admit of easily transforming engines such as those used for agricultural and other purposes, by the addition of plate board and tender, into small locomotives capable of running on public roads or streets, for moving every kind of vehicle, for ascending mountains however steep, for working agricultural and other implements, and for other purposes.

APPARATUS FOR HEATING STEAM BOILERS.

This invention consists in communicating the heat to the boiler for raising steam through the medium of a substance which is fluid at the working temperature, but which does not readily evaporate or become decomposed, while it is capable of supplying the necessary heat without being so hot as to injure the boiler shell. Lead is a suitable and convenient substance for the purpose in view, and in carrying out the invention the patentee applies that substance between the fire and the boiler proper, putting it in a bath jacket or shell of a form adapted to whatever class of boiler may be used.

## A CURIOUS CLOCK.

Some time since there was exhibited at a watchmaker's window in Montgomery street, in San Francisco, a clock, in which, at first sight, there seemed no possible means of making the hand revolve. The dial was a simple plate of transparent glass with a small, smooth pin in the center, which passed through a plain hole in the hand. The clock had but one hand—an hour hand light and slender—and upon the short end of this was formed a small box of thin metal. There was no contact of the hand with the dial except at the pivot, and there was nothing touching the pivot except the hand and the glass in which it was embedded, yet the piece kept perfect time. This clock was a mechanical puzzle that attracted a constant group around the window.

We have never received any explanation of the construction of this puzzle, but imagine that the works were in the small box on the short end of the hand. Suppