worcester, Mass.

We claim, 1st, The combination of the twisted wires, a a a' a', with the handle, B, and receptacle, A, substantially as and for the purposes described.

2d, The combination of the wires, a' a', with handle, B, receptacle, A, and cover of the same, as and for the purposes described.

3d, The combination of the wires, a a a' a', with each other, receptacle, A, and cover of same, as shown and described.

71,882.—COPY BOOK.—Benj. G. Howes, Worcester, Mass.

I claim the copy book, constructed substantially as described.

71,883.—PETROLEUM GAS BURNER.—G. A. Hyver, New Orleans, La.

I claim, 1st, The combination of the pipe, D, when filled with finely broken charcoal, with the concentric or annular chamber, F, the latter being provided with pipes, b, extending upwardly into the cup furnace or heat retort, H, as and for the purpose substantially as set forth.

2d, The combination of the pipe, D, when filled with finely broken charcoal, the concentric or annular chamber, F, pipes, b, and pipe, d, with the gas pipe, c, when the latter is provided with the valve, J, for regulating the flow of gas, as and for the purpose described.

3d, The gas pipe, c, when constructed and arranged with relation to the chamber, F, and one of the pipes, b, as described, in combination with the valve, J, for the purpose set forth.

4th, The combination of the concentric or annular chamber, F, and pipes, b, with the cup furnace or heat retort, H, when the latter is constructed as described, and shown upon the drawings, and occupies the relation to the former herein set forth, for the purpose set forth.

5th, The pipe, d, in combination with one of the pipes, b, for the purpose of affording a light for illuminating purposes, as herein described.

71,884.—SHAFT COUPLING.—John Keesey, Chester, Pa.

I claim the combination of the box, hub, or shell, B, reverse wedge-shaped blocks, C C', and bolts, D D', with their nuts, E E', or the equivalents of these devices, arranged for operation together, substantially as and for the purposes herein set forth.

71,885.—CLAMP SCREW.—Charles L. Kingsley (assignor to Charles Parker), Meriden, Conn.

I claim the nut, E, formed with the seats, F, and the lever, G, formed with the trunnions, I, so as to be combined and operate in the manner and for the purpose described.

71,886.—MACHINE FOR BENDING WOOD.—Joseph Klahr, Bernville, assignor to himself, W. R. Weand, C. H. Zink, and James J. Wagenhorst, Philadelphia, Pa.

I claim, 1st, The formers, F F', with their arms, p p', levers, k k', and catches, q, or their equivalents, in combination with the clamps, G, the whole being constructed and operating substantially as and for the purpose described.

2d, The combination of the above, the weighted levers, D D', and the links, l.

3d, The adjustable plates B B', with their shoulders, c, operating in combination with the formers, and their projections, q, substantially as and for the purpose described.

71,887.—OIL CAN.—George Alvan Knowlton, Natick, Mass.

I claim, 1st, The stoppers, D and I, retracted from their respective orifices by a single trigger, H h', and provided with two springs, G J, to insure the effective closure of both said orifices, substantially as described.

2d, In a valved oil can, constructed as above specified, the arrangement of the trigger, H h', obliquely on the upper side of the handle, A', as and for the purpose set forth.

71,888.—FENCE.—Ira Lackey, Lebanon, Ohio.

I claim the combination of the sills, A, braces, C, and hooks or loops, l j, with the grooved posts, a c, of the panels, when the parts are constructed and arranged to form a detachable and portable fence, in the manner and for the purpose specified.

71,889.—BUTTER DISH.—Nathan Lawrence (assignor to Reed and Barton), Taunton, Mass.

I claim the arrangement and combination of the friction spring with the cover and vase, the journal and the bearing to extend entirely around the said journal, as specified.

71,890.—HARVESTER RAKE.—Edward J. Leyburn, Lexington, Va.

I claim, 1st, Connecting the rake arm, E', to a loose collar, c, on reel shaft, B, by means of a pivot, d', carrying an arm, f, in combination with the jointed connecting rod, h, substantially as described.

2d, The arresting plate, G2, in combination with the rake pivot, d', arm, f, and collar, c, and connecting rod, h, substantially as described.

3d, The cam plate, G G1, in combination with the rake pivot, d', loose collar, c, and connecting rod, h, substantially as described.

4th, The anti-friction roller, i, applied to the arm, f, of the rake pivot, in combination with the arresting plate, G2, substantially as described.

5th, Connecting the arm, f, which is in the rake pivot, d, to the reel shaft or reel arm thereof, by means of a rod, h, and universal joint, h', substantially as described.

6th, The application of a weight, g, to an arm, f, of the rake pivot, when said arm is upon a loose collar, c, and arranged to operate substantially as described.

71,891.—WASHING MACHINE.—Reuben Lighthall, Brooklyn, N. Y.

I claim the detachable holder, A, with the set screw, B, in combination with the slotted lever, D, and the rollers, F F', and the cam, R, as and for the purpose set forth.

71,892.—PROCESS FOR RENDERING PAPER, CLOTH, AND THE LIKE, FIRE AND WATER PROOF.—Robert O. Lowrey, Salem, N. Y.

I claim the process, substantially as herein described, of treating fibrous and other materials for rendering them fire and water proof.

71,893.—COMPOSITION OF MATTER FOR THE MANUFACTURE OF WATER PROOF PAPER AND OTHER ARTICLES.—Robert O. Lowrey, Salem, N. Y.

I claim, 1st, The new compound or composition of matter, produced by the treatment of vegetable fiber, substantially as described.

2d, The process herein described of treating vegetable fiber for producing a new compound, substantially as set forth.

71,894.—STREET SWEEPER.—Robert Y. McConnell and Geo. Pringle, Rochester, N. Y.

We claim, 1st, The pinions, a, of the counter shaft, s, combined with carrier wheels, W, of street sweepers, by suitable sliding clutches, c, all arranged substantially as shown and described, and for the purpose of equalizing the strength and efficiency of those portions of the machine.

2d, The broom shaft, b, and the counter shaft, s arranged substantially as shown, being held by means of the adjustable rigid straps, y, for the purposes set forth.

3d, The spring clutches, c, governed by means of the hand lever, D, connecting rod, f, lever, k, and the counter inclined planes, m, all arranged and operating substantially in the manner and for the purposes set forth.

71,895.—UTERINE SUPPORTER.—Frederick Meriwether, Tamola, Miss.

I claim the combination, as described, of the spring, E, composed of copper or other soft metal, with the pessary, for the purposes set forth.

Also, the combination, substantially as described, of the pelvic spring, the vertically adjustable bar and set screw, the soft metal spring, E, the pessary pillar, F, and the pessary, for the purposes specified.

71,896.—RAILROAD SIGNAL.—Abraham S. Miller (assignor to himself, J. P. James, and Charles Folsom), Zanesfield, Ohio.

I claim, 1st, The combination of the trigger, E, and rock shaft, F f, with a railroad signal and suitable intermediate connections, so arranged that the contact of the train with said trigger shall throw the signal into its conspicuous position, substantially as described.

2d, The arrangement of the trigger, E, rock shaft, F f, arm, H, link, I, lever, G, wire, J, eccentric lever, L, catch, M, and shaft, B, signal, A, and weight, B', or its equivalent (P P1 P2 Q), substantially as and for the purpose specified.

3d, The arrangement of the trigger, E', rock shaft, F' f', arm, H', and rod or other suitable connection, N, all arranged and operating substantially as and for the purpose set forth.

4th, The combination, with the disk or signal, A, of the reflecting plate, a substantially as and for the object stated.

71,897.—SPINNING WHEEL.—Henry Miller, Ronald Township, Mich.

I claim the arrangement of the adjustable and hinged rods and levers, constructed as herein described, for connecting the rocking treadle with the

hinged spindle arm, so that the operator, by the foot, may move the spindle arm out or in at pleasure, as set forth and represented.

71,898.—BOOTS AND SHOES.—Charles Mole, Pembroke Terrace, Regent's Park, London, England.

I claim the manufacture of a movable boot heel in two parts, to be adjusted in different positions by means of a single central projection taking into a single slot hole or countersunk part, and secured in position by means of a central screw or pin, whether such projection and hole or countersunk part be square or many-sided, and no matter what the shape of these sides, so that the shape of the projection and that of the hole which is to receive it be identical, the whole substantially as hereinbefore described and illustrated on the annexed sheet of drawing.

71,899.—WATER COOLER AND REFRIGERATOR.—Alfred Murden and Henry L. Cooper (assignors to themselves and Francis Warner), New Haven, Conn.

We claim the arrangement of the cylinder, A, and outer cylinder, C, so as to form a water space, D, and combined with covers, E and G, so as to form a chamber, F, above the water space, D, and ice cylinder, A, so that the cover, E, forms the bottom of and the cover, G, the top of the said chamber, in the manner and for the purpose herein set forth.

71,900.—CONSTRUCTION OF STAMPED SHEET METAL KETTLES.—Frederic G. Niedringhaus and William F. Niedringhaus, St. Louis, Mo.

We claim the spout of a kettle when formed by pressure from the bottom and top plate of the kettle, when constructed substantially as shown and specified.

71,901.—BREAST STRAP SLIDE.—O. B. North (assignor to O. B. North & Co.), New Haven, Conn.

I claim, 1st, The arrangement of the hinged tongue, E, upon the plate, A, so as to cover the ring, substantially in the manner herein set forth.

2d, Constructing the hook or projection, D, upon the inside of the plate, by forming an opening, C, through the plate, substantially as and for the purpose herein set forth.

71,902.—SNOW PLOW.—Abel Nutting, Quincy, Mass.

I claim the rotary plow, arranged to operate substantially as set forth.

Also, in combination with such a plow, inclines, or shares, fixed, with respect to the frame by which they are supported, substantially as described.

71,903.—STEAM GENERATOR.—Isaac R. Oakford, Philadelphia, Pa.

I claim a steam generator, composed of a series of cylindrical boilers, of round ends, provided with openings for steam and water, and arranged in a vertical and inclined position, in the manner and for the purpose above set forth and described.

71,904.—CASTER FOR FURNITURE.—P. B. O'Brien and Wm. E. Sparks, New Haven, Conn., assignors to P. B. O'Brien.

We claim the arrangement of the spring, a, in the spindle, B, and combined with the socket, C, so as to operate in the manner substantially as described.

71,905.—RAILWAY FROG.—Staats N. Park, Bloomsbury, N. J.

I claim, 1st, So constructing the frogs of railways that the frog plate and the rail or track sections, guard rails, and frog point are separate from each other, and so that the rail sections and guard rails and frog point can be inserted in or attached to and detached from the frog plate, for the uses and purposes set forth.

2d, So constructing the frogs of railways or the frog plate, that the track rails of any railway can be extended upon and combined with such frog plate to form the track or rail section of the frog, substantially as and for the purposes set forth.

71,906.—HARVESTER.—Henry W. Pell, Rome, N. Y.

I claim, 1st, The carriage, C, supported at both ends on wheels or rollers, c c, running on a guide way, S, substantially as and for the purposes specified.

2d, The rib or groove joint between the friction rollers and guide-way, to sustain the lateral pressure, as set forth.

3d, The clevis pin or whiffletree bolt, B, attached to the center of the carriage, C.

4th, The independent attachment of the draught clevis to the whiffletree bolt to permit the independent oscillation of the whiffletree without affecting the clevis.

71,907.—MEDICAL COMPOUND.—M. Perl, New Orleans, La.

I claim the medical compound herein described, when made by the process and composed of the ingredients herein specified, in the proportions stated, for the purpose set forth.

71,908.—MACHINERY FOR SHAVING AND SLOTTING SCREWS.—Elijah S. Pierce, Hartford, Conn.

I claim, 1st, The combination of the cam, M, the sliding frame, Y, the spindle, A, the pulley, P, the clamp, C, the spring, S, and the rest, R, or their equivalents, with a shaving tool, and one or more nicking saws, substantially as herein specified.

2d, The combination of the sliding frame, Y, the spindle, A, and the clamping device, C, with a shaving tool and one or more saws, substantially as described, for the purpose of shaving, nicking, and turning screw blanks or other similar articles, while held in the same jaws.

71,909.—DOUBLE SCREW.—Elijah S. Pierce, Hartford, Ct.

I claim the double screw herein described and shown, as a new article of manufacture.

71,910.—APPARATUS FOR PRESERVING MEATS, FISH, POULTRY, AND OTHER PERISHABLE ARTICLES.—Charles F. Pike, Providence, R. I.

I claim, 1st, Constructing a tubular ice box, with holes or openings in the tubes or pipes, at or near the bottom, to let the air out into the chamber, F, and slots or openings into the ice receptacle, reservoir, or depository, near the top, and so get the combined and double purpose of radiation, conduction, and internal circulation of the air in the chamber, F, substantially as and for the purposes set forth and described in the drawing and specification hereunto annexed, without confining myself to any particular form, size, or shape of the pipes or tubes, whether they be vertical or horizontal, round, square, oval, oblong, or in any other form, neither do I confine myself to any particular form of ice receptacle, reservoir, or depository.

2d, The perforating or making slots, holes, or openings in the tubes or pipes, near the bottom, for the purposes set forth and described, howsoever the same may be made, whether used in connection with the ice receptacle, reservoir, or depository, as described, or without the openings in the ice receptacle, reservoir, or depository, for the purpose of the rotating of the air

3d, The ice receptacle, reservoir or depository, with its openings to let the air into and on to the ice in this ice receptacle, reservoir, or depository, for the purpose of taking off the moisture in the preserving room, at or near its top, whether the tubes connected to the bottom of this ice receptacle, reservoir, or depository, are perforated or not, or whether the ice receptacle reservoir, or depository, is removed altogether, and the tops or collars of the tubes or pipes are perforated.

4th, The ice box, receptacle, reservoir, or depository, A, as described, pipes or tubes, B C D L, pan, E H, room, F, substantially as described and set forth, with their appendages.

71,911.—MULTIPLYING REFLECTORS FOR PHOTOGRAPHIC CAMERA.—D. W. S. Rawson, Peru, Ill.

I claim, 1st, The reflector box, A, the doors and shade wings, B B, the bars, C C, the non-reflecting division, D D, surrounding and between the several mirrors, the base board, F, and the slide board, G, and the double pivot, H, when used for the purposes herein described.

2d, The use of the lever for the purpose of adjusting the reflectors.

3d, The moving of the reflectors with the slide, G, to produce more than one set of impressions on the same plate, or an equivalent movement.

71,912.—CAR SPRING.—Wm. F. Ray, Fort Wayne, Ind.

I claim a series of reflexed springs, so constructed that the bows slide into each other, the whole being adjustable so as to regulate the amount of elasticity, as described.

71,913.—LAMP BURNER.—Henry Read, Providence, R. I.

I claim the skeleton bottom, B, in combination with the perforated cylinder, C, and cone, D, when constructed and arranged substantially as described and for the purpose specified.

71,914.—APPARATUS FOR TAMING WILD ANIMALS.—Peter R. Sanderson, Caledonia, N. Y.

I claim the construction and use of a circingle strap, as described, with the sheaves, A A A A, and their attachments to said circingle, and the slipping straps, B B B B, and rope, C, when arranged substantially as described for the purpose specified.

Also, the combination of the above parts, A A, etc., B B, etc., and C, with any harness, arranged substantially as described for the purpose designed.

71,915.—JOURNAL BOX.—Wm. Sherburne, Charlestown, Mass.

I claim, 1st, The bolt, E, constructed as and for the purposes above described.

2d, The bolt, E, in combination with the jaw, m, and oil box, B, substantially and for the purpose above specified.

71,916.—HORSE AND CATTLE POKE.—Nelson Sylvester, Weymouth, Ohio.

I claim, 1st, The head, B, cross bar, E, in combination with the springs, F, and spikes, a, for the purpose and in the manner substantially as set forth.

2d, The cross bar, E, as arranged in relation to the yoke, C, and in combination with the poke, A, in the manner as and for the purpose specified.

71,917.—CORN PLANTER.—Frank J. Smiley, Marshall, Mich.

I claim, 1st, In combination with a wheeled machine for planting corn or other seed at regular intervals, a "perambulator," substantially as described, when hung concentrically to a revolving seed cylinder, C, and operated in connection therewith, substantially in the manner and for the purpose herein specified.

2d, When operated in connection with a revolving seed cylinder, the arrangement and combination of the dropping tubes, t, and their attachments with the tappet pins, T, and receiving basins, K, for dropping and conveying the seed to the furrowers, substantially as set forth.

3d, The pendant gage-bars, h, in combination with the gage-plates, g, substantially as and for the purpose described.

71,918.—WHIP RACK.—Charles A. Smith, Philadelphia, Pa.

I claim a whip rack composed of metal or other inelastic material, and furnished with a series of divisions or apartments, with a hinged tongue or flap in each, and suitable openings in each apartment for the insertion and retention of a whip, substantially as described.

71,919.—METHOD OF HARDENING AND BLEACHING ARTICLES MADE OF SOAPSTONE, TALC, ETC.—Henry Julius Smith, Boston, Mass., assignor to Joseph C. Wightman Newtonville, N. Y.

I claim, 1st, The heating in a closed vessel, and in contact with carbon, the above described substances, or articles formed therefrom, for the purpose of hardening and toughening the same, substantially as above described.

2d, The removal, either before or after the hardening process, of impurities producing discoloration, by the action of a bath of melted chloride of sodium, or other chemical compound operating in like manner.

71,920.—HANDLE FOR TEA AND COFFEE POTS.—Enos E. Stow, Plantsville, Ct.

I claim a handle, as made hollow or tubular, and provided with openings in or through it, that when applied to a pot or vessel, warm or heated air may be caused to pass into and through and out of such handle, substantially as and for the purpose specified.

71,921.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the endless wire rope or ropes, A A, pulleys, T T' T", and piers, B B B' B", with the suspended carriages, H H H H, arranged and operating as specified.

71,922.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the wire ropes, A A, piers, B B B B, reel, F, and rope, P, with the carriage, H, arranged and operating in the manner set forth.

71,923.—AERIAL CARRIAGE AND WAY.—Daniel Towse, Pittsburg, Pa.

I claim the combination of the two aerial ways, A A' A" A'", the drum, C, with the carriages, H H, and ropes, f f, constructed and operating as specified.

71,924.—ATTACHMENT TO THE REGULATORS OF WATCHES.—Wm. B. Tucker, Hillsboro, Ohio.

I claim the combination of the screw-arbor, c, and the toothed segment, e, with the regulating lever, d, and the scale base plate, a b, substantially in the manner and for the purpose herein set forth.

71,925.—BILLIARD CUE TIP.—Joseph A. Veazie, Boston, Mass.

I claim the new or improved composition, substantially as described, in which ground leather is an important constituent.

Also, the combination of a layer of such composition and one or more layers or strata of leather or caoutchouc, or both, such being for the formation of cue tips, as explained.

71,926.—CAR SPRING.—Richard Vose, New York city.

I claim a volute spring, formed or constructed of a coiled metallic bar, whose thickness is greater transversely upon one edge thereof than at any other point therein, substantially as and for the purpose herein set forth.

71,927.—APPARATUS FOR TURNING ON GAS.—W. P. Wage [assignor to himself and M. Clarke), Barre Centre, N. Y.

I claim, 1st, The cylinder, E, and the piston, F, in combination with the lever, D, or their equivalent, operated by the means and in the manner and for the purpose specified.

2d, Lighting gas by electricity, in combination with the apparatus above described for turning on gas, as shown and described.

71,928.—HORSE HAY FORK.—George H. Waldo, Prattsburg, N. Y.

I claim the tines, b b, bail, f f, curved holding tine, I, spring, J, pulley, l, rope, k, all constructed and operated substantially as herein set forth.

91,929.—MACHINE FOR ROLLING LEATHER.—J. H. Walker, Worcester, Mass.

I claim, 1st, The combination of the horizontal way, G, slide, H, and roll, b, with tables, K and M, and treadle operating device, substantially as and for the purposes set forth.

2d, The combination, with the pieces, C C, of the truss rods, E E, bridge, F, way, G, and slide, H, substantially as and for the purposes set forth.

71,930.—FERTILIZER AND CORN PLANTER COMBINED.—Samuel H. Wallize, Washingtonville, Pa.

I claim the arrangement of the devices, slide, G, and roller, D, as connected and operating together, with the crank, F, so as to drop the guano and corn through a single spout, to prevent choking, as herein described.

71,931.—WASHING MACHINE.—D. T. Ward, Cardington, O.

I claim, 1st, The segmental or convex wash board, E, actuated by levers, D, in combination with the reciprocating washboard, F, and connecting arms, H, substantially in the manner and for the purpose set forth.

2d, In combination therewith, the spring, J, rod, k, and slots, l, arranged and operating substantially as described.

3d, The gate, p, in combination with the horizontal reciprocating wash board, F, and tub, A, arranged and operating substantially as and for the purpose set forth.

71,932.—CORN PLANTER.—John R. Weber, Bourbon, Ind.

I claim, 1st, The springs, m, on the shaft, e, in combination with the dropping cylinders, k, as and for the purpose described.

2d, The combination of the foot board, c', forked lever, d" m", connecting rods, e", and cross piece, h", arranged and operating as explained.

3d, The combination of the frame, B, elbow levers, m', connecting rods, n's', arms, o' t', and shafts, r' n', as and for the purpose set forth.

4th, The combination of the transverse shaft, v, sliding bar, s, hook, r, pins, o, block, n, and dropping cylinders, k, substantially as described.

5th, The combination of the crank, w, arm, x a', spring, b', and sliding bar, s, arranged and operating as set forth.

6th, The combination of the lever, a", shaft, v, pinion, e', and spring, e"', when used independently, or in connection with the frame, B, substantially as and for the purpose described.

71,933.—BED BOTTOM.—David S. Williams, Coldwater, Mich.

I claim the combination of the loop, A, rods, B, spring band, C, rods, D, webbing, E, slats, F, wires or equivalent, G, in the manner described.

71,934.—INSTRUMENT FOR ADMINISTRATION OF ANÆSTHETICS.—Osborn Wilson, Aurora, Ill.

I claim, 1st, The construction of an instrument with inhaling and exhaling tubes, provided with valves, working automatically and alternately in opening and closing the tubes by the respiration of the patient, substantially in the manner and for the purposes as herein specified.

2d, Providing the instrument with a spring valve and air tube for regulating the administration of the nitrous oxide and other anæsthetics, substantially in the manner and for the purposes as herein specified.

3d, The construction and arrangement of stock, A, mouth piece, B, inhaling and exhaling tubes, C' C, plate, D, air tube, E', valve, E, spiral spring, b, valves, c c, rods, d d, fulcra, e e, arm, f, and rod, g, substantially in the manner and for the purposes as herein specified.

71,935.—CIDER MILL AND PRESS.—Martin Winger, Ephrata, Pa.

I claim, 1st, A series of press boxes, D, with perforated sides and an external cogged flange, d, all connected in the form of a wheel revolving horizontally, with its cross-arms, N, secured centrally to a vertical shaft, L, in combination with the bearing, M, and step, O, sustained on a framework, A B B', all arranged substantially in the manner and for the purpose specified.

2d, With the revolving press boxes, D, the press block and central upright, K, E, pulley, G, guides, F, arms, e, in combination with the inclined planes, H and R, all arranged and operating substantially in the manner and for the purpose specified.

3d, In combination with the revolving box wheel, D D N N, and pressing arrangement, the hinged drop bottom, Q, in combination with a series of rollers or pulleys, P, or their equivalents, for the purpose and in the manner shown and described.

4th, In combination with my horizontal box-wheel, the arrangement of the gearing and mill hopper, X, and crushers, W V, pinions, Y S, on shaft, all combined substantially in the manner specified.

5th, In combination with an apple mill, a cider press, with a series of presses in a horizontal revolving wheel, substantially as and for the purposes specified.

71,936.—CURB FOR WATER WHEEL.—Albert Winton, Chambersburg, Pa.

I claim, 1st, The serpentine or double curved chute gates, O O, when formed with surfaces tapering or sloping from their centers towards their ends, and so arranged, relative to intermediately situated diaphragms or plates, r r, that one of the tapering ends of said chute gates, O O, shall project beyond the circumferences of the rims, a a e e, and extend so as to enter slots, or between the prongs of fork like arms, K L K L, to be operated in the manner and for the purpose substantially as described.

2d, The annular adjustable rim, or ring, l l, provided with the fork like arms, K L K L, and with the moving lever or crank, m, and the fulcrum pin, h, all arranged to operate the chute gates, O O, substantially as shown and described.

71,937.—HARVESTER—James Winters and Charles C. Gapen, Lacon, Ill.

We claim the skeleton frame, A, or its equivalent, provided with an adjustable clevis, and attached to the end of the tongue, or reaping and mowing machines, substantially in the manner and for the purpose herein described and represented

71,938.—SASH TOP.—Orson E. Woodbury, Madison, Wis.

I claim, 1st, The cam, slotted at B D I, forming bearings at either extremity for the screw or other support, when the cam is operating against the catch, C, at the points, F or O, all as described and for the purpose specified.

2d, The catch, C, with the spikes, G G, constructed and used as and for the purposes hereinbefore named.

71,939.—PEAT AND BRICK MACHINE.—Charles D. Wrightington, Fairhaven, and Benjamin P. Rider, Boston, Mass.

We claim, 1st, In combination with the mold wheel having the series or sets of molds in it, a series of plungers revolving with said wheel and operated in succession by the eccentric journal and frame, Q, substantially as and for the purpose described.

2d, Also in combination with a mold wheel having a series of cogs interposed by a series of concave stops, blanks or abutments upon its periphery, a drive wheel having cogs and a blank surface on its perimeter so that the mold wheel may be moved, stopped and locked by said drive wheel which has a continuous movement, substantially as and for the purpose described.

3d, Also the location and arrangement of the cam over and around the blank on the perimeter of the drive wheel so that while the mold wheel is stopped and locked by said drive wheel which continues its movement said drive wheel shall operate the pushers to discharge the pressed bricks or blocks from the molds, substantially as described.

71,940.—TOY.—Derrick Adams, Lansingburg, N. Y.

I claim an automatic toy having the legs of the horse and the head and arm of the driver actuated by mechanical devices, in manner substantially as herein described and for the purposes as set forth.

71,941.—EAVES TROUGH FASTENING.—Philip Ahn, Brandon, Vt.

I claim the bolt, c, combined with the elastic strap, e, substantially as and for the purpose described.

71,942.—INFLATING RUBBER BALLS.—Henry A. Alden, Fishkill, N. Y., assignor to the New York Rubber Company.

I claim the application to rubber balls or other hollow articles requiring to be distended by inflation of the combined bulb and tube, substantially in the manner and for the purposes herein shown and set forth.

71,943.—REAMER.—Charles Allardice, Cohocs, N. Y.

I claim, 1st, A shank, A, formed substantially as described in combination with the cutters, B, and nut or screw ring, C, the whole operating as set forth.

2d, In combination with the shank, A, cutters, B, and nut, C, the nut, e, bolt, g, and washer, g', formed as described and employed for the purposes specified.

71,944.—BOLT ATTACHMENT TO DOOR LOCK.—William H. Andrews (assignor to Burton Mallory), New Haven, Conn.

I claim the bolt, E, constructed and arranged within the lock case in combination with the follower, F, constructed with a cam, i, and spring, H, so as to hold the bolt securely in both its locked and unlocked position, substantially in the manner herein set forth.

71,945.—MECHANISM FOR PRESENTING PALM LEAF TO LOOMS.—Isaac Angell, Malden, Mass.

I claim for employment in connection with a loom for weaving with palm leaf or similar web a mechanism substantially as set forth which successively presents in succession the entering ends or single pieces of weft in such position with relation to the cross sectional form of each that each piece will be carried into the shed or web flatwise.

Also the mechanism for effecting the elevation and release of the weft, substantially as described.

Also the plate, d, with its rectangular perforations and the gate or slide for clamping a single piece of weft projecting through the plate, substantially as shown and described.

Also a mechanism substantially as set forth for "knocking off" the weft raising mechanism when a piece of weft is presented.

71,946.—BLACKBOARD FOR SCHOOLS.—William Arroquuier, Worcester, Mass.

I claim covering the plaster, B, with a coating, C, composed of the ingredients named and applied in the manner above described whereby the proper color and roughness are obtained, as set forth.

71,947.—MODE OF OPERATING SWELL IN MELODEONS.—C. E. Bacon [assignor to himself, George A. Prince and Calvin F. S. Thomas], Buffalo, N. Y.

I claim the arrangement of the swell pedals side by side with the bellows pedals and contiguous to and parallel therewith, for the purpose and substantially as described.

71,948.—MATERIALS FOR TRANSMITTING HEAT.—William C. Baker, New York city.

I claim the employment of salted water, glycerin, or their equivalents, to prevent freezing in transmitting and diffusing heat through ordinary pipes, tubes or radiators for the purpose of warming and ventilating railroad cars, public vehicles and buildings, substantially as herein described.

71,949.—LAMP BURNER.—George E. Baldwin (assignor to E. Miller & Co.), West Meriden, Conn.

I claim the arrangement of the auxiliary or ventilating tube, E, with the wick tube, B, combined with a solid partition, F, in the base of the burner so as to form a close chamber around the tubes and wick adjuster, substantially in the manner and for the purpose herein set forth.

71,950.—AUTOMATIC TOOTH PLUGGER.—Burr Bannister and George F. Green, Kalamazoo, Mich.

We claim, 1st, The combination of an engine operated by means of compressed air with a tooth plugger, for the purpose set forth and described.

2d, The lock, F, in connection with spring, I, operated by cross head of piston rod, in the manner and for the purpose specified.

71,951.—CAR COUPLING.—William F. Barlow (assignor to himself, James Bower and W. A. Jackson), Monmouth, Ill.

I claim, 1st, The catch, C, slotted draw head, A, and weight, X, combined as described and for the purpose set forth.

2d, The rods, M N and H, and elbow, K, combined as described and operating in combination with the elements of the first claim arranged substantially as described and for the purpose set forth.

3d, The weight, X, arranged as described for the purpose set forth.

71,952.—HARVESTER RAKE.—John Barnes, Rockford, Ill.

I claim, 1st, The inclined serrations, h h h, on the face of the rake head for the purpose of compacting the gavel.

2d, A compresser or supplementary rake pivoted to the rake handle and moving parallel to the rake head, substantially as described.

3d, The combination substantially as described of an automatic rake, a compresser and an interposed spring, for the purpose set forth.

4th, The combination substantially as described of a reel revolving continuously on a horizontal shaft a rake mounted on the same shaft (on trunnions arranged diagonally to the shaft), and a shipping device by which the rake may be thrown into gear between any two of the beaters of the reel and by which it may automatically be thrown out of gear at the end of its stroke.

5th, The combination substantially as described of the inclined rake handle with the trunnions or pivots revolving on the reel shaft and arranged diagonally thereto.

6th, The combination substantially as described of the rake handle pivoted on trunnions diagonal to the reel shaft and the friction roller with a guide vertical below the axis of the rake and deflected both horizontally and laterally above that axis, as and for the purpose set forth.

7th, The combination substantially as described of the rake handle and shipping lever whereby the rake throws itself out of gear after discharging the gavel.

8th, The combination substantially as described of a rake mounted on trunnions revolving on a horizontal axis in a fixed relation to the guide which controls the movements of the rake with a revolving reel having an endwise movement on the same axis whereby the rake can be thrown out of gear by moving the reel endwise without stopping the reel.

71,953.—TRY SQUARE AND BEVEL.—Samuel N. Batchelder, Prairie du Chien, Wis.

I claim, 1st, The blade, B, pivoted within the stock, A, and provided with a hooked projection, e, by means of which and the hook slide, D, the blade, B, may be set and held at any desired angle, substantially as described and for the purpose specified.

2d, The hook slide, D, with the thumb screw, E, arranged and operating substantially as shown and described for the purposes set forth.

3d, The spiral spring, F, in combination with a combined try square and bevel, substantially as described.

71,954.—PLATE LIFTER.—David B. Beaty, Anrora, Ind., assignor to himself and James Lamb.

I claim the curved wires, B B B, having hooks at their lower ends and connected to a handle, A, said handle being provided with a wire loop formed into a spring which connects to the wires, B, so that by pressing upon this spring, C, the wires, B, are caused to separate and release the plate, all constructed as specified.

71,955.—SUSPENSION BRIDGE.—Charles Bender, N. Y. city.

I claim, 1st, The construction and arrangement of one or more yielding joints connecting the beams or trusses of stiffened suspension bridges, substantially as herein described.

2d, The attachment of the ends of the cables or chains at or near the first or shore piers to the longitudinal beams or trusses of stiffened suspension bridges, substantially as set forth.

3d, The means and method by which the ends of the beams or trusses of stiffened suspension bridges are secured to the shore piers by vertical anchorage and the arrangement of suitable joints, v, in said anchors, substantially for the purpose described.

4th, The means and method employed to reduce the side motion by attaching the longitudinal beams or trusses of stiffened suspension bridges to the central piers sidewise said attachment being on one pier perfectly immovable in any horizontal direction while at the other piers allowance is made for the variations of the length of the beams, substantially as set forth and described

71,956.—FOLDING TRUNK.—O. K. Bernbaum, Brooklyn, N. Y.

I claim the folding ends in combination with the hinged sectional back and front, for the purposes herein fully described

71,957.—SOFA BEDSTEAD.—Charles H. Berry, East Somerville, Mass.

I claim the combination of the lower portion, a, the seat, b, and head, d, and the hinged or movable panel, e, in a sofa or lounge, substantially as and for the purpose described.

71,958.—CHURN.—Thomas Bisbing, Buckstown, Pa.

I claim the combination of the removable frame, B, sliding frame, C, ratchet bar, G, and pinion wheel, H, with each other, with the body, A, of the churn, and with the dasher shaft, I, substantially as herein shown and described and for the purpose set forth.

71,959.—HAT-FELTING MACHINE.—Job W. Blackham, Brooklyn, N. Y.

I claim, 1st, The duplicate series of rolls, b and b', and rubbers, C and C', or their equivalent, with their water pans, N N', and jets of hot water or steam, as represented, arranged to operate together in the manner and for the purpose herein specified.

2d, Mounting the reciprocating rubber over the bed of rolls so as to allow of its ascent and descent by means of springs, substantially as and for the purpose herein specified.

71,960.—BUILDERS' SCAFFOLD.—John E. Bliss, Oxford, Ind.

I claim the combination of the right-angled pivoted frame, A, and adjustable sliding bars, B and D, with each other, substantially as herein shown and described and for the purpose set forth.

71,961.—SUBSTITUTE FOR MILK FOR CATTLE.—Rufus K. Blodgett, near Fulton Ill.

I claim, 1st, The use of white or blue clay, when used for the purpose above specified.

2d, The combination of flour, catechu and clay, when mixed and used for the purposes above set forth.

71,962.—FIRE LADDER.—Johan Blomgren, Galesburg, Ill.

I claim, 1st, The stuffing coil, O, inserted into the lower part of the tube H H', and forced up or down in the tube by the cog wheel, M, substantially as and for the purpose specified.

2d, The basket, R, in combination with a fire escape having the hinged side, T, and the adjusting rod, S, substantially as and for the purpose described.

3d, The construction of the stuffing coil, O, substantially as and for the purpose specified.

71,963.—SAFETY GUN LOCK.—Charles Bowlen, Milwaukee, Wis.

I claim tumbler, F, with its pin, G, in combination with dog, H, with its slot, I, substantially as and for the purpose described.

71,964.—VENTILATOR FOR BUILDINGS.—Thomas Boyd, Cambridgeport, Mass.

I claim, 1st, The combination of the chamber, A, with or without the lenses, B, cone, C, and rods, D, constructed and arranged to operate substantially as and for the purpose set forth.

2d, The combination of the oscillating cap, E, and elastic pads, I, substantially as and for the purpose set forth.

3d, The arrangement of the chamber, A, cone, C, pipes, E and H, and cones, G and K, substantially as set forth.

71,965.—DOOR LATCH.—Purmort Bradford (assignor to Sargent & Co.), New Haven, Conn.

I claim the construction of the latch bolt with the pivot bearings, a and b, upon opposite sides combined with a single central pivot upon the plate so as to be adjustable for a right or left-hand door and the said plate constructed with a slot through which the latch is operated, in the manner herein set forth.

71,966.—PLOW.—Harvey Briggs, Smithland, Ky.

I claim, 1st, Forming the land side, mold board frame and upper and lower strengthening floors, b1 and b2, solid in one piece B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the conical rollers, D, and their boxing frame, H, with the mold board frame, B, substantially as herein shown and described and for the purpose set forth.

3d, Forming the boxing frame, H, in two parts, substantially as herein shown and described and for the purpose set forth.

4th, Forming an oil trench or channel, J, in the boxing frame, H, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the elastic washer or packing, I, with the journals and bearings of the rollers and wheels, substantially as herein shown and described and for the purpose set forth.

6th, The combination of the adjustable friction wheel, F, and stationary friction wheel, E, with the solid land side and mold board frame B, substantially as herein shown and described and for the purpose set forth.

7th, The combination of the vertical flanged friction roller, G, with the land side of the plow, substantially as herein shown and described and for the purpose set forth.

71,967.—PIANO STOOL.—Joshua Briggs, Peterboro, N. H.

I claim, in combination with the pillar and feet, the socket block, m, having recesses formed with side lips or flanges, o, to fit into grooves, q, in the feet and bottom seats, p, between which and the shoulder on the pillar the feet are securely confined, substantially as described.

Also the center piece, w', fitting upon and covering the screw bolt and nut, which confine the pillar to the base, substantially as shown and described.

Also constructing the socket block, m, with a center socket, t, into which the tail piece of the pillar fits and is confined, substantially as described.

Also making the screw spindle removable from the seat, substantially as set forth.

71,968.—PLOW.—T. E. C. Brinly, Louisville, Ky.

I claim, 1st, The mode of attaching the beam, D, to the plows by a socket, C, connected with the land side by braces, B B, substantially as set forth.

2d, The combination of the socket, C, constructed with diagonal flanges, C', the handles, and the beam, substantially as set forth.

71,969.—COMBINED SHOVEL AND SIFTER.—Stephen P. Brooks (assignor to himself and Benjamin Woodward), Somerville, Mass.

I claim the within-described combined shovel and sifter, constructed and operating substantially as set forth.

71,970.—SEAT AND DESK.—A. H. Brown, May's Landing, N. J.

I claim the hinged brace, J, passing through the guides, M, upon the inside of the ends, B, of the seat and hinged to the outer edge of the folding desk, H, all arranged as described whereby the gravity of the brace, J, as the desk is raised causes the L-shaped notch, L, to fit and catch in the guide, M, to hold the said desk raised, for the purpose specified.

71,971.—GRAIN FORK.—E. G. Bullis, Manchester, Iowa, assignor to Charles J. Riggs, same place, and said Riggs assignor to D. E. Lyon, Dubuque, Iowa.

I claim, 1st, The combination of a band-cutting device with a pitching fork, substantially as and for the purposes described.

2d, The combination of the rearwardly-extended parts of the tines, C, the cross head, B, grooved bars, E, sliding cutter, F, and springs, L, with each other, substantially as herein shown and described and for the purpose set forth.

71,972.—SEED PLANTER.—Matthew S. Burdick, Milton, Wis., assignor to himself and John M. May.

I claim, 1st, Thumb screw, I, in combination with part, H, and seed cup bar, D, when constructed, connected together and used substantially as and for the purposes described.

2d, Seed-cup bar, E, or its equivalent, when combined with seed-cup bar, D, in the same planting machine so that corn and pumpkin seed and other flat seeds, as squash and melon seeds, may be planted at one operation, substantially as described.

3d, Spring, O, or its equivalent, attached to and combined with seed-cup bar, E, substantially as and for the purposes described.

4th, Jaws or points, F and G, provided with partitions, h and h, for the purpose of dividing the seed, when used in combination with parts, A and A' B and E and N, substantially as described.

5th, A general arrangement and combination of legs or bars, A and A', hoppers, B and C, seed-cup bars, D and E, covering, N, and jaws, F and G, when constructed, connected together and used substantially as and for the purposes described.

71,973.—PULLEY BLOCK.—John A. Burnap, Albany, N. Y.

I claim the arrangement of the frame, E, and pulley, F, through the eye of which is inserted the frame, A, having a series of rollers, a a, the whole constructed and used substantially as specified.

71,974.—SADIRON.—Jesse S. Butterfield and Joseph A. Reed, Philadelphia, Pa.

We claim, 1st, The steadying pin, d", in combination with the sectors, d'" d'", on the guard-plate, d', the said parts being constructed and arranged to operate in connection with the places, a'" a'", on the projection, a', substantially as and for the purpose described.

2d, The projection, a', on the base, A B, with its two opposite sectors or inclined planes, a" a", constructed and arranged to receive and hold down the inward ends, c" c", of the feet of the handle, C D, substantially as described and set forth.

3d, The projecting ends, c" c", of the handle, C D, constructed and arranged to operate in combination with the spaces, b' b', and planes, a" a", substantially as and for the purpose described.

71,975.—PRUNING SHEAR.—Seth P. Carpenter, Milford, Mass.

I claim the new or improved manufacture of pruning shears, as hereinbefore described, that is, as composed of the blades, a b, the lever, C, the long shank, B, the lever, D, the open handles, C C', the arm, f, and the rod, g, arranged and combined in manner, and for the purpose, and to operate substantially as specified.

71,976.—WASHSTAND AND CLOTHES DRYER.—Frances H. Carrier, Bridgeport, Conn.

I claim, 1st, The combination of the clothes drying apparatus with the wash-basin, when they are constructed, arranged, and fitted for use substantially as herein described and set forth.

2d, The combination of the cups, b c d, or their equivalents, with the wash basin, when they are constructed, arranged, and fitted for use as a toilet apparatus, substantially as herein described and set forth.

71,977.—SPICE CASE.—John T. Carter and John Park, Lowell Mass.

We claim, 1st, The cups or boxes, c c, when arranged to operate substantially as described, and for the purposes fully set forth.

2d, The springs, k k, in combination with the cups or boxes, c c, for the purpose described and set forth.

3d, The combination and arrangement of the case, a, with its feet, d d d, handle, e, loop, f, and shelves, b b b b, cups or boxes, c c, and spring, k k, all all for the purposes substantially as described and set forth.

71,978.—APPARATUS FOR PAINTING OR GRAINING PAILS, ETC.—Jonathan Carter, Winchendon, Mass.

I claim, 1st, The combination of the flexible painting or die printing roll with the supplying roller, for painting, graining, ornamenting pails, or other tapering articles.

2d, The mechanism for holding and revolving the pail, when mounted on a bench or table, in combination with the movable printing or die roll, operating substantially in the manner as and for the purposes set forth.

3d, Casting graining or other ornamental configurations on conical rolls so as to form a continuous body, for the purposes herein described.

4th, Making die or printing conical rolls in sections, and securing them to the staves so as to change their position for making a greater variety of ornamental designs for graining and ornamenting hollow ware, substantially as and for the purposes set forth.

5th, Applying a smooth coat or body of paint or varnish with a flexible roller to pails, tubs, or other articles of hollow ware, substantially in the manner herein set forth.

71,979.—SAWYERS' RULE.—Thos. Carter, Louisville, Ky.

I claim, 1st, A scale so constructed and adjusted that any two of the three quantities of the thickness of the planks, the diameter of the log, and the number of the planks cut or to be cut from the log being given, the third of said quantities is read off from the scale in the manner substantially as above set forth and described.

2d, A scale exhibiting the number of turns to be given to the screws of the log carriage for cutting plank or boards of any desired thickness.

71,980.—CAST METAL CASE FOR SPRING BALANCE.—John Chatillon, New York city.

I claim a cast metal case for spring balances, when provided with a perforated or slotted upper head for the reception of the pin, b, and when made substantially as and for the purpose herein shown and described.

71,981.—VACUUM GRAIN DRYER.—Geo. Clark, Buffalo, N. Y.

I claim, 1st, The three essential features or parts: the air tight grain chamber, the radiating heating pipes or floors, and the vacuum-producing apparatus, combined and operating substantially as herein set forth.

2d, The arrangement of the steam heating pipes within the grain chamber, substantially as set forth.

3d, The graduated gage vessel, H, arranged as and for the purpose set forth.

71,982.—DOOR LATCH.—Francis Clymer, Galion, Ohio.

I claim the mode of attaching a combined latch and hasp, B, and staple, F, to doors, by means of slots, I and H, so as to permit the adjustment of the same substantially as set forth.

71,983.—CLAMP.—Geo. H. Coe and Geo. H. Snow, New Haven, Conn.

We claim the herein described clamp, consisting of the head, C, upon one arm of the body, A, the opposite arm, provided with a corresponding foot, and the said head having arranged therein levers, D, and combined with a screw, B, so as to operate to clamp between the screw and the foot, substantially as set forth.

71,984.—BOAT DETACHING TACKLE.—David L. Cohen, Pensacola, Fla.

I claim the combination of the notched bars, a a, with the grooved blocks, B B, the sliding blocks, C, pitman, D D', and lever, F, substantially as and for the purpose described.

71,985.—APPARATUS FOR ELEVATING WATER.—J. R. Cole, Keston Station, Tenn.

I claim, 1st, The combination of the chamber, F, provided with the short pipes, p p', and the pipes, p", with the pumps, G H, and the chambers, C D E, substantially as and for the purposes described.

2d, The combination and arrangement, for the purpose described, of the chambers, C D E F, pipes, p p' p", P P' P'", and pumps, G H, the latter working alternately, so as to maintain a constant pressure upon the water in the chambers, substantially in the manner specified.

71,986.—TACK HAMMER.—Thomas A. Conklin, New Britain, Conn.

I claim, as a new article of manufacture, a tack hammer, constructed in the manner and with the characteristics herein specified, for the purposes set forth.

71,987.—FLOOR CLAMP.—Wm. Conner and C. W. Mitchell, Wilmington, Del.

We claim the combination of the frame, a, with the screws, b and d d, with the wedge blocks, e e, wedges, f f, and plates, i i, constructed and arranged, as herein described, to operate as a clamp for clamping ship timber, flooring, and other carpenters' work.

71,988.—BUTTON.—Geo. Cooke, Winchester, Mass.

I claim a button or stud, its shank attached by means of a disk formed concave, and subsequently compressed, substantially as described.

71,989.—HARVESTER.—Francis C. Coppage, Terre Haute, Ind.

I claim, 1st, The combination of the double or alternate step wheel, E, having the inclined steps, e e e, with the two stepping-dogs, D D', and the springs, x x, when the said parts are constructed and arranged substantially in the manner and for the purposes described.

2d, The combination and arrangement of the adjusting rod, n o", with the cylindrical sleeve, O, the sleeve or slide, O'", the post, P, and the reel, O'", in such a manner that while the post, P, supports the reel, the elevation of the latter is adjusted by the compound rod, n o", substantially as and for the purposes specified.

3d, The rod, H, having the crank, h, and the worm, h', in combination with the worm segment, I, the shaft, I, the winding arm or segment, I', and the chain, K, substantially as and for the purpose specified.

71,990.—MACHINE FOR STRETCHING CLOTH.—A. C. Corpe, Stafford, Conn.

I claim, 1st, The two gear clamps, B B, composed each of two wheels, a a', one placed above the other, and the upper wheels arranged so as to be capable of adjustment, both vertically and laterally, substantially as shown and described.

2d, The arrangement of gearing, as shown, in connection with the gear clamps, B B, and roller, C, whereby an equal movement of the clamps is insured, substantially as shown and described.

3d, The supplemental frame, E, provided with the roller, D, upon which the cloth is wound, in connection with the gearing, k u, clutch, o, driving pulley, m, and shaft, l, all arranged substantially as shown and described.

71,991.—ROLLER FOR DRESSING.—Benjamin R. Cotton, Lewiston, Me.

I claim as an improved dresser roll, a stone roll covered with the surfacing metal, or metal composition, substantially as set forth.

Also, the method of surfacing a roll by placing around or over a central roll a metal frame as a base upon which to cement the surface metal, and the surfacing such frame, substantially as set forth.

71,992.—WAGON LOCK.—James A. Counts, Indianapolis, Iowa.

I claim the catch, g, the bands, h h, the spring, the bar, e, lever, k, for the purposes set forth and described.

71,993.—HAME TUG.—Jas. C. Covert, Townsendville, N. Y.

I claim, 1st, The metallic hames tug, A, provided with the V-shaped openings, C, having inclined sides, and the tongues, D, adapted to receive the V-shaped block, O, formed upon the block, N, of the trace strap and block, O, held in place by means of the pin upon the spring lever stop, Q, fitting in the groove, P, in the end of tongue, D, of the hame tug, as herein described for the purpose specified.

2d, The hame clip, fastened by bolts to the hame tug, substantially as herein described and for the purpose specified.

3d, The block, N, upon the trace strap, when provided with the V-shaped block, C, and the spring lever, Q, as herein described for the purpose specified.

71,994.—HARVESTER RAKE.—James S. Crump, Williamsburg, Mo.

I claim, 1st, The curved eccentric arm, I, applied to the rock shaft, E, and operated in the manner and for the purpose described.

2d, The swinging lever, M, or its equivalent, in combination with the curved eccentric arm for operating the platform, as described.

3d, The arrangement of one or more springs in combination with the curved eccentric arm, I, for the purpose set forth.

4th, The manner of adjusting the hight of the swinging platform upon the supporting arms and uprights, as described.

5th, The adjustable cant or deflecting boards, C, in combination with the swinging platform, as described.

71,995.—WASHING MACHINE.—S. W. Curtiss, Sugar Grove, Pa.

I claim an improved washing machine, consisting box, A, provided with blocks, H, and roller, E, the hinged frame, B, having rollers, C D, and handle, G, all constructed, arranged and operating as and for the purpose set forth.

71,996.—MACHINE FOR FORMING HAT BODIES.—Francis Degen, Newark, N. J.

I claim, 1st, A hat body formed partly of common and partly of fine stock, by first blowing on the cone a belt of fine stock, then over the whole cone a quantity of common stock, and finally a quantity of fine stock, substantially as set forth.

2d, The close fitting cap, B, in combination with the perforated cone, A, of a machine for forming hat bodies, substantially as and for the purpose described.

3d, The slide, D, in combination with the trunk, C, cap, B, and perforated cone, A, substantially as and for the purpose set forth.

71,997.—MAIL-BAG FASTENER.—S. Denison, Portlandville, N. Y.

I claim the hooks, C, constructed substantially as herein shown and described, in combination with the straps, D and F, with the bag, B, and staples, A, as and for the purpose set forth.

71,998.—SAWBUCK.—Henry J. Dill, Cummington, Mass.

I claim the clamps, D, the treadle, E', the arms, E, springs, F', and rods, F, constructed, arranged, and operating, in combination with the stationary part, A, substantially as shown and described for the purpose set forth.

71,999.—CARRIAGE FOR ROCK DRILL.—Thomas Doane, Boston, Mass.

I claim the arrangement of the round bars, E F G and H, of a rock drill carriage into a frame, for the reception of rock drilling machines which shall be able to reach therefrom any point where it is desirable to bore a hole, substantially as and for the purpose described.

2d, The position of the horizontal round bars, E and F, under an acute (more or less) angle, d, to the side frame of a rock drill carriage, or to the alignment of the tunnel, substantially as and for the purpose set forth.

3d, The construction of a rock drill carriage for driving a tunnel or mine so as to swing in a vertical direction on the forward wheels and axle, substantially as and for the purpose specified.

72,000.—RAILWAY CHAIR.—John H. Downing, Salem, Mass.

I claim the single-headed chir, A, in combination with a sectional railroad rail, arranged as and for the purpose shown and described.

72,001.—ROTARY PUMP.—John Doyle, Hoboken, N. J., and Timothy A. Martin, New York city.

We claim the two drums, A C, placed concentrically one within the other, the chamber, D, air passages, E E', valves, F G, and tubular journals, B B', all arranged and combined to operate in connection with water or other liquid placed in the space or spaces between the two drums, A C, substantially in the manner as and for the purpose specified.

72,002.—GRINDING MILL.—James F. Drummond, New York city.

I claim the tubular inlet-journal, b, having its interior contracted around the feed pipe at one point, and thence flaring toward the cylinder and the blast pipe, substantially as and for the purpose specified.

72,003.—PIVOT GEARING.—Joseph J. Duchesne, Lacon, Ill.

I claim the circular bed plate, A, in combination with the pinion plate, B, and coupling plate, C, secured by the set screw, S, the whole arranged and operating substantially as and for the purposes set forth.

72,004.—CULTIVATOR.—William Duffner, Petersburg, Ind.

I claim the cultivator composed of the elements, A B B' C D E F H I J N, and the device for regulating the depth of the shovels, composed of the elements, G K L M P, constructed and arranged as set forth.

72,005.—WOVEN FABRIC.—J. Renshaw, East Greenwhich, R.I.

I claim the fabric, herein described, as a new article of manufacture.

72,006.—HORSE RAKE.—Edward A. Field, Sidney, Me.

I claim, 1st, The application of each tooth, E, to its arm, D, by means of a round tenon arranged at an obtuse angle with the axis of the tooth, and going into the arm, the same being substantially as and for the purpose described.

2d, Also, the combination as well as the arrangement of the adjustable brace, d, and the staple or clasping wire, f, with the arm and the tooth, when applied by means substantially as specified, viz., a cylindrical tenon arranged at an obtuse angle with the axis of the tooth, and going into a corresponding hole made in the arm.

3d, Also, the combination of the clamping screw, h, with the arm, and the tooth applied to such arm by a tenon arranged at an obtuse angle with the axis of the tooth as specified.

4th, Also, the arrangement of the rope, or its equivalent, with the several arms and their teeth, and the braces thereof, the said rope being to operate as and for the purpose specified.

72,007.—PUNCH FOR FORMING CLASP.—Charles D. Flesche, New York city.

I claim the sliding punch, B, in combination with the plates, A A', cutters, b b, and spring, e, substantially as and for the purpose herein shown and described.

72,008.—SELF-FASTENING SPRING FOR WEBBING.—John Flinn, Philadelphia, Pa., assignor to Archer Steel, same place.

I claim a spiral spring, for webbing, having the wire at one end of the spiral coils, A A, bent in the manner described and shown by B C D E, for the purpose specified.

72,009.—CARVING KNIFE AND FORK HOLDER.—Alden T. Foster, Albany, N. Y.

I claim, as an article of manufacture, the dish or stand, A, constructed substantially as described, with notches, a a and c c, as and for the purpose set forth.

72,010.—LAMP CHIMNEY.—Sam'l W. Fowler, Brooklyn, N.Y.

I claim the construction of the glass chimney, with its concave and convex deflectors, J and E, on each side, and collar, B, beneath, with its projections, C C, as herein described and for the purposes set forth.

72,011.—CARTRIDGE BOX.—William Freeborn, Tivoli, N. Y.

I claim the square box, A, made of leather or any suitable material, when constructed with a series of round, fluted, or ruffled holders, B, on the inside, made of any firm or flexible material, a series of holders, B, being attached to each flap, C, in front, and the flaps buttoning to the sides of the box, A, as herein described and for the purpose set forth.

72,012.—DEVICE FOR HITCHING HORSES.—Samuel Galbraith, New Orleans, La.

I claim the device above described, consisting of the rings, A and B, and the pivoted curved jaws, C C, meeting at one extremity at e' e', and connected at the other by means of the rods, r r, and springs, s, working in the tube, substantially as and for the purpose specified.

72,013.—CAPPING SCREWS.—J. Gardner, New Haven, Conn.

I claim, 1st, Cutting away or depressing the cap at the point where it meets the nick in the screw head, substantially as described, so that such cut away or depressed portion, while connected with and forming part of the cap shall lie within or line the nick in the screw head, as set forth.

2d, A capped screw in which the slot or depression in the cap corresponding to the nick in the screw head is formed, substantially in the manner and for the purposes herein shown and described.

72,014.—TIGHT AND LOOSE PULLEY.—Joseph P. Gates, Lincoln, Ill.

I claim the construction of the pulley, e, in two sections, with the arrangement and combination of the ram spring, F, the rebound guard, G, the stop flange, I, the case dog, J, and spring, K, the case-dog ram, L, the shuttle key, P, and stands, Z, and arm, b, with cam, a, when constructed, arranged, and operated as herein described, and for the purposes set forth.

72,015.—BRICK MACHINE.—Samuel Gissinger, Allegheny City, Pa.

I claim, 1st, The device for moving the mold on to the roller way, G, consisting of the arm, l, held by a spring, m', lever, m, pin, n, on the gear wheel o, and block, j, moving in the slot, h, substantially as described.

2d, The device for moving the molds under the hopper, consisting of the gear wheel, p, operated by the gear wheel, o, arm, k', and block, k, moving the slot, l, substantially as described.

3d, In combination with the above, the gear wheel, o, shaft, B, grinding knives, C, stationary knives, D, and fillers, F, in the hopper, A, substantially as and for the purposes described.

4th, The roller way, G, provided with openings and rollers, g and g, substantially as and for the purposes described.

72,016.—HARVESTER RAKE.—James H. Glass and Albert J Glass, McGregor, Iowa.

We claim, 1st, The combination of the wheel, L, with the rake wheel, A and arms, C, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the cam, O, and bent or crooked lever, M, with the shaft N, of the gear wheel, L, and with the arm, I, rigidly connected with the switch, F, substantially as herein shown and described and for the purpose set forth.

72,017.—METHOD OF MOLDING PLASTIC MATERIAL.—Wm. B. Gleason, Boston, Mass.

I claim the process substantially as and for the purposes specified.

72,018.—HAND CULTIVATOR.—Wm. C. Goodwin, Hampden, Conn.

I claim, 1st, The combination of the frame, C, with frame, G, and the set screws, x and y, and binding screw, f, when they are constructed, arranged, and fitted for adjusting the blades, substantially as herein described and set forth.

2d, The combination of the blade with the foot and shank, when the foot is made with a keel, like v, to guide the blade and strengthen the shank, substantially as herein described and set forth.

3d, The combination of the handle, D, with the frame, G, when the handle is made adjustable by means of the tongue, h, and set screw, j, and the whole is constructed, combined, and fitted for use substantially as herein described and set forth.

72,019.—APPARATUS FOR MAKING DIPPED CANDLES.—Peter R. Gottstein, Houghton, Mich.

I claim, 1st, The combination and arrangement, substantially as described, of the weighted cistern, B, car, A, and straps, C, for the purpose set forth.

2d, The combination of the cistern, B, car, A, and track, I, substantially as and for the purpose described.

3d, The combination and arrangement of the slab or board, J, with the weighted cistern, B, substantially as and for the purpose described.

4th, The new process of producing dipped candles by raising the molten tallow or other liquid to the wicks, substantially as described.

72,020.—CORN SHELLER.—Joseph Gould, Grinnell, Iowa.

I claim, 1st, The roller, C, having its teeth placed upon its face in the manner herein described, and placed within the box between the stationary board, b, and adjustable board, F, by means of its curved springs or oblong slot, when used in combination with metallic inclined plane, E, and hopper, B, with false bottom, as herein set forth.

72,021.—KNIFE CLEANER.—Lewis Goulding, Medfield, assignor to himself and James E. Carpenter, Foxborough, Mass.

I claim, 1st, The combination in an implement for scouring knives, of the bar, B, with its adjustable pad, g, arranged for operation as and for the purposes herein shown and described.

2d, Also in combination with the board or tablet, A, the bar, B, provided with the scouring pad, g, and pivoted to such board, and operating with its upper surface, or upon an inclined bed formed thereon, essentially as herein set forth and explained.

3d, Also the combination with the bar, B, and its pad, of the knife bed and the inclosure for holding and receiving the scouring material, arranged relatively to each other and to the bar, B, as herein shown and set forth.

72,022.—FENCE POST.—David M. Graham, Evansville, Ind.

I claim, 1st, The construction of double portable fence posts, attached by metallic bevel clasps, with flanges, slots, and tongues, and secured by keys, substantially in the manner and for the purposes as herein described and shown.

2d, The adjustable anchors or braces attached by metallic eyes and key, and the combination of the feet of the posts and base, substantially in the manner and for the purposes as herein described.

72,023.—STEAM GAGE.—Albert S. Greene (assignor to John F. Olmsted), Washington, D. C.

I claim, 1st, The construction of a steam gage with two columns of mercury, A and F, communicating with each other at their lower extremities by means of the flexible diaphragms, c and d, and the solid double-headed lifter C, substantially in the manner and for the purpose as herein set forth.

2d, The solid double-headed lifter, C, in combination with the flexible diaphragms, c and d, and the primary and secondary reservoirs, substantially in the manner and for the purpose as herein set forth.

3d, The transmission of the pressure of steam from one column to the other by means of a solid double headed lifter, in combination with the flexible diaphragms, c and d, substantially in the manner and for the purpose as herein set forth.

4th, Providing the primary reservoir, I, with the screw plunger, H, substantially in the manner and for the purpose as herein set forth.

72,024.—MACHINE FOR WALL BUILDING AND STUMP EXTRACTING.—Thomas S. Greenman, Mystic Bridge, assignor to George W. Packer, Jr., Mystic River, Conn.

I claim, 1st, The within described novel construction of a truss for a wall building machine, the same consisting in the pyramidal framing, A B B, the horizontal timbers, D D, uprights, E F, holding-down bolts G J, and inclined braces, I H, combined and arranged substantially as and for the purpose herein set forth.

2d, Also in such truss firmly securing the timbers, D D, to the pyramidal framing, A B B, by enlarging and bolting, or equivalent fastenings, at the points of contact, in addition to the truss work before described, substantially as and for the purpose herein specified.

3d, Also the diagonal arrangement of the holding-down bolts, G, at the front of my truss, the same being arranged relatively to the timbers, D, triangular frame, A B B, and their several connections, substantially in the manner and for the purpose herein set forth.

72,025.—WINDOW SCREEN.—A. W. Griffith, Roxbury, Mass.

I claim the roller cover, E, in combination with the removable screen, D, spring roller, C, sash, A, and window frame, as herein described for the purpose specified.

72,026.—FERTILIZER.—Wm. C. Grimes, Ladiesburg, Md.

I claim forming a fertilizer in the manner herein described, of the ingredients and proportions substantially as specified.

72,027.—CULTIVATOR.—John Gross and John C. Tunison, Decatur, Ill.

We claim, 1st, the arrangement and combined action of the two frames, so that when any permanent obstruction comes against any of the plows the frames will disconnect, and the back frame ride or move up on the front one and thus avoid breakage, substantially as described.

2d, Also a frictional spring hook upon the tongue or tongue frame, for catching or holding upon a cross bar of the rear frame so that the two frames will not disconnect until the pressure upon the plow or plows exceeds that for which the hook has been adjusted, substantially as described.

72,028.—HOSE SHIELD.—John A. Hasse, Philadelphia, Pa.

I claim the combination of the floor or footway, C, with the side pieces, b b, of a sectional hose bridge, constructed substantially as described.

72,029.—SKY ROCKET.—John W. Hadfield, Newtown, N. Y.

I claim the application of detachable wings to a sky rocket, through the medium of a collar or band, arranged so that the wings may be detached from the collar or band, or the latter detached from the rocket, substantially as shown and described.

72,030.—SKY ROCKET.—John W. Hadfield, East Williamsburg, N. Y.

I claim the attachment to a sky rocket of three or more sticks, at equal distances apart, substantially in the manner and for the purpose set forth.

72,031.—MACHINE FOR REFITTING CONICAL VALVE.—Chas. F. Hall, Brooklyn, N. Y.

I claim, 1st, A milling tool with one or more cutters attached to one or more arms or longitudinal sections of a cone, whether straight or oblique, whereby conical valves of different sizes may refitted, constructed substantially as shown and described.

2d, In combination therewith the yielding center, C, substantially as described.

72,032.—COLLECTING OXIDE OF ZINC.—Geo. C. Hall, Brooklyn, N. Y.

I claim, 1st, A building, structure, or compartment, A, provided with openings, a, covered by screens, B, substantially as and for the purpose set forth.

2d, A screen for separating the oxide of zinc from the fumes and gases of burning zinc ore, composed of ground cork, hair, wool, sponge, or other suitable or similar material, confined within a suitable chamber, substantially as set forth.

72,033.—REGISTER FOR ODOMETERS.—Henry F. Hart, New York city.

I claim the arrangement in an inclined position of the counting wheels, 1, 2, 3, 4, 5, and 6, upon shafts of equal lengths, in combination with the notched and perforated lid, B, as herein shown and described.

72,034.—NECKTIE.—Wm. H. Hart, Jr., Philadelphia, Pa.

I claim a bow or tie, A, having an elastic loop or cord, B, arranged horizontally at its rear, with both of its ends free, for the purpose substantially as described.

72,035.—ELLIPTIC CARRIAGE SPRING.—Horace R. Hawkins, Akron, Ohio.

I claim an elliptical carriage spring composed of a single piece, F, or two separate pieces, E E, of steel, united by means of blocks and bolts, substantially as herein shown and specified.

72,036.—HATCH-LINING DRAWINGS.—E. K. Haynes, Hanover, N. H.

I claim a straight-edge or scale having a mechanism for effecting an intermittent movement of the same, substantially as described.

Also in combination therewith, the tongue, q, for angular lining, substantially as described.

Also in combination with the feed mechanism, a mechanism for presenting the straight edge in positions radiating from a center, substantially as set forth.

72,037.—PLATFORM SCALE.—D. Hazzard, Milton, Del.

I claim the hollow stand, A, the spindle, C, the springs, D, the elastic rod, G, and the graduated plate, H, in combination and arranged substantially as shown and described for the purposes set forth.

72,038.—PIANO LOCK.—Adam Helmstaedter, Newark, N. J

I claim the pin, a, secured in the oscillating hook, C, and catching in a slot in the hook, C', substantially as and for the purpose described.

72,039.—TWEER.—John B. Himberg, Frederick City, Md.

I claim a tweer consisting of the box, A, annular cover, C, with a convex under side, and of the removable ring, E, from which the concave plate, F, is suspended, all made and operating substantially as herein shown and described.

72,040.—LAMP FOR BURNING PETROLEUM.—James Hinks and Joseph Hinks, Birmingham, England.

We claim, 1st, Constructing the burners of the said lamps substantially in the manner hereinbefore described and illustrated in Figs. 1, 2, 3, 4, 5, and 6, of the accompanying drawings, that is to say, the combination in the same burner of two or more flat or curved wick cases or holders, in which two or more flat wicks are placed, so as to produce thereby two or more flat flames or elliptical or nearly circular flames.

2d, Constructing and arranging the shade holders or galleries of the said lamps for the purpose of admitting air to the flames, substantially in the manner hereinbefore described, and illustrated in figs. 7, 11, 12, 13 and 14, of the accompanying drawings.

3d, Supporting the shade holders or galleries in a vase or cup on the top of the pillar of the lamp, and supplying air to the lamp through the said pillar or vase, or supporting them in a cup or vase without a pillar, the air in this case being supplied through the vase, substantially in the manner hereinbefore described, and illustrated in fig. 7 of the accompanying drawings.

4th, The improvement described and illustrated in figs. 11, 12, 13, and 14, of the accompanying drawings, for isolating the shade from the shade holder or gallery.

5th, The arrangement or combination of the parts of punkah-protectors or wind protectors, substantially in the manner hereinbefore described, and illustrated in figs. 7, 8, 9, 10, 11, 15, and 16, of the accompanying drawings.

72,041.—DEVICE FOR LASHING AND BINDING.—John M. Hirlinger, Red Rock, Pa.

I claim the cord, A, provided with the links, B and C, hooked lever, D, and slide, E, with its ring, a, arranged and used as and for the purpose set forth

72,042.—TOOL FOR OPENING FRUIT CANS.—Horace Holt, New York city.

I claim, 1st, A tool for opening sheet metal cans, composed of a hand lever, B, carrying a tooth, c, and connected to tongs, A, or other equivalent means, capable of clamping said tooth-carrying lever to the can, as set forth.

2d, Placing the tooth, c, in an oblique direction, when the same is used in combination with the hand lever, B, and clamping device A, substantially as and for the purpose described.

3d, The raised bearing, d, in combination with the lever, B, and clamping device, A, substantially as and for the purpose set forth.

72,043.—MOP WRINGER.—Zadok Howe, Lowell, Mich.

I claim the treadle, G, and spring bail, E, in combination with the rollers, B and C, the same being used as and for the purpose specified.

72,044.—MACHINE FOR MAKING EYELETS.—David K. Hoxsie, Providence, R. I.

I claim the combination of the eyelet forming punch, C, the eyelet forming die, e, and the punch, G, arranged and operating substantially as herein described, for the purpose set forth.

Also, in combination with the eyelet forming punch, J, and cutting punch, H, as described, the spring or snapper, g, arranged and operating substantially as described, for the purpose specified.

72,045.—RAILWAY SLEEPING CAR.—George W. Hunt, Hopkinton, Mass.

I claim the construction and arrangement of the backs of car seats, by which the whole of some of the backs, and parts of others, are formed into berths, in connection with adjacent seats, substantially as described.

Also, the combination of the leaves, n p, and q, hinged as shown, and to fold together, for a day car, or to be extended and made into a berth for a night car, substantially as described.

72,046. — HARVESTER. — George M. Jackson, North Hector, N. Y.

I claim the arrangement and combination of the toothed wheels, S and T, crank, U, box, W, of the hinged frame, V, adjustable finger bar, J, hoisting rope or chain, Y, and lever, Z, when constructed and operated as herein described and for the purposes set forth.

72,047. — REVERSIBLE SADIRON. — S. M. Johnson, Lockport, N. Y.

I claim, 1st, The combination, with a reversible sadiron, A, of the hollow handle, C, forming a reservoir, i, the pipe, D, leg, I, and set screw, H, or or equivalent, arranged and operating substantially in the manner and for the purpose set forth.

2d, Also, in combination therewith, the pipe, E, provided with burner, e, cone, G, and stop-cock, F, arranged and operating substantially as specified.

72,048.—BOOT AND SHOE.—William Keats, and John Keats, Street, England.

We claim the construction of coverings for the feet, substantially hereinbefore set forth, that is so say, with the sole cut at the edge, and sewed to the edge of the upper while turned outward, substantially as described.

72,049.—MUFF.—M. A. King, New York city.

I claim a muff provided with the skeleton spring frame B, made in sections, for the purpose of sustaining its cylindrical form, and adapting it for use as a reticule or pocket, substantially as shown and described.

72,050.—HORSE HAY FORK.—Alfred Knapp, North Fairfield, Ohio.

I claim the hinged chisel, c, in combination with the main piece, A, rod, B, brace piece, G, and holder, D, constructed substantially as described, and for the purposes set forth.

72,051.—FIFTH WHEEL FOR CARRIAGES.—Joshua Lawrence, Palmyra, N. Y.

I claim the combination of the housings, a a, inclosing the rollers, b b, with the bows, G H, the whole conducted and arranged as described, and operating in the manner and for the purpose set forth.

72,052.—WASHING MACHINE.—J. Q. Leffingwell, Nevada, Iowa.

I claim the combination of the semi-cylindrical box, D, segment, W, pinion P, parts, m m', lever, H, and ribs, r, as herein described, for the purpose specified.

72,053.—DOOR-FASTENER.—Francis C. Levalley, Warnerville, N. Y.

I claim the sliding wedge bolt, F, in combination with the sliding spring catch, K, and cases, E J, as herein described, for the purpose specified.

72,054.—CONDENSING ENGINE.—William A. Lighthall, New York city.

I claim the arrangement of the ordinary jet condenser, B, air pump, D, and hot well, E, with the surface condenser, F, and the valves, H K, and L, as shown and described, so that the change from the use of the jet condenser can be made at will, and *vice versa*.

72,055.—MACHINE FOR FORMING AND TEMPERING ELLIPTIC SPRINGS.—Geo. S. Long, Bridgeport, Ct.

I claim, 1st, A steel spring former, substantially as shown and described, and for the purposes set forth.

2d, The vibrating rod, B, and shoe, f', and any former, F, in combination with the slotted wheel, W, and roller, W', substantially as shown and described, and for the purpose set forth.

3d, The hollow shaft, s', and roller, W', in combination with the binder or presser, D, substantially as shown and described, and fo the purposes set forth.

4th, The sliding crank pin, p, in combination with the slotted wheel, W, and slotted vibrating rod, B, substantially as shown and described, and for the purposes set forth.

72,056.—FURNACE FOR HOT AIR BLAST.—Richard Long, Chillicothe, Ohio.

I claim, 1st, Constructing the air pipe of a furnace-blast heater of fire clay, substantially as described.

2d, Constructing the air pipe of an oval or other equivalent form, and uniting the sections of which it is composed by socket joints, with clumps and keys, substantially as shown and described.

3d, Forming the supporting walls, B, of fire brick, with iron plates between the courses, substantially as shown and described,

4th, Placing an open or a solid plate beneath the air pipe, substantially as and for the purposes herein described.

72 057.—CLOTHES RACK.—Eugene F. Lyman, Indianapolis, Ind.

I claim the combination and arrangement of the semi-circular racks, G and H, the arms, f and e, the sockets and staples for the arms, and the box, A B C D, all operating substantially as and for the purpose specified.

72,058.—CENTER BOARD FOR VESSELS.—E. J. McFarlin, San Francisco, Cal.

I claim the location of the center boards, or other equivalent devices for the same specific purpose, in the extreme bow and stern of vessels, that is to say, the placing of the said boards forward of the foremast or aft of the mainmast, in two masted vessels, and forward of the foremast and aft of the mizzen mast in three masted vessels, substantially as shown and described, and for the objects and purposes specified.

72,059.—REGISTER POINTS FOR PRINTING PRESS.—R. W. McGowan, New York city.

I claim, 1st, The pivoted or jointed pointer, B, having a spring or equivalent weight attached, and arranged to operate in the manner substantially as and for the purpose set forth.

2d, The tube, A, provided with the slotted cap plate, b, and the nut, C, when used in connection with the pointer, for the purpose specified.

72,060.—ROOFING.—Orville Manly, Garrettsville, Ohio.

I claim, 1st, a roof composed of tiles, a and b, having spaces, S, between them for a water tight cement, substantially as shown and described, and for the purposes set forth.

2d, The saturated tiles, a, and the saturated tiles, b, substantially as shown and described, and for the purposes set forth.

3d, The lower or outer row of tiles, b, when laid together, forming an eaves trough, substantially as shown and described, and for the purpose set forth.

72,061.—REFINING CAST IRON AND CONVERTING IT INTO STEEL.—Emile Martin and Pierre E. Martin, Paris, France.

We claim the method and means for refining and converting cast iron into cast steel and other metals, substantially as herein shown and described.

72,062.—STRAW CUTTER.—John W. Mauzy, Richmond, and James Hughes, Cambridge, Ind., assignor to James Hughes.

We claim, 1st, The combination of the side pieces, D D, constructed as described, containing the bearings for the cutting mechanism, the shearing bar, B, with square faces, and the spirally bladed knife, C, arranged substantially as described.

2d, The combination of the perforated rollers, E, ratchet wheels, F, pawls, H1, I and it, adjustable oscillating arm, G1, eccentric rod, L, and eccentric, M, respectively, constructed and arranged substantially as set forth.

3d, The arrangement of the cap, G, rollers, E E, covers, Q, sides pieces, D D, knife, C, and the driving and the feed mechanism, constructed and combined substantially as set forth.

4th, The feed rollers, E, when constructed from sheet metal, and punched from the inside, forming projections as shown, for feeding the straw to the knife.

5th, The metallic side pieces, D D, constructed as described, in combination with the bar, B, knife, C, feed rollers, E E, arranged substantially as set forth.

6th, The combination of the eccentric, M, on the knife shaft, eccentric rod, L, and oscillating arm, G1, when the latter are so arranged as to regulate the cut by adjusting the point of attachment, substantially in the manner set forth.

72,063.—CONVERTIBLE SHOT GUN AND RIFLE.—Samuel McCulloch, Yellow Springs, Ohio.

I claim, 1st, The removable barrel, C, constructed with external collars, c, and secured within a shot gun barrel, A, by a screw, D, substantially as and for the purposes set forth.

2d, Also the plug, F, for the purposes set forth.

72,064 —DERRICK.—D. J. McDonald, Gold Hill, Nevada.

I claim, 1st, The derrick standard, L, and frame, K, fitted in the derrick frame, J, and arranged as shown, for the ready adjustment of the standard, L.

2d, The fitting of the derrick frame, J, on the wagon frame, as shown, to wit, by means of the circular plate, D, frame, F, and circular plate, G, with the wheel, E, and pinion, Y, to admit of the ready turning of the derrick, as set forth.

3d, The supports, D, provided with screws, a, and attached to the frame, B, as shown, in connection with the levels, b, in platform, C, for the purpose of levelling the device, substantially as described.

4th, The annular platform, C, applied to the wagon, A, when used in combination with a revolving derrick frame, J, substantially as and for the purpose specified.

72,065.—AUGERS.—John A. McGee (assignor to Theodore Mace), New York city.

I claim the boring instrument formed with a cutting edge extending outwardly from the base of the tapering screw, and curved backwards and downwards until it intersects the periphery of the tool, as and for the purposes set forth.

72,066.—DRY DOCK.—Israel J. Merritt, New York city.

I claim, 1st, The arrangement and combination, with a floating section or dock, A, of one or more wells, through which a lifting chain or chains are passed down to the vessel or object to be raised, substantially as described.

2d, The arrangement and combination of the lever, J, with the floating dock or section, A, and chain or chains, C, substantially as described.

3d, The shape of the well, B, the same being made flaring from its top downwards, so as to allow the chains to go or be conducted from the mouth of the well directly towards the vessel or object to be raised, substantially as shown.

72,067.—KNIFE AND FORK CLEANER.—John Merritt, New York city.

I claim, 1st, The combination of the circular disks, D, leather or equivalent rubbers, K, shaft, A, holding plates, E E', adjusting nut, G, and adjusting screw, I, with each other and with the box, B, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the friction wheel, O, brush, N, and shaft, L, with each other, and with the disk, D, and box, B, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the lever, M, spring, P, and hook, R, with the brush shaft, L, and box, B, substantially as herein shown and described, and for the purpose set forth.

72,068.—MANUFACTURE OF LAMP BLACK.—A. Millochan, New York city, assignor to R. N. Perlee, Jersey City, N. J.

I claim the method herein specified of manufacturing lamp black by condensing the carbonaceous vapors upon a surface directly over the flame, that is constantly kept sufficiently cool by artificial means.

72,069.—CAR BRAKE.—James Mitchell, La Porte, Ind.

I claim, 1st, The combination of the lever, A, rod, B, lever, C, pawls, D and D1, spring, D2, and ratchet wheel, E, substantially as and for the purpose set forth.

2d, The combination of the shaft, E3, collar, R, arm, R', collar, S, and shaft, I, substantially as set forth.

3d, The combination of the shaft, I, spiral collar, U, lever, T, and arm, R, for disengaging the brakes, substantially as set forth.

4th, The combination of the ratchet bar, P, with the inclined face, P1, and catch lever, G, substantially as and for the purpose set forth.

5th, The combination of the ratchet bar, P, with its shoulder, P2, and the lever, T, substantially as and for the purpose set forth.

72,070.—AUTOMATIC TABLE FOR TEACHING.—Hannah Munson, Rockford, Ill., administratrix of the estate of Wm. C. Munson, deceased.

I claim the combination of the frame, A, with its pivoted pointers, C C, and hooks, c c, and movable bars, B B, with pointers and charts, D, as constructed, the whole being arranged and used substantially as and for the purpose specified.

72,071.—HYDRANT.—John G. Murdock, Cincinnati, Ohio.

I claim, 1st, The hollow plunger, E, having the interior valve, I, and sleeve packing, F, which respecively close and encircle the supply and waste pipe, B, as and for the purpose set forth.

2d, In combination with the supply and waste pipe, B, and valve, I, the vertically adjustable hollow plunger, E, for the object stated.

3d, The adjustable shoulder or lock nut, J, in combination and arrangement with the elements, B, D, I and E.

4th, The arrangement of internally packed plunger, E, which surrounds and packs a vertical supply pipe, B, having one or more waste ways, D, and being enclosed within and guided by a cup, C, substantially as described.

72,072.—CLEANER FOR LAMP CHIMNEYS.—R. B. Musson, Champaign, Ill.

I claim a cleaner for lamp chimneys, bottles, and other articles of a similar character, consisting of strips of rubber, or other soft elastic substance, secured to a holder, and arranged in manner and for the purposes substantially as above set forth and described.

72,073.—BOOT AND SHOE HEEL.—Erastus Newhall, Lynn, assignor to himself and John R. Moffitt, Chelsea, Mass.

I claim a heel made with a circular tread and a corresponding seat, when one or both of the two parts are made of elastic material, and are united substantially as described.

72,074.—PORTABLE HOT AIR CONDUCTOR.—John B. Oldershaw, Baltimore, Md.

I claim a portable hot air receiver and conductor, constructed, arranged and operating in connection with a stove, for the purpose of heating apartments above it, substantially as described.

72,075.—VINE HOLDER.—Garret J. Oiendorf and Albert O. Parshall, Middlefield, N. Y.

We claim, 1st, The frame, A, constructed as described and set forth, for the purpose specified.

2d, The cord, B, combined with and supported by frame, A, as described and set forth, for the purpose specified.

72,076.—BREECH-LOADING FIRE-ARMS.—Henry O. Peabody (assignor to the Providence Tool Company), Providence, R. I.

I claim combining the breech block, A, hinged at its posterior extremity, and operating as described, with the hammer, D, by means of the protuberant inclined plane, C, or its equivalent, substantially as described for the purposes specified.

72,077.—RAILWAY CROSSINGS.—Stanhope Perkins, Fairfield, England.

I claim forming the points or V-parts of crossings, without splice, by bending the rail, prepared as above described, back upon itself, and securing the abutting parts in the manner and for the purpose above set forth.

72,078.—MANUFACTURE OF LAMP BLACK.—R. N. Perlee, Jersey City, N. J.

I claim the method herein specified of manufacturing lamp black, by introducing atmospheric air to the flame, by artificial means, for the purposes set forth.

72,079.—AXLE BOX.—Henry B. Pitner, La Porte, Ind.

I claim, 1st, An axle box, substantially as shown and described, and for the purpose set forth.

2d, The sleeve or thimble, A, in combination with the end pieces, B, substantially as shown and described, and for the purposes set forth.

3d, The shoulder, a1, and the shoulder, a2, in combination with the sleeve, A, and end pieces, B, substantially as shown and described, and for the purposes set forth.

72,080.—RAILWAY CHAIR.—Leander Pollock, (assignor to himself and John P. Schenck, Jr.), Matteawan, N. Y.

I claim 1st, A railroad-chair which is divided by an inclined line drawn through the base, into two parts, A and B, each part carrying one of the cheeks, and all made and operating substantially as herein shown and described.

2d, Interposing an elastic plate, g, between the edge of the upper base, d, and the stationary cheek, a, substantially as and for the purpose herein shown and described.

72,081.— VENTILATING HAY-MOWS.— Geo. Race, Norwich, N. Y.

I claim making vertical perforated pipes, having lateral branches extending out from the main pipe for the purpose of ventilating hay-mows, and stacks of hay or grain, substantially as herein set forth.

72,082.—PNEUMATIC CAR.—Louis Ransom, Lansingburg, N. Y.

I claim in combination with a pneumatic car, a series of metal cylinders, for containing compressed air, the said cylinders being connected by pipes, so as to form one common reservoir substantially as described.

2d, I also claim the combination, with a stove for warming the car, or other heating apparatus, a conducting pipe, for the compressed air, so located with reference to the stove or other heating apparatus that the compressed air in passing through it will become heated, and have its expansive power increased thereby, substantially as described.

3d, I also claim the compound flexible pipe, constructed substantially as described.

4th, I also claim the muffler, D, for the purpose of deadening the sound of the escaping air as described.

72,083.—MACHINE FOR SHARPENING SAWS.—E. B. Rich, (assignor to himself and Andre Cushing), Boston, Mass.

I claim the sliding holder, B, and adjustable rail, C, in combination with the grinding wheel, D, constructed and arranged to operate as herein described, for the purpose specified.

72,084.—AUTOMATIC REGISTER.—J. T. Buckley, Ottawa, Ill. administrator of the estate of Stephen Rigler, deceased.

I claim 1st, Operating a register slide so as to regulate the temperature of apartments, by means of a column of mercury within a tube, which is arranged within the register itself and acts upon said slide through the means substantially as described.

2d, The combination of an index hand, S, with a register arranged and operated by a column of mercury within a tube, which is arranged within the register itself, substantially as described.

3d, The combination with a circular turning register slide, B, of mercury pipe, G' piston rod, g1, cross-head, g, toothed lever, F, spur wheel, d and shaft, b, arranged, constructed and operating substantially as described.

72,085.—SHOVEL PLOW, CULTIVATOR, ETC.—P. A. Ross, Harveys, Pa.

I claim 1st, The combination of the notched rack, E, and removable pin, F, with the pivoted or rocking cross-bar, C, and slotted standard, D, substantially as herein shown and described and for the purpose set forth.

2d, Connecting the forward ends of the handles, D, to the beam, A, by means of the hook or eye-bolts, G, and pivoted bar or plate, H, when used in connection with the pivoted or rocking cross-bar, C, and pin, F, substantially as herein shown and described and for the purpose set forth.

72,086.—FENCE POST.—Robert Ramsey, New Wilmington, Pa.

I claim the fence-post, P P' P'', having dove-tail gains at its lower end, in combination with the parallel slits, A A', and the keys, e e e e, substantially in the manner and for the purpose set forth.

72,087.—CHURN.—J. A. Rowley, Vanceburg, Ky.

I claim the arrangement substantially as described of the driving wheel, C, shafts, c c', spring, D, notched bracket, E e, and friction pulley, F G, for the purpose of imparting a rotary motion to the dasher shaft, f, in the manner herein described and set forth.

72,088.—STEAM TRAP.—David Saunders, Brooklyn, N. Y. assignor to Jos. Nason & Co., New York city

Relaim 1st, The arrangement of the central part, C, of the cover and main cover, B, substantially as herein set forth.

2d, The arrangement of the stop-joint between the floating part and the fixed part of the apparatus, whereby to avoid the clogging by accumulations of dirt as specified.

3d, The arrangement of the tubes, E and H, the tube, H, being mounted upon the floating part, substantially as herein specified.

72,089.—DOOR SPRING.—Rudolph Schrader, Indianapolis, Ind.

I claim 1st, The door-spring, constructed as described, consisting of the hollow socket, F, placed over the square shank of the door arm: and provided with the right angular arm, J, sleeve, E, to which the inner end of the coiled spring, D, is securely fastened, fitting at or alternating upon the socket, F, and provided with the right angular arm, I, resting against the post, H, in the case, A, the free end, G, of the spring resting against the opposite side of said post, all operating as described for the purpose specified.

2d, The spring, D, operated by means of the right angular arm, J, of the hollow shank, F, engaging with the outer end, G, of the spring, when the door moves in one direction, and when moving in the opposite direction engaging with the arm, I, of the sleeve, E, to which the inner end of the spring is secured substantially as described for the purpose specified.

3d, The combination and arrangement within the case, A, of the spring, D, hollow socket, F, having arm, J, sleeve, E, having arm, I, post, H, and hook, G, operating as described for the purpose specified.

72,090.—POLE COUPLING FOR VEHICLES.—Anson Searls, N. Y. city.

I claim the circular joints, B B, and the arrangement of the ratchet teeth, K K, springs, D D, and bolts, E E, in combination with the arm, A, substantially as described and for the purposes set forth.

72,091.—CARRIAGE.—Anson Searls, San Francisco, Cal.

I claim, 1st, The axle composed of the steel bars, d and g, attached, as herein described.

2d, The clip b, passing around under the axle, with its ends fastened to the plate, a, on the rocker, both before and behind the axle, substantially as described.

72,092.—STEAM ENGINE.—George Shale, Taunton, Mass.

I claim, 1st, The steam-chest, B, constructed with the chambers, g h, and partition, p, in combination with the steam and exhaust pipes, and cylinder, a, substantially as described.

2d, The valve-rods, l l', provided with the recesses or chambers, k k', in combination with the partition, p, constructed as described, and operated by the lever, I, as and for the purpose set forth.

72,093.—FERRULE.—Archibald Shaw, Philadelphia, Pa.

I claim a ferrule, provided internally, or at its inner side, with oblique spurs or projections, substantially as and for the purpose specified.

72,094.—FENCE POST.—Warren H. Shay, Sylvania, Ohio.

I claim the plank standards, B B, joined by the pins, a a, the braces, A A, and the cross-piece, C, combined and secured by the dove-tail tenons, b b, the gib and key, c d, and the keys, g g, substantially as and for the purpose herein shown and described.

72,095.—TUBULAR HEATER.—C. J. Shepard, Brooklyn, N. Y.

I claim, 1st, The combination of the grate, E, ash-pit, D, and combustion-chamber, C, with the slide-valve, I, for the purposes indicated.

2d, The slide-valve at the junction of the upper and under front flue, for the purposes described.

3d, The upper front flue covered externally with a non-conducting lining, as a portion of the combustion-chamber.

4th, The corrugated tubular externally-flanged chamber, provided with an incombustible termination, constructed and operating substantially as shown, for the purposes pointed out.

5th, A semi-cylindrical reverberating chamber of combustion, when combined with a flue and a series of tubes, for the purposes specified.

6th, A feeding-chamber in combination with an arched chamber of combustion and the abutments for properly distributing the fuel upon the grate.

7th, Constructing the bed-plate or grate-plate in such a manner that the same shall form a support for the grate and brick-work of the chamber of combustion, as well as the bed of the front flue.

8th, The division-plate, in combination with a series of tubes, for the purposes fully described.

72,096.—WINDOW-SASH SUPPORTER.—J. W. Simpson, Newark, N. J.

I claim the lever, d, and wedge, b, constructed, combined, and operated substantially in the manner and for the purpose hereinabove set forth.

Also, the socket, m, with its ratch, n, and the catch, l, on the lever, d, in combination with the lever and wedge, in the manner and for the purpose specified.

72,097.—STAKE-HOLDER FOR RAILROAD CARS.—Thomas A. Slack, Peoria county, Ill.

I claim the combination of revolving staple, stakes, and divisional "coal sides," as described and for the purpose set forth.

72,098.—EXCAVATOR.—Benjamin Slusser, Sidney, Ohio, assignor to himself and Elias M. Gluck, same place.

I claim, 1st, The method of elevating or adjusting the plough of an excavator by the rotary motion of the forward axle, derived from the forward wheels by means of the clutches, a' a', substantially as and for the purposes set forth.

2d, In combination with the above, the plough, P, racks, r r, and pinion, s, when the latter is fixed to the axle, and operates to raise the plough by power derived from the axle, substantially as and for the purpose specified.

3d, The combination of the rocking cart, C, gear, e e' e'', apron, B, and plough, P, when the parts are so constructed and arranged that by the raising or depressing of the plough, the wheels, e e', shall be thrown into or out of gear, and the apron put in motion or stopped, substantially as and for the purpose specified.

4th, The combination of the looped rods, w w w, with the arms, v v v, doors, m m' m'', and lever, l'', substantially as and for the purpose specified.

5th, The lips or projections, o o, of the doors, m m' m'', substantially as and for the purposes set forth.

6th, The combination of the rod, u, lever, l', spring, s, trigger, n, doors, m m' m'', having the lips, o o o, rod, y', and hook, y, substantially as and for the purposes specified.

72,099.—AUGER HANDLE.—Daniel Y. Smith, Joliet, Ill.

I claim the combination of the ferrule, a, with the annular nut, e, and flat spring, c, when constructed and arranged as and for the purposes set forth.

72,100.—MACHINE FOR SHARPENING SAWS.—J. B. Smith, Milwaukee, Wis.

I claim cutter, B, gauge, E, and adjustable cone-mandrel, D, in combination, substantially as and for the purpose described.

72,101.—RAISING OILS AND BURNING-FLUIDS BY PNEUMATIC PRESSURE.—John Henry Smith, Allegheny city, Pa.

I claim raising, by pneumatic pressure, oils or burning-fluids from an oil or fluid compartment of a ship or other vessel, and mixing with said oil and fluid the gas generated therefrom, as herein described and set forth.

Also, the combination and arrangement of the pipes, A B C f and f', when used in connection with an oil or fluid compartment, R, of a ship or other vessel, the whole being constructed, arranged, and operating substantially in the manner herein described and for the purpose set forth.

Also, in connection with the above, ejecting fine jets of water into the flame, caused by the burning of the oil or fluid and other matter mixed therewith, as herein described and set forth.

72,102.—SHIP FOR TRANSPORTING PETROLEUM.—John H. Smith, Allegheny city, Pa.

I claim, providing the hulls of ships and other vessels with a compartment for oils and burning fluids, said compartment being protected with water, and furnished with supply and discharge pipes, substantially as herein described and for the purpose set forth.

72,103.—DEVICE FOR SHEARING AND CLIPPING WOOL.—R. T. Smith and J. K. Priest, Nashua, N. H.

I claim, 1st, The revolving spring cutter or cutters, O, in connection with a cutter-plate.

2d, The open cutter-plate, P.

3d, The shield, N, in connection with the cylinder, C, covering shaft, M, and extending into groove, g, substantially in the manner and for the purpose herein described.

72,104 —CORN PLOUGH.—John Snyder, Williamsfield, Ohio.

I claim the combination of the tongue, H, strap, L, and upright, K, with the forward end of the central beam, A, substantially as herein shown and described, and for the purpose set forth.

72,105.—BOOT-HEEL POLISHER.—V. K. Spear, Lynn, Mass.

I claim, 1st, The reciprocating polisher, moving in the line of an arc of a circle, by means of mechanism substantially as herein described, and having an elastic bearing, as and for the purpose set forth.

2d, In combination with a reciprocating polisher, substantially as described, I claim the pivoted sliding frame to support the boot or shoe, constructed, arranged, and operating substantially as set forth.

72,106.—MEANS FOR PROPELLING VESSELS.—Robt. R. Spedden and Daniel F. Stafford, Astoria, Oregon.

We claim, 1st, The combination of the rack-frame, K, racks, I and J, and ratchet-wheel, H, with each other and with a shaft, B, for the purpose of applying power to said shaft, substantially as herein shown and described.

2d, The combination of the stationary post, O, pitman, N, rocking-post, M, and adjusting slide, L, with each other, with the rack frame, K, and with the hinged parts of a vessel or other structure, one or both of said hinged parts floating in the water, so as to be acted upon by the motion of the waves, substantially as herein shown and described.

72,107.—CULTIVATOR.—C. E. Steller, Chicago, Ill.

I claim, 1st, The hinged runners, J W, substantially as and for the purpose set forth.

2d, The slotted sides, A A and B B, in combination with the shanks, C D E, arranged to be set at different angles, and fastened by set-screws, Z Z, as described.

3d, The combination of the guide-bar, E, arranged to be raised and lowered, with rear standards, H H, and sides, A A B B, as described.

4th, The combination of standards, G G, hinged runners, J W, and sides, A A B B, as set forth.

5th, The shanks, C, of shovel, T, arranged to fit in a socket, V, and bar, S, in combination with standards, G G, and cross-bar, I, as and for the purpose set forth.

6th, The double evener, L, arranged substantially as set forth.

7th, The double evener, L, in combination with braces, O O and P P, with or without braces, Y, substantially as set forth.

72,108.—EYE CUP.—Benj. F. Stephens, Brooklyn, N. Y.

I claim a pair of bowls, united by tubes or necks to an exhaustion-bag or ball, as and for the purposes set forth.

72,109.—HARVESTER RAKE.—Edward Stewart, Fort Madison, Iowa.

I claim the arrangement of the shafts, D E and G, with their respective wheels, crank, I, and pitman, J, with its dividing end, J', connecting the arms, c c, upon the box, K', at the end of shaft, K, the whole constructed and operating substantially as and for the purposes specified.

72,110.—STREET PAVEMENT.—H. M. Stow, San Francisco, Cal.

I claim, 1st, A wooden pavement, composed of alternate tiers of square-ended and wedge-shaped blocks, the wedge-shaped ends of the latter being driven down into a foundation-bed of sand or earth, substantially as and for the purpose described.

2d, A wooden pavement, composed of blocks with lower ends wedge-formed, and all driven down into a foundation-bed of sand or earth, substantially as shown and described.

73,111.—STREET PAVEMENT.—H. M. Stow, San Francisco, Cal

I claim, 1st, The cast iron plates, with projecting wedge-shaped flanges, to be driven into the sand or earth, substantially as and for the purpose set forth.
2d, Also a pavement composed of alternate tiers of cast iron plates, with projecting wedge-shaped flanges and wedge-shaped wooden blocks, driven into the sand and earth, substantially as described.

72,112.—WASHING MACHINE.—John D. Swartz, Milton, Pa.
I claim, 1st, The slotted arms, g, bearing the shaft, D, and rubber, C, when such arms are connected at their lower ends by the slotted bar, E, through which the spring, G, passes, as herein described for the purpose specified.
2d, The combination of the semi-circular rubber, C, slotted arms, g, shaft, D, slotted cross-bar, E, spirally grooved rollers, d, in the curved frames, B, the spring, G, and rack, H, as herein described for the purpose specified.

72,113.—PORTABLE FENCE.—G. D. Sweigert, Martic township, Pa., assignor to himself, John Sweigert and Felix W. Sweigert.
I claim a portable fence, combined of round wrought-iron posts, C, bed-plate, A, rails, B, scarfed, and applied with intervening ferrules, D, head and bottom washers, F, all arranged in the manner and for the purpose specified.

72,114.—VARIABLE CRANK FOR BORING-MACHINE.—G. C. Taft, Worcester, Mass., assignor to Theodore Mase, Sing Sing, N. Y.
I claim the two variable cranks, constructed as specified, and applied in the manner shown, to the shaft or axis of the boring-machine, as and for the purposes set forth.

72,115.—ROTARY TAKE-UP FOR KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, The stationary scroll-plate, C, placed over the center of motion of take-up of knitting machines, for the purpose described.
2d, Also, in combination with the scroll-plate, C, the toothed gear, D, for the purpose herein set forth.
3d, Also, the toothed wheel, D, or its equivalent, either separately, or combined with the described appendages, e i g i K, arranged as shown and described as operating substantially in the manner and for the purpose specified.
4th, Also, in combination with the above, the adjustable gear, s, and concentric gears, s', for the purpose described.

72,116.—KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, Forming the "jacks" or loop-lifters, B, with a projecting arc, f, and depressed arc, g, for the purposes set forth.
2d, In combination with the arc, f, and arch, g, the rounded end, as shown and described.
3d, In combination with the described knitting jacks, a retaining hub or device, constructed and arranged as shown and described.

72,117.—KNITTING MACHINE.—James Teachout, Waterford, N. Y.
I claim, 1st, The vertically adjustable collars or rings, G and H, for the purposes described.
2d, In combination with the collars, G and H, the partitions or wings, k, and groove, l, as set forth.
3d, In combination with the adjustable collars, G and H, wings, k, and groove, l, the "jacks" or lifters, M, formed as shown and described, for the purpose specified.

72,118.—MANUFACTURING ILLUMINATING GAS.—J. B. Terry, Hartford, Conn.
I claim, 1st, The method herein described of heating air charged with hydrocarbon vapor, so as to render it non condensable previous to its delivery as an illuminating gas, for the purposes set forth.
2d, The employment of a retort or other heating medium interposed between the carbureter and gas holder or other gas-delivering or gas-burning device, substantially as and for the purposes set forth.
3d, The employment of one or more burners under the retort or vessel, for the purpose of heating the same under the arrangement herein shown and described.
4th, The combination, with the carbureting-vessel and intermediate heater, of a jacket under or around the said carbureter, and a flue connecting the jacket with said heater, substantially in the manner and for the purposes set forth.

72,119.—LOOMS.—S. T. Thomas and J. H. Dolley, Guildford, N. H.
We claim, in combination with the lever, g, arranged to operate as set forth, the incline, p, or its equivalent, for relieving the picker from the action of the spring, i, to permit free movement of the shuttle-boxes, substantially as set forth.

72,120.—GATE.—John W. Thompson, Greenfield, Mass.
I claim a gate, made of metallic tubing and connections, substantially as herein set forth and described.

72,121.—TAIL-PIECE FOR VIOLINS.—James Thoms, South Boston, Mass.
I claim applying a winch to the tail-piece of a violin, substantially as and for the purpose herein shown and described.

72,122.—FOLDING BEDSTEAD AND CRIB.—R. S. Titcomb, Gloversville, N. Y.
I claim, 1st, A folding bedstead or crib, substantially as shown and described, and for the purpose set forth.
2d, A rotating bedding-box, A, in combination with the head and foot-boards of a bedstead or crib, substantially as shown and described, and for the purposes set forth.
3d, Folding head and foot-boards, composed of the parts, F and C, substantially as shown and described, and for the purposes set forth.
4th, The swinging sides, A', in combination with the box, A, and the head and foot-boards, F C, substantially as shown and described, and for the purposes set forth.

72,123.—STEAM ENGINE.—J. F. Troxel, Bloomsville, Ohio.
I claim, 1st, The construction of the oscillating valve, T, and arrangement of the openings, S P P', and R, substantially as shown and described.
2d, Also, the arrangement of the piston rods, K and L, operating in one and the same end of the cylinder, substantially as shown and described.

72,124.—WARDROBE.—Nathan Turner, West Lynn, Mass.
I claim a convertible wardrobe, closet, or book case, with swinging or folding sides, C, and swinging or folding top, A, and bottom, B, substantially as described and for the purpose set forth.

72,125.—APPARATUS FOR DISTILLING OILS.—Herbert W. C. Tweddle, Pittsburg, Pa
I claim, 1st, A trough or troughs, having perforations for the passage of the oil in small quantities, and furnished with points near to such perforations, so as to cause the oil to pass therefrom in drops, or fine streams, or thin films or layers, over heated pipes or tubes placed thereunder, when used within a vacuum still, for the purposes substantially as described.
2d, In a vacuum still for distilling oil, the use of a series or coil of steam pipe, placed horizontally, one under another, as a series of evaporating surfaces, substantially as and for the purposes above set forth.
3d, In a vacuum still for distilling oil, a series or coil of steam jet pipes, e, in combination with a series or coil of evaporating pipes, a, substantially as and for the purposes above set forth.
4th, Combining together a series of apparatus, such as hereinbefore described, for the purpose of procuring a continuous distillation of petroleum, each member of a series consisting of a vacuum still containing a coil of steam pipe as evaporating surfaces, and troughs for the gradual distillation of the oil, in combination with suitable condensing apparatus, substantially as and for the purposes hereinbefore set forth.
5th, A vacuum residuum receiver, D, connected to and in combination with a vacuum still, or a battery of such stills, substantially in the manner and for the purposes above set forth.

72,126.—DISTILLING HYDROCARBON OILS.—Herbert W. C. Tweddle, Pittsburg, Pa.
I claim, 1st, In distilling hydrocarbon oils, vaporizing the oil by causing it to flow in a thin film or layer over the surfaces of a series of heated pipes in a vacuum still, with or without the application of superheated steam, substantially as above described.
2d, The application of the process of distillation, hereinbefore described, to the re-distillation of fire-distilled oils, for the purpose of producing an oil similar to the refined oil of commerce, substantially as above set forth.
3d, Securing a continuous and complete distillation of hydrocarbon oils, by causing the oil to flow over the surfaces of a succession of heated pipes in different vacuum stills, the temperature of such pipes increasing in each successive still, so as to drive off at first more volatile ingredients, and then those less so, and so on till only the residuum remains, substantially as hereinbefore described.

72,127.—GRAIN DRILL.—Joseph G. Vale, Cumberland Co., Pa.
I claim the quarti-elliptical shovel, B, with its base, E E', coming to a point at E, the rod, C, the rod, H, with thereon the balls, D and D', together with the funnel, A, all constructed and operating in the manner and for the purpose described.

72,128.—WINDOW-SASH STOP.—George R. Vanderbilt (assignor to himself, J. J. Lindstrom, and D. W. Stidolph), Mount Vernon, N. Y.
I claim, 1st, The two clamping plates, and the tightening bolt, combined and operated substantially as and for the purpose specified.
2d, The springs, arranged in relation to the plates, c d, substantially as and for the purpose specified.

72,129.—MUSICAL INSTRUMENTS.—George W. Van Dusen, Williamsburg, N. Y.
I claim the combination and arrangement of lever, V, with finger-piece, Y, at one end, and stud, b, at the other, valve, G, and air passage, E, closed by a flexible diaphragm, K, substantially as herein described, and for the purpose of producing, by means of air, an action upon any suitable sound-producing mechanism through the movement of a sheet or strip perforated, or in any other equivalent manner prepared.

72,130.—WATER INDICATOR FOR BOILERS.—Andreas Vang, Chicago, Ill.
I claim the arrangement of the globe, a, arm, b, cylinder, c, indicator, f, and whistle, g, substantially as herein set forth.

72,131.—HORSE HAY FORK.—Oliver Vanorman, Ripon, Wis.
I claim the arrangement of the fork heads, B B', in the frame, A, and with the arms, C C', rollers, e e, and cords, D D, as and for the purpose set forth.

72,132.—WASHING MACHINE.—Lewis Vaughan, Rapids, O.
I claim the adjustable bottom, B, and spring lever, I, as arranged in combination with the roller, C, in the manner substantially as described.

72,133.—HAY RAKER AND LOADER.—Albert Vose, Pittsfield, assignor to himself and Ambrose S. Vose, Randolph, Vt.
I claim, 1st, The fork arm, b, hinged or pivoted to the frame in line with the axle, and operated by means of friction blocks, as described.
2d, The friction blocks, d, in combination with fork arm, b, and eccentric levers, e, arranged as described.
3d, The fork arms, b, in combination with the freely-swiveling fork bar, o, operated as described.
4th, The forks, q, pivoted in swiveling bar, o, and operated by means of levers, v, and rods, cords, or chains, substantially as described.
5th, The levers, v, mounted on fork bars or arms, b, in combination with the fork, q, substantially as described.
6th, The combination of forks, q, spring, t, chains, w, and levers, v, with the fork arm, b, substantially as and for the purpose set forth.
7th, The means for opening and closing the lifting forks, in combination with a means for operating the friction blocks, or their equivalent, whereby they are operated simultaneously, as described.
8th, The lever, e, for closing the forks and applying the friction blocks, as described, in combition with the arms, g, for releasing the same as described.
9th, The extension, x, of the pivoted fork bars, b, in combination with cords or chains, 5, operating as described
10th, The curved or semicircular rake head, or its equivalent, arranged in rear of and operated in connection with the lifting fork, substantially as described.

72,134.—WASHING MACHINE.—George E. Wade, Jefferson City, Mo.
I claim the lever, M, the spiral metal plate, F, the wash boards, A and B, corrugated as shown, and the springs, c c' c'', in combination with a common wash tub, when constructed, arranged, and operating substantially as shown and specified.

72,135.—BOLT AND RIVET MACHINE.—John Wakefield, Birmingham, England, assignor to Isaac Smith and William Fothergill Barbo.
I claim, 1st, the arrangement or combination, substantially as hereinbefore described, and illustrated in the accompanying drawings, of the vertical dies, b b, for cutting off and carrying the cut-off length of rod, and for shaping the head of the rivet or bolt, with the horizontal punch or die, m, for shaping the shank of the rivet or bolt, and upsetting the end of the rivet or bolt into a head in the vertical dies.
2d, The arrangement or combination of parts hereinbefore described, and illustrated in the accompanying drawings, for giving motion to the said vertical dies, b b, and horizontal punch or die, m.
3d, The arrangement or combination of parts hereinbefore described and illustrated in the accompanying drawings, for removing the finished rivet or bolt from the horizontal punch or die.

72,136.—EGG BEATER.—Dudley Webster, Washington, D. C.
I claim as a new article of manufacture an egg-beater spoon, constructed as described, viz., with its circumference and the edges of an inner central opening serrated as and for the purpose described.

72,137.—BRICK MACHINE.—P. V. Westfall, Kalamazoo, Mich.
I claim, 1st, the combination of the two molding cylinders, C C, when the molding recesses, I I, in said cylinders, and their intermediate followers, J J, are so proportioned with each other that the faces of the said followers cannot be brought in contact with each other, and when the said follower pieces have substantially the degree of curvature herein represented and described.
2d, In connection with the molding cylinders, C C, I also claim the central shaft, b, and its operating levers, L L, in combination with the jointed rods, n n, and the crank arms, m m, on the respective cam shafts, for operating all the cams simultaneously, substantially in the manner herein set forth.
3d, Also the vibrating spring scraper, i, in combination with the wire cloth belt, w, when arranged with the molding cylinders, C C, and operated substantially in the manner and for the purpose herein set forth.

72,138.—APPARATUS FOR ENAMELING PHOTOGRAPHIC PICTURES.—Nathaniel Weston, San Francisco, Cal.
I claim the rest, A, for the glass, or its equivalent, the use of the glasses, B B, the weight G, the fastenings, H, the clamps, E E, or their equivalents, in combination, for the purposes herein set forth.

72,139.—VALVE GEAR FOR STEAM ENGINES.—Norman W. Wheeler, Brooklyn, N. Y.
I claim, 1st, Opening the ports, as l' l'' so as to suspend the operation of the moving force upon the valve or valves at the period when the steam is cut off, and before the exhaust is opened, substantially as and for the purpose herein set forth.
2d, Also the closure of certain ports, as l' l'' and k' k'', so as to cause the valve or valves to resume the movement toward its or their full throw at the proper period, substantially as and for the purposes herein set forth.
3d, Also opening the proper ports, as h' h'', so as to suspend the moving force operating upon the valve or valves, when they or it have reached the proper limit of throw, substantially as and for the purposes herein set forth.
4th, Also regulating the times of closing passages, so as to induce the cutting-off movement of the valve or valves, at variable periods, substantially in the manner and for the purposes herein set forth.
5th, Also changing a continuous reciprocating motion derived from an eccentric, or equivalent moving part of the engine, to an intermittent reciprocating motion, by means of a hydraulic apparatus, as hereinbefore described, substantially in the manner and for the purpose herein set forth.

72,140.—DITCHING MACHINE.—A. H. Whitacre and T. S. Whitacre, Morrow, Ohio.
We claim, 1st, The combination of the sled, A, and the frame, B, connected by the racks and pinions, c a, at the corners, arranged and operating substantially as and for the purpose described.
2d, The pulleys, D and E, carrying the endles chain, g, with the scoops, h h, in combination with the drum, C, the plungers, n n, operating by the double incline, p, around the wheel, K, and the sweep, F, constructed and operating substantially as and for the purpose herein described.

72,141.—FARM FENCE.—Samuel P. Williams, Sheridan, N. Y.
I claim the application and use of the triangular brace posts, B B, and tie-rod, C, in the construction of farm fences, in the manner substantially as described.

72,142.—VENTILATING TUNNEL.—Hugh B. Wilson, N. Y. city.
I claim, 1st, The method of applying street lamp posts, and awning and other useful or ornamental posts, pillars, or structures, to the purposes of ventilating underground railway tunnels, substantially as within described.
2d, Also the combination of street lamp posts, and awning and other posts, pillars, or structures, whether for ornament or use, with the connecting tubes of such railway tunnels, substantially in manner set forth.

72,143.—MEDICAL COMPOUND.—J. T. Wilson, Brooklyn, N. Y.
I claim the combination of the above-named ingredients in the manner as and for the purpose described.

72,144.—SHOE LIFTER.—Wm. H. Winans, Newark, N. J.
I claim, 1st, The combination of the lever plate, A, griping plate, B, spring, b, and holding lever, C, substantially as and for the purpose specified.
2d, The teeth or studs, a', provided upon the inner surface of the griping plate B, and arranged in relation with the back of the plate, A, substantially as and for the purpose specified.

72,145.—STOVE.—T. W. Wisner, Howell, Mich.
I claim the portable bop-drying stove, constructed as described, of the corrugated side and end plates, A, supported upon the ash pan, B, extending the entire length of the stove, and mounted upon wheels, the adjustable grate placed at b, in the center of the stove, and the boiler, all arranged as described for the purpose specified.

72,146.—PAPER FILE.—John Wolfe, Washington, D. C.
I claim the paper file or holder constructed and operated as herein recited.

72,147.—LATHE BOX AND JOURNAL.—Aurin Wood, Worcester, Mass.
I claim, 1st, The combination and relative arrangement of the oil box, B, and grove, a, and inclined oil passage, e, formed in the bottom part, A, of the journal box, substantially in the manner and for the purposes herein shown and specified.
The combination of the journal, C, having the peculiarly shaped grooves, d d, cut in its surface, with the journal box, D, provided in its lower part with the oil box, inclined oil passage, and groove, a, under the arrangement substantially as herein shown and set forth.

72,148.—LATHE FOR TURNING SHAFTING.—Aurin Wood, Worcester, Mass.
I claim, 1st, The combination with the bed of the lathe, provided with a reservoir or receptacle, as described, of the sliding tool carriage and the pump, attached to and moving with said carriage, substantially as and for the purposes shown and set forth.
2d, The combination with the sliding tool carriage and pump, mounted upon said carriage, of the cup, C, and tube connecting said cup with the pump, substantially in the manner and for the purposes herein shown and described.
3d, The method of operating the pump by connecting the piston rod of the same with a friction wheel, actuated by the rotation of the shaft which is being turned in the machine, in the manner herein shown and specified.

72,149.—FINGER BAR FOR HARVESTER.—Walter A. Wood, Hoosick Falls, N. Y.
I claim, bevelling off the front upper corner of the finger bar, to afford a seat for the sickle or scythe bar, to vibrate upon, in combination with bevelling off the lower side of the finger bar, for the reception of the guard finger.

72,150.—CURTAIN FIXTURE.—William H. Woods, Philadelphia, Pa.
I claim the lever dog, e, with the cross foot, c, engaging and disengaging the teeth of the rack, b b, in combination with the swivelled knob, d, having a cross bar, g, and working in the slot, a a, of the racket case, A, substantially as and for the purpose herein described.

72,151.—CHIMNEY.—Ebenezer S. Phelps, Jr., Wyanet, Ill.
I claim the device above described, consisting of the iron box, A, and drawer, B, constructed and arranged as shown, when used in combination with the chimney, D, substantially in the manner and for the purposes specified.

REISSUES.

62,057.—BRICK MACHINE.—Philip H. Kells, Adrian, Mich. Dated March 19, 1867. Reissue 2,810.
I claim, 1st, The combination of the annular mold bed, B, and the central hub or support, C, substantially as described and represented.
2d, The adjustable wedge-shaped cut off, d, arranged and employed in the manner and for the purpose explained.
3d, The arrangement upon the mold wheel of the two pug mills on opposite portions, substantially as described.
4th, An annular mold wheel, provided with cogs or gear teeth upon its periphery, and mounted upon a central hub or support, substantially as and for the purpose set forth.

DESIGNS.

2,846.—MASONIC BADGE.—Virgil Price, New York city.
2,847.—COOK'S STOVE.—Russell Wheeler, Utica, N. Y.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

40,571.—ROTARY ENGINE.—Metropolitan Rotary Engine Co. (assignees by mesne assignments of Adolph Mildechan), New York city. Dated Nov. 10, 1863. Application for reissue received and filed Sept. 27, 1867.
1st, The combination with the outer stationary case, d, and its concentric inner cylinder or flanges, x, of the eccentric wheel, ring or rim, c, fast to the rotating shaft and carrying radial slides or pistons for simultaneous action and exposure to the steam or fluid in chambers, y and z, on opposite sides or peripheries of the ring, c, essentially as herein set forth.
2d, The pipes, l l n and o, and valves or cocks k k' m' and m', in combination with the ring, c, and pistons acting in the steam spaces, y and z, substantially as specified.

2,821 (whole No. 33,825).—LAMP.—Charles W. Cahoon, Portland, Me. Dated Dec. 3, 1861. Application for reissue received and filed Nov. 22, 1867.
1st, A lever with chimney fastenings having that part of it on which the chimney rests extended so as to form a deflector, substantially as described.
2d, The deflector board or flat shaped or nearly so when made not only as a deflector but partly as a chimney holder, substantially as described.
3d, The combination of the said deflector with the conical foraminous piece of metal and the cylindrical tubular air screen for the purpose of forming the air chamber, A, protecting the flame and admitting the air from below the same, substantially as described.
4th, The combination with the lever for raising the chimney of the deflector, air screen and foraminous piece of metal, substantially as and for the purposes specified.
5th, The ring surrounding the wick tube a little above the top of the same with the standards, s s, substantially as and for the purposes specified.
6th, A chimney holder having a projection for manipulating the same, chimney fastenings, a deflector and a joint, substantially as and for the purposes set forth.
7th, The combination of the ring, f, supports, s s, and air screen, c, substantially as and for the purpose set forth.
8th, The combination of the glass body of a lamp with a metallic handle, substantially as and for the purpose set forth.

61,956.—COOKING STOVE.—J. J. Savage, Troy, N. Y. Dated Feb. 12, 1867. Application for reissue received and filed Dec. 4, 1867.
1st, I claim constructing a heating stove with its fuel door way or aperture, B, below and forward of its flame or combustion chamber and contiguous to or adjoining its fire box, A, in manner substantially as and for the purposes herein set forth.
2d, I claim the combination of the fuel door way or aperture, B, and the fire box, A, extended contiguously thereunder as applied to heating stoves, in manner substantially as and for the purposes set forth.
3d, I claim, in combination with a heating stove having its fuel door way in the position as herein described, the employment therewith of a lifting lever, F, substantially in manner as and for the purposes herein set forth.
4th, I claim, in a heating stove, in combination with a fire box, back lining plates and its fuel door way or aperture, B, the arrangement of a front lining plate, E, in position between the flame chamber, C, and the said fuel aperture, in manner substantially as and for the purpose set forth.
5th, in combination with a lever lifter, F, applied to heating stoves in manner as herein described, I claim the employment of a holding hook, b, and catch ridge, c, substantially as and for the purpose set forth.
6th, I claim so constructing a heating stove in manner substantially as described herein that fresh fuel may be cast directly into its fire box below and between ignited fuel or coke therein, in manner substantially as herein set forth for the purposes specified.

16,944.—GUN POWDER KEG.—Henry E. Irenee L. and Eugene Du Pont (assignees of James Wilson and William Wilson, J. and Charles Green for themselves) Wilmington, Del. Dated March 31, 1857. Application for reissue received and filed Nov. 30, 1867.
1st, As a new article of manufacture a keg or can with a series of corrugations representing hoops which give combined strength and finish.
2d, Casting the female screw for the stopper on a tap or mandrel, as set forth.
3d, The extra ring or boss, D, and head, C, as set forth.

62,693.—MACHINE FOR CUTTING THREADS ON BOLTS.—Schweitzer Patent Bolt Co. (assignees of Franzis Schweitzer), New York city. Dated March 5, 1867. Application for reissue received and filed Nov. 30, 1867.
1st, The sliding or movable heads, N O, in combination with the lever, P, and cutter or dies, a b, substantially as and for the purpose described.
2d, The adjustable lever, P, provided with arms, d e, substantially as and for the purpose set forth.
3d, The elastic rest, g, constructed and operating substantially as and for the purpose shown and described.

52,169.—MARKING WHEEL.—Horace Holt, New York city. Dated Jan. 23, 1866. Application for reissue received and filed Nov. 30, 1867.
1st, The combination of the type wheel, A, inking roller, C, and handle, B, substantially as and for the purpose described.
2d, The ink reservoir, c, in combination with the roller, C, type wheel, A and handle, B, substantially as and for the purpose set forth.
3d, The projecting flanges, b, on the type wheel, A, constructed and operating substantially as and for the purpose described.
4th, The stop, h, in combination with the type wheel, A, and handle, B, substantially as and for the purpose set forth.
5th, The spring, g, in combination with the stop, h, type wheel, A, and handle, B, substantially as and for the purpose described.

18,872.—BORING MACHINE.—A. Wyckoff (assignee by mesne assignments of La Fayette Stevens), Elmira, N. Y. Dated Dec. 15, 1857. Application for reissue received and filed Nov. 29, 1867.
1st, The hollow cylindrical stock of an annular auger in combination with a spiral flange with such a pitch as will remove the cuttings horizontally as made and deliver them from the opening of the annular kerf, substantially as set forth.
2d, The combination of a hollow annular bit having their cutting lips projecting in the direction of the rotation of the bit, a hollow cylindrical stock and a spiral flange, substantially as described.
3d, An annular bit formed in one piece and used in combination with a hollow cylindrical stock for cutting an annular kerf in a stick of timber, substantially as set forth
4th, The loose independent collar, f, provided with knife edges, g g, to keep it from turning for the purpose of furnishing a bearing for the head of the auger while in operation.
5th, The sharp annular spur, c, for the purpose of centering and guiding the auger and at the same time leaving a core of the material bored in the center of the auger, in the manner specified.
6th, The oblique traversing rests, O O, in combination with the screws, t t, and dogs, Q, for the purpose of adjusting the timber to the auger as described and holding it firmly while under the operation of the auger.

66,608.—DREDGING MACHINE.—James H. McLean, St. Louis, Mo. Dated July 9, 1867. Application for reissue received and filed Nov. 8, 1867.
1st, The adjustable dredging frame, C, when such adjustment is produced by a derrick, l l, and fall, when constructed and operated substantially as shown and specified.
2d, The scoops, d, of a dredging machine having circular vertical cutting edges in advance of the usual lateral cutting edge, W, Fig. 1, when constructed and operating substantially as shown and specified.
3d, In combination with the dredging vessel the pins, L, for the purpose of moving the same, substantially as described.
4th, The dredger, the receiving and discharging apron and the derrick of a dredging machine all in combination, when constructed and operated substantially as shown and specified.

49,992.—SLEEPING CAR.—George M. Pullman, Chicago, Ill., assignee of Ben. Field, Albion, N. Y., and George M. Pullman, Chicago, Ill. Dated Sept. 19, 1865. Application for reissue received and filed Nov. 29, 1867.
1st, The berth, A, permanently connected with the side of the car by hinges, B, in combination with the recess to receive the same when turned up, substantially as described.
2d, The employment in combination with the berth, A, as described of jointed suspenders to support the inner side of the berth that will fold together to permit the berth to be turned up, substantially as described.
3d, The employment in combination with the berth, A, as described, of the sliding partition, I, substantially as described.
4th, The employment in combination with the berth, A, as described, of the movable head board, J, substantially as described.
5th, The employment in combination with the berth, A, as described, of a counterpoise to facilitate the handling of the same, substantially as described.
6th, Constructing a car seat with the back and seat cushions hinged together and disconnected from the seat frame so that the back cushion may be placed on the seat frame and the seat cushion extended to meet the seat cushion of the opposite chair, substantially as described.

48,555.—DOOR BOLT.—The Stanley Works (assignees of William H. Hart), New Britain, Conn. Dated July 4, 1865. Application for reissue received and filed Oct. 29, 1867.
1st, Making the barrel of a door or shutter bolt of sheet metal, substantially as shown and described.
2d, The bolt catch or keeper with the base plate formed with a flanch at right angles, substantially as described, that it may be secured by screws parallel with the axis of the bolt, substantially as described.

29,430.—INDEX DOOR PLATE.—E. M. Montague, Boston, Mass., assignee of Nathan Ames, Saugus Center, Mass. Dated July 31, 1860. Application for reissue received and filed Oct 15, 1866.
1st, The use in a door plate of a tablet or slate and an adjustable plate or disk having figures or readable signs or characters, for the purposes specified and set forth.
2d, In combination with the above door plate a rotating disk, C, marked with the hours and parts of an hour, as shown in Fig. 2, said disk being confined in the center to a spindle, D, which passes through the door, substantially as and for the purpose described.
3d, The spring, S, arranged, combined and operating substantially as described.

65,018.—STEAM GENERATOR GAGE LOCK.—Thomas Shaw, Philadelphia, Pa. Dated May 21, 1867. Application for reissue received and filed Oct. 11, 1867.
The construction and arrangement of whistle with gage valve whereby to indicate the sound produced by steam or steam and water commingled or water unmingled with steam, substantially as set foath.

49,847.—STEAM GENERATOR.—John R. Eckman, Green Post office, Pa., assignee of John D. Beers, Philadelphia, Pa. Dated Sept. 12, 1865. Application for reissue received and filed Sept. 30, 1867.
1st, Broadly the circular plate or ring, b, as shown and described.
2d, The plate, H, encircling the fire box, substantially as shown and described.
3d, Forming a water space between the inner surface of the boiler shell, A, and the plate or ring, b, as shown and described.

9,286.—MACHINERY FOR CUTTING LATHS FROM A REVOLVING LOG.—Jonathan C. Brown, Brooklyn, N. Y., assignee of Henry C. Smith, Cleveland, Ohio. Dated Sept. 28, 1852. Application for reissue received and filed Dec. 5, 1867.
1st, Turning the log to be cut by driving the mandrels at each end thereof by gearing them directly with the driving shaft, substantially as and for the purposes set forth.
2d, The dog, A, and its appurtenances for connecting the log with the mandrels and disconnecting it therefrom, as specified.
3d, The combination of the cylinder cutter, K, and the stripping knife moved up simultaneously and automatically, all substantially as and for the purposes set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

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VOL. XVII., No. 26....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, DECEMBER 28, 1867.

Contents:

(Illustrated articles are marked with an asterisk.)

THE LAST NUMBER OF VOLUME XVII.

We give in this number a full index of the volume of which this is the last issue. No doubt this will be more satisfactory to our readers—those at least who preserve their numbers for binding, and probably most do—than publishing the index in a separate sheet. The list of claims in this number will be found to be unusually full, a gratifying evidence that dullness of business does not cripple the resources nor abate the industry of our inventors. With a parting word of good will to our present subscribers and a welcome to those who begin with our new volume, we wish for all a HAPPY NEW YEAR.

COMMENCEMENT OF A NEW VOLUME.

With the next number the SCIENTIFIC AMERICAN enters upon its twenty-third year. Probably no publication extant will furnish a more complete and exhaustive exhibit of the progress of science and the arts in this country for the past twenty-two years than a complete file of the SCIENTIFIC AMERICAN. It is a curious and interesting pastime to compare the condition of the mechanic arts as presented in some of our first volumes with that shown in our more recent ones. During all this time, nearly a quarter of a century, our journal has endeavored to represent the actual condition of our scientific and mechanical progress and to record the discoveries and improvements in these departments wherever made. The result is a compendium of valuable information unattainable through any other means.

But the SCIENTIFIC AMERICAN has aimed not only to gratify a laudable curiosity by collecting and presenting such information, but to give practical knowledge which could be applied to valuable uses.

We labor for the producers—the mechanics, farmers, laborers—those who build up a country and make the wilderness to blossom like the rose. We believe that the workers are the power, especially in this country; and while we do not wish to detract from the value of the products of merely intellectual speculators, we still think that the world needs specially the laborer. We use the term "laborer" in its connection in its widest sense, comprehending he who uses brain as well as he who employs muscle; scientific investigation and discovery should be followed by and united to practical application.

The improvement exhibited in our past volumes will be no less noticeable hereafter. Keeping pace with the "march of mind" we shall endeavor always to lead rather than to follow. The different departments of our paper are managed by those who are practically acquainted with the subjects they profess to elucidate. "To err is human," but we shall spare no pains nor expense to make the SCIENTIFIC AMERICAN as reliable in its statements as it is interesting in the variety and matter of its subjects. There are none of our people, from the student or professional man to the day laborer, but will find something in every number, of present or future value to him in his business.

A CHANGE AT THE PATENT OFFICE.

T. C. Theaker has resigned as Commissioner of Patents. A number of gentlemen are mentioned as candidates for the succession, prominent among whom are B. T. James and Charles Mason. Mr. James has acted in the capacity of primary Examiner in the Engineering Class for a number of years, and has filled his position acceptably. Judge Mason held the Commissionership from 1853 to 1857, and his whole administration was marked with reform and ability. Judge Mason was educated at West Point, and he is a man of sterling integrity, a sound jurist, experienced in patent law, and a splendid executive officer. One thing may be relied upon, if Judge Mason should receive and accept the appointment of Commissioner, inventors will not have to complain long of delay in the examination of their cases. The Judge is as industrious by nature as he is stern and systematic by education and he will have no drones about him. The work of the office under his administration would be brought up and kept up.

A good day for inventors and all persons having business with the Patent Office will dawn when Judge Mason takes the Commissioner's chair again, and we hope the proper influences may be brought to bear to secure his acceptance.

OBITUARY.

EBENEZER WINSHIP, died at his home in this city Dec. 6, 1867, at the age of 67. A long and eminently useful although unobtrusive life entitles his memory to respect. He commenced his career as a mechanic in the steam engine establishment of James P. Allaire, soon after the application of steam for the propulsion of boats and long before its application to ships for the purposes of commerce or war. For fifty-two years, with the exception of one or two brief intervals, he was connected with the Allaire works in this city, and for more than forty years he was the master mechanic and general superintendent of the works. Probably no man now living has had a more intimate connection with the construction of the marine steam engine in all its remarkable changes and improvements, or been so long employed at one engine establishment.

James P. Allaire, the founder of the Allaire Works, died May 20, 1858, at the age of 73. He was an intimate acquaintance of Fulton and from the engine of Fulton's first boat, the *Clermont*, took drawings which he used in the construction of his first marine engines. He built the engines for the *Chancellor Livingston* which ran between New York and Albany. He built also the first marine engines ever constructed in this country, which were put into the steamship *Savannah*, the first steamer that crossed the Atlantic, and also those for the *Pacific* and *Baltic* of the Collins line, which ships surpassed in speed any before constructed.

Under such tutelage and with such advantages Mr. Winship rose successively through the grades of apprentice, journeyman, boss, and foreman, to the position of master mechanic and superintendent. Connected intimately with the progress of marine engineering for over half a century, he was the teacher of a large number of our engineers who now reflect credit upon their instructor. Mr. Winship's professional skill was unsurpassed; his ability in directing and managing others and thorough acquaintance with the minutest details made him invaluable in the position he so long honorably filled. His personal characteristics were faithfulness, industry, earnestness, kindness of heart, and unvarying punctuality and promptness. As master mechanic it was his invariable rule to be at the works an hour before the time for beginning labor to lay out the work for the hands, getting his breakfast in winter by gaslight and returning from dinner in time to see the condition of the work before the men arrived. In short, he made his employers' business his own and neglected nothing which might contribute to their success. He was a connecting link between the present generation of mechanics and that which saw the beginings of that great power, steam, which has revolutionized the world. His funeral on the 8th of December was attended by all the employés of the Allaire Works, by many from other mechanical establishments, and a large number of citizens.

How to Make Intelligent Workmen---Go and Do Likewise.

Mr. H. O. Osborn, of Castleton, Vt., in a letter covering an order for a club of subscribers, says:—"It may not be uninteresting to you to learn that the last six names are those of young men in my employ. I have myself been your subscriber for the past four years, and knowing as I did the value of your paper, I felt it a duty I owed to my men to recommend the paper to their notice, and the result is as above. I am proud to think that I have so many in my mill who can appreciate its worth. I hope at no remote date to send you another list of names from among my own men, and I am certain that if every manufacturer would consult his own best interest he would do all he could to place your paper in the hands of his workmen, for I feel it to be a valuable acquisition to all in any way connected with machines."

We believe that employers who wish to improve the condition of their employés can render them no better service than to make each of them a Christmas present of a year's subscription to this paper. Send in the names early, so that we may know how large an edition to print to supply the demand. We close this Volume with over 30,000—nearly 35,000—subscribers, and we wish to commence the new with at least 50,000. Send in your names.

The Iron-Clads at Sea.

In his last annual report to Congress, the Secretary of the Navy thus refers to the cruise of the *Miantonomah* to Europe and her return and of the *Monadnock* to San Francisco, voyages the most remarkable ever undertaken by turreted iron-clad vessels. These vessels encountered every variety of weather, and under all circumstances proved themselves to be staunch, reliable sea-going ships. The monitor type of vessel has been constructed primarily for harbor defence, and it was not contemplated that they would do more than move from port to port on our own coast. These voyages demonstrate their ability to go to any part of the world, and it is believed by experienced naval officers that with slight modifications above the water line, in no way interfering with their efficiency in action, they will safely make the longest and most difficult voyages without convoy.

Steam, turreted iron-clads and fifteen-inch guns have revolutionized naval warfare, and foreign governments, becoming sensible of this great change, are slowly but surely coming to the conclusion that turreted vessels and heavy ordnance are essential parts of an efficient fighting navy.

THE SCIENTIFIC AMERICAN AS A MEDIUM OF BUSINESS.

We seldom publish the favorable opinions expressed by our correspondents when in their letters they allude to this journal. If we chose we could fill columns with notices similar to those which follow.

R. S. Miller of Logansport, Ind., under date of Dec. 2d, says:—

I have a club of 10 or 12 engaged, and will send names and money about the 20th inst. I have been reading the SCIENTIFIC AMERICAN for several years and frequently I find items in it of more value than the year's subscription. In No. 9, present volume, you illustrated a plan for setting steam boilers. I was much pleased with it and showed it to a friend of mine who was about re-setting a 60-horse power boiler in his machine shop. He adopted the plan. Four week's use of the improved furnace proves all you claimed for it. My friend will be one of your new subscribers. I shall, in a few days, re-set my 15-horse power boiler according to the plan. Every live mechanic should take your valuable journal.

The Lamb Knitting Machine Manufacturing Co, Chicopee Falls, Mass., say:—

In payment of your bill please find inclosed draft, etc. Please insert our advertisement every other week hereafter. We are compelled to this being overrun with orders. Unless they hold up we shall be obliged to withdraw it entirely. So much for the advantages of your medium for advertising.

C. W. Le Count, Manufacturer of lathe dogs and steam engine governors, South Norwalk, Conn., writes concerning his advertisement in these columns:

What business I have I can trace three-quarters of it directly to your journal.

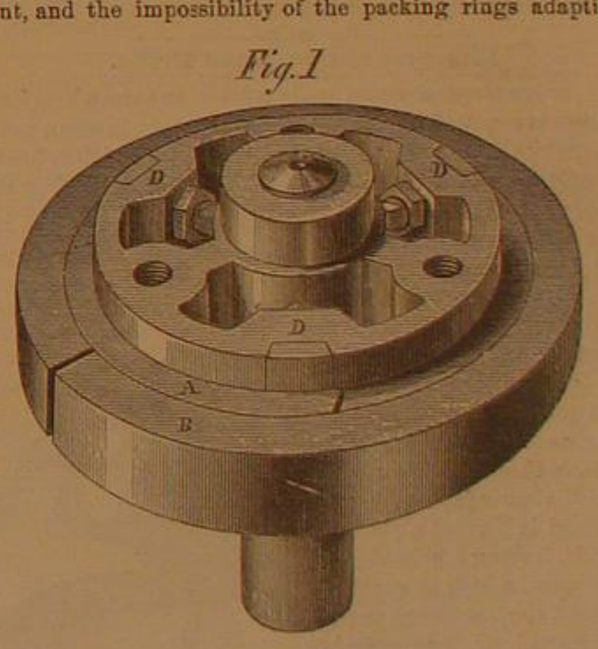
An agent of the Hinkley Knitting Machine Co., whose invention was illustrated in these columns some weeks ago, writes:

It is now but ten days since its publication, yet without a single advertisement in any paper I have been obliged to engage extra assistance to simply inclose my circulars to parties, who are writing and even *telegraphing* for agencies and machines, while many have traveled long distances to personally engage agencies. The Superintendent of the Company makes similar *complaints*.

HUNT'S IMPROVED STEAM PACKING PISTON.

Engineers are aware that there are more or less objections to the use of the ordinary spring pistons, owing to the changing tension of the springs, the necessity of frequent adjustment, and the impossibility of the packing rings adapting

Fig. 1



themselves to the varying pressures of the steam on the piston. A number of attempts have been made to produce a self packing or steam expanding piston, which will act always with the pressure of the steam and the velocity of the engine. The advantages of such a piston will be readily appreciated by practical engineers, especially drivers of locomotives, working, as they nearly all do, at a very high pressure of steam. The general complaint against the several packings in use on our railroads is, that they "pack too tight," and rapidly wear out the rings, while the only remedy has

Fig. 2

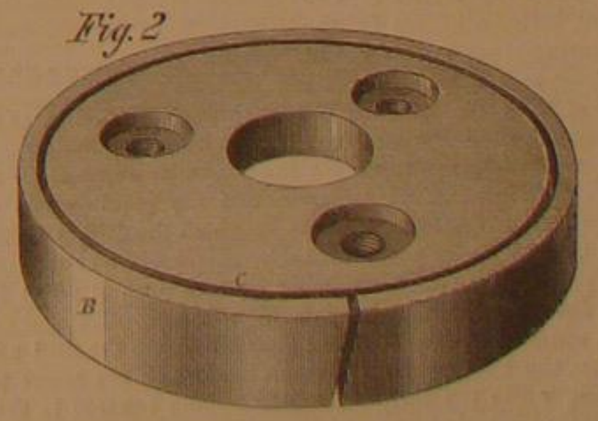
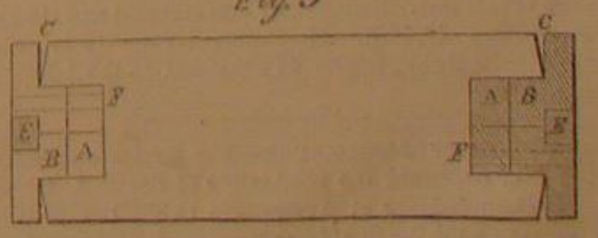


Fig. 3



been, the extremely uncertain one of contracting the openings by which steam is admitted under the ring, or rings, to expand them. The obvious objection to such an arrangement is, that it allows the steam to act on the rings with its full force during slow motion, as when a train is starting, while if effective under any circumstances, it will be so only at comparatively high piston speed. The efficacy of such a remedy, if it possesses any, is in fact inversely as the piston speed.

Fig. 1 is a perspective of the piston itself, or the "spider," with its follower and its rings removed, which are shown in Fig. 2. Fig. 3 is a cross section of another form of the piston, to be presently described, but which will serve to explain that shown in Figs. 1 and 2. Next to the core of the spider are two narrow internal rings, A, in Figs. 1 and 3; surrounding these two outer rings, B, the cross section of which is of L-form, as seen in Fig. 3. The lips of these outer rings extend to the whole thickness of the piston. The flange head of the piston, and also the follower, are turned beveling on their edges to admit the steam around the annular space thus formed under the rings, B. These spaces are plainly exhibited at C, in Figs. 2 and 3. Both inner and outer rings are adjusted to the bore of the cylinder by means of the gibs, D, and set screws seen in Fig. 1.

The section, Fig. 3, represents a modification intended for use in vertical cylinders, if considered necessary. The additional center ring, E, is intended to prevent leakage through the cut in the expanded ring and over the face of the unexpanded one, which might occur when the rings and cylinder should become so worn that the rings, when not expanded, should collapse and leave the surface of the cylinder. The rivets, F, shown by the dotted lines, are placed near the cuts in the L-rings, and are intended to hold the outside and inside rings together at that point, and prevent any tendency on the part of the latter to collapse and let steam under that part of the L-rings. Probably, however, if the packing is properly constructed and adjusted in the first instance, these devices will be unnecessary. In horizontal cylinders the weight of the piston, if properly supported on the set screws and gibs, will accomplish these objects, if the cuts in the L-rings are placed near the bottom side of the cylinder. The steam enters the annular space between the beveled edges of the spider flange and follower and the inner periphery of the overhanging part of the L-rings, and acts only on that part.

Patented by Nathan Hunt, Sept. 17, 1867. For further information address the patentee, or Sharps, Davis & Bonsall, Salem, Ohio, who will furnish piston heads to order on receipt of size of cylinder and piston rod.

Improvement in Hand Drills.

There are frequent occasions in a machine shop where light drilling is required on work it is inconvenient to bring to the lathe. For this the Scotch or ratchet drill, if the job is heavy, is employed, and if light, the breast drill. The placing and working of the former consumes considerable time, and the labor of drilling with the breast drill is excessive and exhausting. It is difficult also to hold the instrument so steady as not to cramp and break the drill. The combination of the drill with tongs and a pivoted bed piece, as seen in the engraving, obviates these objections.

NEVERGOLD & STACKHOUSE'S TONGS DRILL.

To the lower jaw, A, of a pair of tongs is pivoted a platen or bed, B, having a hole through its center, which is continued through the jaw for the passage of the drillings. The upper jaw is formed with a circular flange on which is mounted the circular or disk-like base, C, of the drill frame, D. This, with the frame, is secured on the jaw of the tongs by means of two screw bolts—one seen in the engraving—passing through the jaw and screwing into the base of the drill. These bolts pass through semi-circular or segmental slots, by which the drill frame can be swung around at different angles to the tongs, to adapt itself to the convenience of the workman and the requirements of the work. If desired, the crank by which the drill is driven may be used on the upright spindle, E. It will be seen that the pivoted base or bed, B, will allow the work to adapt itself always to the line of the drill.

In operation, the work being placed between the drill and platen, the left hand presses the handles of the tongs together, while the right turns the crank; the feed is thus graduated wholly by the pressure of the hand. No further description is required for understanding the construction or operation of this tool. Patented by F. Nevergold and George Stackhouse, June 19, 1866. Applications for the whole right, or for territorial rights, should be addressed to the latter at Pittsburgh, Pa.

Commissioner of Agriculture.—The Senate on Friday, the 29th ult., confirmed the nomination of the Hon. Horace Capron as Commissioner of Agriculture to fill the position made vacant by the death of Isaac Newton, the former head of the Department.

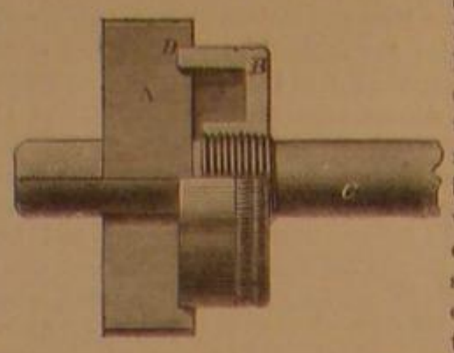
It is estimated that 10,000,000 feet of sawed lumber is frozen up in the docks at Bangor, Maine, three fourths of which is sold and waiting shipment.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Improved Method of Securing Cutters on Boring Bars.

Messrs. Editors:—Thinking it may be of use to some of the readers of your invaluable paper, I have taken the liberty of sending you a sketch of a new mode of securing the cutter in a boring bar or pin drill. Where the cutters are secured, as usual, by a key, all mechanics know that it is very difficult to set a cutter twice alike; and the notch, which is filed in the cutter, to prevent it from moving endways, is a great source of weakness, often causing the cutters to crack in hardening, as well as after they are put to work. The inclosed sketch will explain itself:



A is a cutter, and B a collar, screwed upon the cutter bar, C. The edge of this collar fits into a notch on either end of the cutter, as shown at D, thus leaving the cutter as strong as possible at the center, and giving it a solid support at the point where support is needed, and at the same time insuring its always coming alike.

Brooklyn, N. Y. Theodore L. Webster.

[The device seems to be eminently well calculated for the support of the cutter on a boring bar, and is applicable, with but slight modification, to a pin or "teat" drill. Machinists will readily perceive its operation and excellencies.—Eds.

Tides and Their Causes.

The phenomenon of the daily tides of our seacoasts and tidal rivers is attributed to the attraction of the moon upon the earth—that the moon draws the earth towards it, and that in drawing the earth towards it, it bulges up the water of the ocean on the side presented towards the moon, and drawing the earth and water thus on that side, also draws the earth *away* from the water on the opposite side of it, and thus leaves the water bulged up on *that* side, and in doing all this the effect comes after the cause some three hours, which is termed "the tide lagging behind." Now if we knew, *per se*, what attraction of gravitation was, and that it produced this anomaly of force, there would be nothing to question in the matter. But as we only know by attraction that it means *drawing to*, it is impossible to reconcile the theory of the tides as they run to the attraction of the moon. If the moon is so potent in drawing up, why does it not draw a bulge on the inland seas—our great lakes? I will not discuss the question of the moon's Apogee and Perigee—its different velocities in different pasts of its orbit, as laid down by the law of Kepler, or whether it turns once on its axis in a month, or not, as either theory will answer for its phases, as well as for the face of the "Man in the Moon," but I will endeavor to give a more rational theory for the phenomenon of the daily tides.

The earth revolves on its axis and makes a revolution every twenty-four hours, and this moves its equatorial surface nearly a thousand miles per hour. Now the water on its surface, covering about three-fourths of it, and being more mobile than the solid earth, is, by centrifugal force, made to roll around the earth, the same as the water is made to move around the grindstone when in motion, a thing familiar to every body that uses that instrument. In the Southern Ocean this motion of the water is so well known to mariners who double Cape Horn in sailing from San Francisco to New York, that they now run considerably lower down in order to ride this tide eastward, than they did in former times. Here then we have one fact of water tide more comprehensive, at least, than the tractive theory of the moon. We have also the fact of two great promontories in Capes Horn and Good Hope, where this great tidal wave must strike against, and they produce constant oscillations of the water to and fro, and produce gurgitation and regurgitation in all the gulfs and rivers that line the coasts of the Northern, or more properly, the Land Hemisphere. These gurgitations swell the water highest in the places where the seas become the narrowest, as the more northern latitudes. In addition to these daily oscillations of the water, there are constant eddy currents, denominated "Gulf Streams," all agreeing in their courses and motion to this theory of the ocean tides.

When our present received tide theory of moon attraction was first laid down, the fact of the water of the great Southern ocean rolling round faster than the solid parts of our planets was not known. Smith, in his Physical Geography, says, "The tidal wave flows from east to west, owing to the earth's daily rotation in a contrary direction." Here he is unintentionally correct, because the water striking these promontories of the two great capes, is hurled back, and not, as he assumes, that the great ocean wave is moving from east to west. The United States government sailing charts lay down the fact of this great ocean wave moving from west to east, south of the capes, and the ships coming from the Pacific to the Atlantic ocean take advantage of this, and ride the sea at the rate of over twenty knots per hour, by following the routes laid down in Maury's charts.

The old philosophy of the crystalline spheres was not more at variance with the correct motion of the stars and planets, than the moon theory of the tides. In their dilemma to account for the retrograde motions of the planets, they denominated them wanderers, straggiers, because they would not march with the "music of the spheres." In the moon theory of the tides the lunar satellite is made to pull and push at one and the same time, which is entirely at variance with the philosophy of force.

There is nothing in the heavens, nor in the earth, that proves to us positively that the sun holds the planets, and the planets their satellites, by attraction, as we are taught that the moon attracts the water of our world. We see that all terrestrial bodies tend toward the center of the earth, and we call this gravitation; but we cannot see how a body moves around the earth without falling on it, by this law. We say in dynamic philosophy, that bodies move in the direction of least resistance, and *that* we can positively understand; but what force *per se* is, we do not know. It is always better for us to explain phenomena by positive known laws and motions, than by any that rest merely upon conjecture.

Lancaster, Pa. Jno. Wise.

The Great Hoosac Tunnel.

Messrs. Editors:—In No. 23, Vol. XVII., of your paper, is an article upon the Hoosac Tunnel, but made up from data nearly a year old, and consequently not correctly representing the tunnel as it is at the present time. Your conclusions of course were based upon the same data; but during the past year, and especially during the past five months, much greater progress has been made than ever before upon the work, and a knowledge of what has been done since the last report was issued will, I think, give you a different impression of the time required for its final completion.

Referring to the profile in that number of the Scientific American, the following are the distances to the various points where the work is being prosecuted:

Distance from east end to central shaft		12,837.264	feet.
" "	central shaft to west shaft	9,747.072	"
" "	west shaft to new shaft	265.000	"
" "	new shaft to well No. 4	629.150	"
" "	well No. 4 to pier*	1,522.825	"
" "	east end to pier*	25,031.341	"

* The instrument pier is 4 feet west of the present west end of the tunnel.

The following are the lengths of the headings at the various points of the work, Dec. 2, 1867:

Length of east end heading		4,608.000	feet.
" "	west shaft, east heading	1,302.000	"
" "	" " west heading	611.000	"
" "	west end heading	617.000	"
Total length of headings		7,038.000	"
Leaving		17,993.341	"

or 3,396 miles of heading yet to be made, of which 1,218.975 feet are between the west end and the west shaft, and 16,714.366 feet between the west shaft and east end of the tunnel.

The central shaft is down 583 feet, and well No. 4 is down 150 feet.

The progress for the month of November, 1867, was as follows:

East end heading	126.00	feet.
West shaft, east heading	33.00	"
" " west heading	5.00	"
West end	20.00	"
Total for the month of November	184.00	"

Thirty feet of brick arch were completed during the month at the west end, making a total of 516 feet of brick arch completed to date.

The progress for the last six months has been as follows:

East end	711.00	feet.
West shaft, east heading	216.00	"
" " west "	288.00	"
West end	180.00	"
Total, from June 1, to Dec. 2	1,295.00	"
" for the previous six months	632.00	"
" " " year ending Dec. 2, 1867	2,027.00	"

The new shaft has been sunk, and at its foot are the pumps which, together with those at the west shaft, are now throwing out between 900 and 1,000 gallons of water per minute.

During the last month great quantities of water were struck at both headings of the west shaft (70 gallons per minute at the east heading in one day), and the work was stopped in consequence, which accounts for the small progress at this point. A new pump of 1,000 gallons per minute capacity will be at work, in addition to the above, in a few days, and the work can then go forward with increased rapidity.

Well No. 4 is an artesian well, which is now being carried down as a shaft to afford two more faces to work from. Its depth will be, when finished, 215 feet, its dimensions 8 by 8 feet.

At the rate of progress for the past year it will require but eight years and ten months to pierce through the mountain

and at the rate for the past six months it will require but six years and five months. But when the central shaft and well No. 4 are sunk to grade the number of faces to work from will be doubled, and the time of completion thereby greatly diminished. At present drilling machines are employed only at the east end, but in a few weeks they will be used at the west shaft, and also at the central shaft as soon as the buildings and machinery are again in place, and this again will hasten the completion of the work. At the west shaft buildings are already erected for the manufacture of nitro-glycerin, and the use of this powerful explosive will be adopted during the present month. In fine, every means that will hasten the work will be employed, and ere the present generation passes away, and even within from four to seven years, trains loaded with freights and passengers will pass and repass through the great heart of the Hoosac Mountain as an hourly occurrence.

A. BEARDSLEY, C. E., Asst. Engineer.

North Adams, Mass.

Horse-hair Snakes--Wonderful Transformation.

MESSRS. EDITORS:—In No. 21, current volume, you referred H. K., of Wis., who had described the horse-hair snake, to page 280, No. 18 current volume, for a reply, which you considered "sufficient." With your kind permission I would like to speak a few words about the "snakes" in question. When I resided in Pennsylvania, I, in company with many other lads, used to tie a bundle of horse hairs into a hard knot and then immerse them in the brook, when the water began to get warm, and in due time we would have just as many animals, with the power of locomotion and appearance of snakes, as there were hairs in the bundle. I have raised them one-eighth of an inch in diameter, with perceptible eyes and mouth on the butt end or root part of the hair. Take such a snake and dip it in an alkaline solution, and the flesh or mucus that formed about the hair will dissolve, and the veritable horse hair is left. They will not generate in limestone water, only in freestone or salt water.

Covington, Ky. T. W. B.

Man Proposes, but God Disposes.

It may not be generally known that but for one of those accidents which seem to be almost a direct interposition of Providence, Prof. Morse, the originator of the magnetic telegraph, might have been now an artist instead of the inventor of the telegraph, and that agent of civilization be either unknown or just discovered. We publish from Tuckerman's "Book of the Artists" just from the press of G. P. Putnam & Son, the following reminiscence of Prof. Morse:

"A striking evidence of the waywardness of destiny is afforded by the experience of this artist, if we pass at once from this early and hopeful moment to a more recent incident. He then aimed at renown through devotion to the beautiful; but it would seem as if the genius of his country, in spite of himself, led him to this object, by the less flowery path of utility. He desired to identify his name with art, but it has become far more widely associated with science. A series of bitter disappointments obliged him to "coin his mind for bread", for a long period, of exclusive attention to portrait painting, although, at rare intervals, he accomplished something more satisfactory. More than thirty years since, on a voyage from Europe, in a conversation with his fellow passengers, the theme of discourse happened to be the electro-magnet; and one gentleman present related some experiments he had lately witnessed at Paris, which proved the almost incalculable rapidity of movement with which electricity was disseminated. The idea suggested itself to the active mind of the artist, that this wonderful and but partially explored agent might be rendered subservient to that system of intercommunication which had become so important a principle of modern civilization. He brooded over the subject as he walked the deck, or lay wakeful in his berth, and by the time he arrived at New York, had so far matured his invention as to have decided upon a telegraph of signs, which is essentially that now in use. After having sufficiently demonstrated his discovery to the scientific, a long period of toil, anxiety, and suspense intervened before he obtained the requisite facilities for the establishment of the magnetic telegraph. It is now in daily operation in the United States, and its superiority over all similar inventions abroad was confirmed by the testimony of Arago and the appropriation made for its erection by the French Government.

"By one of those coincidences which would be thought appropriate for romance, but which are more common, in fact, than the unobservant are disposed to confess, these two most brilliant events in the painter's life—his first successful work of art and the triumph of his scientific discovery—were brought together, as it were, in a manner singularly fitted to impress the imagination. Six copies of his "Dying Hercules" had been made in London, and the mold was then destroyed. Four of these were distributed by the artist to academies, one he retained, and the last was given to Mr. Bulfinch, the architect of the Capitol—who was engaged at the time upon that building. After the lapse of many years, an accident ruined Morse's own copy, and a similar fate had overtaken the others, at least in America. After vain endeavors to regain one of these trophies of his youthful career, he at length despaired of seeing again what could not fail to be endeared to his memory by the most interesting associations. One day he was superintending the preparations for the first establishment of his telegraph in the room assigned at the Capitol. His perseverence and self-denying labor had at length met its just reward, and he was taking the first active step to obtain a substantial benefit from his invention. It became necessary in locating the wires, to descend into a vault beneath the apartment, which had not been opened for a long period. A man preceded the artist with a lamp. As they passed along the subterranean chamber the latter's attention was excited by something white glimmering through the darkness. In approaching the object, what was his surprise to find himself gazing upon his long-lost Hercules, which he had not seen for twenty years. A little reflection explained the apparent miracle. This was undoubtedly the copy given to his deceased friend, the architect, and temporarily deposited in the vault for safety, and undiscovered after his death.

Extraordinary Effects of an Earthquake---An American Man-of-War Carried Over the Tops of Warehouses and Stranded.

[OFFICIAL REPORT.]

UNITED STATES STEAMSHIP "MONONGAHELA," ST. CROIX, Nov. 21, 1867.

SIR:—I have to state, with deep regret, that the United States steamship *Monongahela*, under my command, is now lying on the beach in front of the town of Frederickstadt, St. Croix, where she was thrown by the most fearful earthquake ever known here. The shock occurred at 3 o'clock, P. M., of the 18th inst. Up to that moment the weather was serene, and no indication of a change showed by the barometer, which stood at 30 degrees 15 minutes. The first indication we had of the earthquake was a violent trembling of the ship, resembling the blowing off of steam. This lasted some 30 seconds, and immediately afterward the water was observed to be receding rapidly from the beach. In a moment the current was changed, and bore the ship toward the beach, carrying out the entire cable and drawing the bolts from the kelson, without the slightest effect in checking her terrific speed toward the beach. Another anchor was ordered to be let go, but in a few seconds she was in too shoal water for this to avail. When within a few yards of the beach, the reflux of the water checked her speed for a moment, and a light breeze from the land gave me a momentary hope that the jib and foretopmost staysail might pay her head off shore, so that in the reflux of the wave she might reach waters sufficiently deep to float her, and then be brought up by the other anchor. These sails were immediately set, and she payed off so as to bring her broadside to the beach. When the sea returned, in the form of a wall of water 25 or 30 feet high, it carried us over the warehouses into the first street of the town. This wave in receding took her back toward the beach, and left her nearly perpendicular on the edge of a coral reef, where she has now keeled over to an angle of 15 degrees.

All this was the work of a few moments only, and soon after the waters of the bay subsided into their naturally tranquil state, leaving us high and dry upon the beach. During her progress toward the beach she struck heavily two or three times; the first lurch carried the rifle gun on the forecastle overboard. Had the ship been carried 10 or 15 feet further out, she must inevitably have been forced over on her beam ends, resulting, I fear, in her total destruction, and in the loss of many lives. Providentially only four men were lost; these were in the boats at the time the shock commenced. The boats that were down were all swamped except my gig, which was crushed under the keel, killing my coxswain, a most valuable man. During this terrific scene the officers and men behaved with coolness and subordination. It affords me great pleasure to state, that, after a careful examination of the position and condition of the ship, I am enabled to report that she has sustained no irreparable damage to her hull. The sternpost is bent, and some 20 feet of her keel partially gone; propeller and shaft uninjured. The lower pintle of the rudder is gone, but no other damage is sustained by it. No damage is done to her hull more serious than the loss of several sheets of copper, torn from her starboard bilge and from her keel.

She now lies on the edge of a coral reef, which forms a solid foundation, on which ways may be laid. She can thus be launched in 10 feet of water at 100 feet from the beach. Gentlemen looking at the ship from shore declare that the bottom of the bay was visible where there was before, and is now, 40 fathoms of water.

To extricate the ship from her position I respectfully suggest that Mr. I. Hanscom be sent down with suitable material for ways, ready for laying down, and india-rubber camels to buoy her up. I think there is no insuperable obstacle to her being put afloat, providing a gang of ten or twelve good ship carpenters be sent down with the Naval Constructor, as her boilers and engines appear to have sustained no injury. A valuable ship may thus be saved to the navy, with all her stores and equipments.

S. B. BISSELL, Commodore Commanding.

Rear-Admiral J. S. Palmer, commanding H. A. Squadron, St. Thomas.

THE survey of another trans-continental railway route, which shall follow mainly the 35th parallel of latitude, is nearly completed. Its projectors claim this as the most feasible one across the continent, and even if the northern and southern roads are constructed, this would still be the favorite popular thoroughfare, and the easiest and cheapest built.

THE CHILIAN GUN now being built at Pittsburgh, is 23½ feet in length, being two feet longer than the famous Rodman gun at Fort Hamilton, this harbor, but of exactly the same bore, twenty inches. Its greatest diameter is 5 feet 4 inches, its least diameter, 2 feet 9 inches. The gun is designed for garrison or naval service.

FROM lack of economy, in reduction of ores, it is estimated that the aggregate loss on the production of bullion in this country for the present year will reach the sum of $25,000,000.

Recent American and Foreign Patents.

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

WARDROBE.—Nathan Turner, West Lynn, Mass.—This invention consists in a movable or swinging arrangement of the sides and top and bottom, whereby they are folded upon each other, with grooves or strips in or upon the sides to support shelves when used as a closet or book case, and which shelves may be removed when used as a wardrobe.

AXLE BOX.—Henry B. Pitner, La Porte, Ind.—This invention consists of an iron thimble or sleeve provided on each end in the inside with a screw thread, into which are fitted ends of brass or composition, or other metal softer than iron, in such a way that said metallic ends will not turn in the box, and so that the axle bears only upon the softer metal.

SPRING FORMER.—George S. Long, Bridgeport, Conn.—This invention consists of a vibrating anvil or former, upon which the steel to be worked is placed, said former vibrating under a roller, said roller being hollow, and provided with holes or orifices through which water received in the shaft of said roller is distributed upon the heated steel.

DOOR-FASTENER.—Francis C. Levalley, Warrenville, N. Y.—The present invention relates to a fastener for doors more particularly, which, in the construction and arrangement of its parts, is simple, and most effective, and secure, when fastened.

ROOFING.—Orville Manly, Garrettsville, Ohio.—This invention consists of tiles saturated with raw coal tar, made in the same way as ordinary brick, having all the edges bevelled, being thicker at one end, and laid upon the roof with the thicker end towards the eaves, and the spaces between the tiles formed by the bevelled sides of the same filled with a cement made of raw coal and clay.

FOLDING BEDSTEAD OR CRIB.—H. S. Titcomb, Gloversville, N. Y.—This invention consists of the parts being attached to each other by pivots and hinges, whereby the same may be folded in upon the bed and clothing, and upon each other.

CAST METAL CASES FOR SPRING BALANCES.—John Chattillon, New York city.—This invention relates to a new manner of arranging the cast metal cases for spring balances, so that they can be made less expensive and simpler than they are now made, and consists in fitting the iron, to which the upper end of the spring is secured, directly through the upper head of the case, instead of using an additional head in the case for that purpose.

TWEERS.—John B. Himberg, Frederick City, Md.—This invention relates to a new tweers, which is so arranged that the center part or ring can be easily taken out, whenever desired, but not accidentally, by a hook or stirrer, and that it can be easily cleaned and taken apart whenever desired, and that it may conduct a strong blast of air to the fire.

PUNCH.—C. D. Flesche, New York city.—This invention consists in arranging a punch in such a manner that it consists of two parts, which are firmly connected together for cutting the metal, while for bending the same, an inner sliding punch will be moved out of the stationary cutting punch, thus making both operations by one instrument, and avoiding the removal of the article from the cutting to the bending punch, which was heretofore necessary.

RAILROAD CHAIR.—Leander Pollock, Matteawan, N.Y.—This invention consists in making the chair of two pieces, each piece consisting of one cheek and of a portion of the case. When the two pieces are connected, the base of one rests upon the base of the other, the line of division between the two bases being inclined so that as the rail presses upon the upper base, it will tend to force the same downward on the incline, whereby the two cheeks will be brought together.

FIRE LADDER.—Johan Blomgren, Galesburg, Ill.—The main feature in this invention is a telescopic tube, expanded or closed by a coil fitting within it, and worked by a toothed wheel.

HARVESTER.—Francis C. Coppage, Terre Haute, Ind.—The object of my invention is to render more simple and effective the machinery for operating and adjusting the cutter bar and the reel of harvesters.

BOAT-DETACHING APPARATUS.—David L. Cohen, Pensacola, Fla.—The object of this invention is to furnish a device by which a ship's boat can be readily shipped or launched at sea, without danger of capsizing or fouling.

DEVICE FOR HITCHING HORSES.—Samuel Galbraith, New Orleans, La.—This invention is a neat, cheap, and durable device, designed to be attached to halters used in hitching horses, mules, etc., to prevent their being thrown, hung, or injured.

HYDROSTATIC MACHINE.—Dr. J. R. Cole, Kenton Station, Tenn.—The object of this invention is to construct a machine which, by the application of but little power, will raise a stream of water to any desired hight, to furnish motive power for machinery or for other purposes.

FENCE POST.—Robert Ramsay, New Wilmington, Pa.—In this invention the bottom of the post is supported between two parallel sills a short distance from the ground, the post being dovetailed and held by keys passing across the sills, and being adjusted high or low, or at any inclination, by making the keys larger or smaller, or of different sizes.

SELF-LOADING EXCAVATOR.—Benj. Slusser, Sidney, Ohio.—In this invention a pinion, attached to the forward axle is made to elevate the plow, when desired, and at the same instant to ungear and stop the endless apron carrier that conveys the dirt from the plow to the cart. A new method of instantly unloading the cart, and setting it again to receive another load, is shown.

WASHING MACHINE.—J. Q. Leffingwell, Nevada, Iowa.—This invention relates to an improvement in washing machines, and consists of a vibrating semi-cylindrical box operated by a means of a lever handle and gearing.

SCAFFOLD FOR BUILDERS, ETC.—John E. Bliss, Oxford, Ind.—This invention has for its object to furnish an improved scaffold for the use of carpenters, masons, painters, etc., which shall be simple in construction, strong, durable and easily adjusted to any desired hight.

PLOW.—Harvey Briggs, Smithland, Ky.—This invention has for its object to furnish an improved plow for breaking up sod or prairie land, which shall be strong and durable in construction and effective in operation.

CORN PLOW.—John Snyder, Williamsfield, Ohio.—This invention has for its object to furnish an improved plow for plowing and hoeing corn, which shall be simple and strong in construction and will do its work well.

SELF-RAKING ATTACHMENT FOR REAPERS.—James H. Glass and Albert J. Glass, McGregor, Iowa.—This invention has for its object to furnish an improved attachment for reapers of that class in which the rakes act as beaters, in the place of a reel, and are made to descend occasionally to sweep the bundle from the platform, so that the third, fourth, sixth, or any other desired rake may sweep the platform and deliver the bundle.

SKY ROCKET.—John W. Hadfield, Newtown, N. Y.—This invention relates to a modification of an improvement in sky rockets for which letters patent were granted to this inventor bearing date Nov. 28, 1863. The original improvement consisted in a novel application of wings to the body or "carcass" of the rocket, whereby the use of the ordinary guide stick was rendered unnecessary and the rockets rendered capable of being packed for transportation much more compactly than when provided with sticks. The present invention also consists in a novel manner of attaching the wings to the body or "carcass" of the rocket, whereby the same advantage is obtained as hitherto, at a less cost of manufacture.

TAIL PIECE FOR VIOLINS.—James Thoms, South Boston, Mass.—This invention relates to a new and improved manner of attaching the E-string to the tail piece of a violin, whereby a comparatively small portion of said string is wasted in case of breakage.

HAME TUG.—James E. Covert, Townsendville, N. Y.—This hame tug, according to the present invention, is made of a strip of malleable iron or other suitable material, perforated or provided with V-shaped holes or slots having a center tongue piece, for the reception of a V-shaped block fixed at one end of the trace, by means of which block the trace is engaged with the hame tug, where through a suitably arranged spring slot that strikes against the end of the tongue to the said V-slots, the block is held firmly in place, and consequently the trace fastened to the hame tug.

CENTER BOARD.—F. J. McFarland, San Francisco, Cal.—This invention relates to the location of the center boards of boats and sailing craft of all kinds, but is designed more particularly for freight-carrying vessels. It consists simply in employing two center boards and locating the same at the extreme ends of the hull.

MUSICAL INSTRUMENT.—George W. Van Dusen, Williamsburgh, N. Y.—This invention consists in a novel connection and arrangement of levers and valves between the plane of movement of the perforated surface or surfaces, and an air chest or chests, and the keys or levers for opening the valves to the reeds or for operating any other mechanism suitable for producing tones, whereby through such perforated surface or surfaces the mechanism forming the connection between it and the sounding mechanism will be operated through the perforations to produce the sound or note or notes desired, of whatever length such notes or sounds are to be.

COMBINED SEAT AND DESK.—Rev. Allen H. Burn, May's Landing, N. J.—The present invention relates to the combination of a desk or lid with a seat or bench, such lid or desk being hinged to the back of the seat in such a manner as to be raised or lowered at pleasure, and when raised, supported in position by means of supporting bars properly applied thereto.

MACHINE FOR REFITTING CONICAL VALVES.—Charles F. Hall, Brooklyn, N. Y.—This invention relates to a device by which the conical stop valves of gas, steam, and water works may be refitted or repaired when from any cause they are rendered leaky and unfit for use.

GRAIN-BAND CUTTER AND FORK.—E. G. Bullis, Manchester, Iowa.—This invention has for its object to furnish an improved instrument by means of which the bands of the grain bundles may be cut at the same time that the bundles are pitched to the person who feeds them to the threshing machine, and by the same operation.

PROPELLING VESSELS, ETC.—Robert R. Spedden and Daniel F. Stafford, Astoria, Oregon.—This invention has for its object to furnish an improved means by which the motion of the waves may be used for propelling vessels or working pumps or other machinery.

MAILBAG FASTENER.—S. Denison, Portlandville, N. Y.—This invention has for its object to furnish an improved mailbag fastening by the use of which the mouth of the bag will be closed securely, and which may be operated, in closing and opening the bag, in less time and with less labor, than the fastenings now in use.

KNIFE AND FORK CLEANER.—John Merritt, New York city.—This invention has for its object to furnish an improved machine by means of which knives and forks may be quickly and thoroughly cleaned.

CHURN.—Thomas Bisbing, Buckstown, Penn.—This invention has for its object to furnish an improved churn conveniently and easily operated, and which will do its work quickly and thoroughly.

SAW BUCK.—Henry J. Dill, Cummington, Mass.—This invention relates to the manner in which a stick of fire wood, or cord wood, is held fast or secured in the saw buck for the purpose of sawing it into suitable lengths, and it consists in arranging adjustable toothed clamps for holding the stick, which clamps are brought in contact with it by bearing upon a treddle with the foot.

PLATFORM SCALES.—D. Hazzard, Milton, Del.—This invention relates to a new and improved method of constructing scales of the platform kind, and it consists in attaching a spiral spring to a spindle, to the top end of which spindle the platform is secured, and to the bottom end of which a rod and index finger is attached, so that when an article, to be weighed, is placed on the platform, the weight of the article will act upon the spring and be indicated by the finger.

WASHING MACHINE.—S. W. Curtiss, Sugar Grove, Pa.—This invention relates to a new and improved method of constructing washing machines, and consists in the arrangement of three fluted revolving rollers in a suitable washing box or vessel.

COMBINED TRY SQUARE AND BEVEL.—Samuel N. Batcheider, Prairie du Chien, Wis.—This invention consists in attaching the blade of a try square to the stock in such a manner that it can be set and fastened at any desired angle by operating a hook slide and set screws.

STEAM ENGINE.—J. F. Troxel, Bloomsville, Ohio.—This invention relates to a new and improved method of constructing steam engines, whereby the same are greatly increased in power and effectiveness, and consists in operating a number of pistons in one cylinder.

STOVE.—T. W. Wisner, Howell, Mich.—This invention relates to a new and improved method of constructing those stoves which are used for drying purposes, or for heating water, or steaming vegetables, and for all other purposes of a similar nature, and the invention consists in rendering the stove portable by providing for supporting the same on truck wheels, which allows of its being transported from place to place, as may be required.

FURNACE HOT-AIR BLAST.—Richard Long, Chillicothe, Ohio.—This invention relates to a new and improved method of constructing and arranging the air pipes for heating the air blast for furnaces for smelting and reducing the ores in the manufacture of iron, having particular reference to the materials of which the air pipe is formed, the method of its construction, and also to the materials and method of construction of the supporting walls.

PRINTING POINTERS.—R. W. Macgowan, New York city.—This invention relates to a new and improved application of pointers to printing presses for registering the sheets of paper as they are fed to the press. Hitherto these pointers have been operated automatically, from the running parts of the press, allowed to remain in an elevated or nearly upright position, and through the sheet until the fingers or nippers of the cylinder arrive in proper position to grasp the sheet, at which time the pointers are drawn down and the sheet released, so that it may be connected with the cylinder, and related with the same in order to receive the impression. This improvement consists in applying a spring or an equivalent weight to the pointers, the latter being pivoted at their lower ends, or attached to axes and all constructed and arranged in such a manner that the pointers will hold the sheets properly in position on the feed board, and the nippers of the cylinder allowed to draw the sheet off from the points on account of the latter yielding or being allowed to be drawn down under the slight pull of the sheet, the springs or weights throwing the points back to their original position as soon as the sheet is withdrawn.

CLEANER FOR LAMP CHIMNEYS, ETC.—R. B. Musson, Champaign, Ill.—This invention relates to an improved cleaner for lamp chimneys, bottles, and other hollow ware.

SAWYER'S RULE.—Thomas Carter, Louisville, Ky.—This invention relates to an improved sawyer's rule, and consists of a rule on which is a scale showing at a glance the number of boards or planks, of any desired thickness, which can be sawn from a log of any given diameter.

WINDOW SCREEN.—A. W. Griffith, Roxbury, Mass.—This invention relates to an improvement in window screens, and consists in a screen wound round a spring roller at foot of a window, and attached to the bottom of the lower sash so that on opening the window the screen opens with it, admitting the air but excluding insects, and on closing the sash the screen winds up itself.

SHOVEL PLOW, CULTIVATOR, ETC.—P. Atkinson Ross, Harveys, Pa.—This invention has for its object to improve the construction of single and double-shovel plows, cultivators, etc., to enable them to be readily adjusted for use upon sidehills or level ground, so that the handles may be secured in nearly a level position, while the plow is held in the best position for doing the work properly.

SKY ROCKETS.—John W. Hadfield, East Williamsburgh, N. Y.—This invention consists in dispensing with the long stick or guide which is now attached to sky rockets in order to insure a straight upward flight of the same in the air, and using instead a plurality of short guides, whereby several important advantages are obtained, to wit: the packing of the rockets in a small space, so as to economize in transportation, the forming of a stand or support for the rocket, so that no fixture of any kind will be required when they are to be fired or "set off," and lastly, the obtaining of an efficient guide to insure the straight flight of the rockets upward in the air.

CATCHING THE OXYDE OF ZINC.—G. C. Hall, Brooklyn, N. Y.—This invention relates to an improved means for catching the oxyde of zinc, as it escapes with the fumes and gases from roasting zinc, or zinc ore. Hitherto the oxyde of zinc has been caught and retained by forcing the fumes and gases from the roasting ore into a large bag or receptacle composed of cotton cloth or other porous material, which will admit of the gases and air passing it, but not the oxyde, the latter being retained within the bag, and, by its superior gravity, falling to the bottom thereof and settling in teats or pendent receptacles at the bottom of the bag, from which it is removed from time to time. This invention has for its object the dispensing with the large bag, which is very expensive—the gases from the ore affecting the same so that it rots in a very short time, and soon becomes ruptured under the blows which are given it to cause the oxyde which adheres to the sides of the bag to drop into the teats or receptacles made to receive it. The invention consists in having the fumes and gases from the roasting zinc or zinc ore forced into a close building, provided with openings or apertures, over which screens are placed, constructed in such a manner and of such materials as to admit of the air and gases passing through them, but not the oxyde.

FERRULE.—Archibald Shaw, Philadelphia, Pa.—This invention relates to a new and improved ferrule, for the handles of tools and other implements, and it consists in providing the interior of the ferrule with oblique spurs or projections, disposed or arranged in such a manner as to admit of the ferrule being driven on the handle and at the same time prevent it from casually slipping off therefrom. The object of the invention is to obviate the necessity of tacks or screws being used to secure the ferrule on the handle, as well as the pinching of the same externally to form a burr to sink into the handle to effect the same end.

SUCTION OR VACUUM PUMP AND BLOWER.—John Doyle and Timothy A. Martin, New York City.—This invention consists in arranging valves and air passages with a hollow cylinder or drum, having an oscillating movement, and provided with a chamber or chambers to receive water, mercury or other fluid, whereby an exceedingly simple and compact pump or blower is obtained, one not liable to get out of repair or become deranged by use.

MACHINE FOR REGISTERING NUMBERS FOR ODOMETERS.—Henry F. Hart, New York city.—This invention relates to an improved machine or apparatus for registering numbers applicable to odometers or measurements of quantities of all kinds, such as the numbers of barrels of flour, bushels of grain or any other commodity that requires a tally or record of the quantity packed, stored, weighed, or handled in any manner.

DITCHING MACHINE.—A. H. and P. S. Whitacre, Morrow, Ohio.—This invention relates to an improvement in the construction of a machine for cutting ditches suitable for laying tile for draining lands, or pipe of any kind, and consists in a sled worked by tackle and supporting a frame carrying the machinery, in such manner that the frame can be raised and lowered to cut the ditch to any required depth.

WINDOW SHADE RACK AND PULLEY FASTENING.—Wm. H. Woods, Philadelphia, Pa.—This invention relates to an improvement in constructing a fastening for window shades and consists in a metal rack to be attached vertically as usual to the side of the window frame for holding the cord connected with the shade by means of a lever dog that works in a longitudinal slot in the rack and is engaged and disengaged with the teeth thereof by moving the lever in and out of the slot to be secured in places when engaged by a swivel knob on which is a pulley that covers the cord of the shade.

FENCE POST.—Warren H. Shay, Sylvania, Ohio.—This invention relates to an improved method of constructing fence posts and consists in forming them of plank uprights supported by braces and held together by cross ties and keys.

CLOTHES-WASHING MACHINE.—John D. Swartz, Milton, Pa.—This invention relates to a new and improved clothes-washing machine of that class which are provided with an oscillating rubber and a concave of rollers.

RAILROAD RAILS AND CHAIRS.—John H. Downing, Salem, Mass.—This invention relates to an improvement in railroad rails and chairs, and consists in forming the rails in two parts, to lie side by side, with lap-joints combined with narrow chairs, having single heads placed on each side of the rail to clamp the two parts together at the joints, and fasten them to the ties.

MACHINE FOR STRETCHING CLOTH.—A. C. Corpe, Stafford, Conn.—This invention relates to a new and improved machine for stretching cloth, with a view of rendering the same smooth and enfolding such portion of the selvedges which may have been rolled over in the manipulations to which it was subjected after being taken from the loom.

MACHINE FOR SHARPENING SAWS.—E. B. Rich, South Boston, Mass.—This invention relates to a machine for the sharpening of saw blades, whether straight or circular, and consists in the combination of a revolving or rotating grinding wheel, made of any suitable material, and a holder for the saw-blade, so arranged together that as the grinding wheel revolves the saw will be presented to the same, or the wheel to the saw-blade, in such a manner as to produce the desired sharpening of the teeth, in regular order and succession.

DOOR SPRING.—Rudolph Schrader, Indianapolis, Ind.—The present invention relates to a spring for doors, that being properly connected with the door will operate to close, whether when opened it swings inside or outside through the casing to the door, the spring being especially applicable to doors hung to swing through their casing, or inside and outside.

PORTABLE DERRICK.—D. J. McDonald, Gold Hill, Nevada.—This invention relates to a new and improved derrick, and it consists in a novel construction and arrangement of parts, whereby the device may be readily drawn from place to place, the crane or derrick frame adjusted in any desired position within the scope of its movement, friction avoided, and the whole apparatus manipulated with the greatest facility.

Answers to Correspondents.

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

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

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

J. F. McK., of Md.—"What kind of silk is used for balloons, what is the varnish which covers them, and what amount of common illuminating gas will support one pound weight?" Silk for large balloons is now rarely used, stout cotton cloth being substituted. Ordinary boiled linseed oil makes a good varnish. Any elastic varnish will do, however. The specific gravity of ordinary illuminating gas ranges from 0·540 to 0·700, air being 1·000. Its weight may be called one-thirty-second of a pound to the cubic foot and atmospheric air about three-fourths of a pound.

R. B. C., of Pa., says: "Here is a proposition in geometry which I would like to see demonstrated theoretically by one of your correspondents. The side of a regular heptagon is equal to half the side of an equilateral triangle inscribed in the same circle. The mechanical construction is very simple and will be found useful. I discovered it some years ago, and am not aware of its ever having been in print."

F. H., of Mich., asks "if sal-soda will scale a boiler?" H. N. Winans, 11 Wall street, N. Y., replies that in some waters it is partially effective but at the expense of the boiler, with a certainty of foaming and corrosion. The most reliable and positively uninjurious remedy for incrustations is his anti-incrustation powder—in successful use for 12 years past.

T., of R. I., speaks of the famous mechanical horse shown at the Paris Exposition which is said to have accomplished with its rider a little over an English mile in fifty seconds, and asks what is the motive power. As it is said that the French Government took possession of the machine and preserves its mechanical construction a secret, we know no more about it than about the much vaunted Napoleon cannon.

S. S., of N. Y.—"Please give the ingredients of the composition used for tipping matches." Different manufacturers employ different materials and in varying proportions; the mixture of phosphorus melted and stirred up with thin glue is sufficient, although some add a quantity of powdered glass, niter, chlorate of potash, sulphur, etc. The phosphorus, however is the light-producing material.

R. S. B., of N. Y., alluding to the inquiry of S. W. P., in No. 25, for a water-proof paste: "Calico printers when they wish to leave white figures on a dark ground use what they term a 'resist paste' to cover such places as are designed to be unaffected by the dye. If the ingredients of this paste were known it might be what S. W. P., desires." This "resist paste" is 1 lb. of binacetate of copper (distilled verdigris), 3 lbs. sulphate of copper dissolved in 1 gal. water. This solution to be thickened with 2 lbs. gum senegal, 1 lb. British gum and 4 lbs. pipe clay; adding afterward, 2 oz. nitrate of copper as a deliquescent.

M. A. H., of Vt.—"I have a surplus of water power and desire to know the probable cost of the apparatus for producing the electric light, with a view of employing my surplus power in that direction.' A serviceable magneto-electrical machine for giving light is quite expensive.

Business and Personal.

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

MANUFACTURING, MINING, AND RAILROAD ITEMS.

For the benefit of the Union Pacific railroad, the base of the Rocky Mountains has been fixed at the base of the Black Hills, a distance of 6·677 miles west of Cheyenne, and, according to the railway surveys 525·078 miles from Omaha.

The Pittsburg, Fort Wayne and Chicago railway have just re-built in the most permanent manner an iron bridge over the Alleghany river, to replace the old wooden Howe truss bridge, which had become inadequate to the increasing traffic. The new bridge opens like a fan towards the freight yard at Pittsburg being at the narrowest part, next to the main span 55 feet wide. The river is crossed with spans averaging 153½ feet in the clear, with a bearing of five feet on each pier. The principle of the construction is known as the lattice girder plan, with vertical stiffening. The work was executed under the superintendence of its designer, the engineer and architect of the company Felician Stataper.

The production of precious metals in the United States from 1849 to 1867 inclusive, has amounted in value to $1,174,000,000.

The president of one of the New Jersey railroads proposes a plan to avoid the danger to life and limb from the series of trains that run into and out of Jersey city. The new project is to elevate the present tracks fifteen feet above the streets, and by safe machinery to lower at once an entire train in the depot at the river.

A mining company at Newton, Nev., are making preparations to work their claims by means of a steam engine which will be used to throw a stream of water instead of the ordinary hydraulic pressure. They estimate that with a ten or twelve horse power engine, they can throw 100 inches of water with a force equal to at least 150 feet fall. The result of this experiment is looked upon with a good deal of interest, as there is a vast amount of good hydraulic ground in the adjoining countries, which, as in this case, cannot be worked by the ordinary process for want of water fall, but which, if the expedient in this case proves successful, will soon be worked by steam engines.

By an oversight in the article on the trans-continental railroad, published in our last issue, the Western or California section of the road was styled the Union Pacific, instead of the Central railroad. In the race to reach Salt Lake the California company have 400 miles more to build, while the Union company have only 328 miles. But the country to be traversed by the former is comparatively level, and favorable for winter work, while that on the other side crosses four distinct mountain ranges, and winter storms must interrupt work for several months in the year.

PATENT OFFICE DECISIONS ON APPEAL.

USEFUL COMPOUNDS ARE PATENTABLE—THE APPLICANT NOT REQUIRED TO PROVE THE FUNCTION OF EACH INGREDIENT.

S. H. HODGES for the Board of Examiners-in Chief.

Application of Rew for a Patent for Preventing and Curing Swine Cholera.—The applicant's specific is composed of a number of medical articles, the nature of which is not important upon the present occasion, and it is unnecessary to enumerate them. But it is objected that "a medical prescription" "should contain some recognition of the medicinal properties of the several ingredients" "and the part they perform in the compound;" or, as it is elsewhere expressed, such a mixture should not receive the sanction of this department "unless perhaps a satisfactory rationale should be given for the use of each of the ingredients in the proportions named."

If the medical faculty were always satisfied themselves as to the operation of the various remedies they employ, there might be more reason in the objection. But it is well known that different schools disagree widely on this subject, and there are remedies employed with success the effect of which the most intelligent are unable to account for. So long as there is a single one of this character to be found, and while the operations of the vital functions are so concealed from us that we are unable fully to comprehend the process by which any specific operates, so long it is impossible to prescribe as a condition of patentability, a full explanation of the mode in which any one acts that is brought forward. It would be still less justifiable to require such an explanation as would content any particular class of medical men. Every year new therapeutics are introduced into practice, and not unfrequently some whose beneficial results are not understood. And as long as one such may be found, it is not just to make it a condition of its being protected by a patent, that the discoverer should bring the scientific world to agree with him in his theory respecting it, nor even that he should have one.

The man who stumbles upon a new and useful article is just as much entitled to the exclusive use of it as if he had elaborated it by the most profound and painful study. It is true that there is danger upon this principle of countenancing mere nostrums, and giving them undue prestige. This can only be guarded against by the exercise of great caution, and requiring convincing proof of utility. Such has been furnished in this case, in abundance.

The application cannot be rejected except upon such grounds as would insure the rejection of nearly all medicines whatever. Nor is the Office responsible for the false importance which the public may attach to its proceedings, so long as they are confined to its legitimate province. Its duties certainly must not be neglected, and meritorious petitions refused, in order to obviate such misapprehensions.

The decision of the Primary Examiner is reversed.

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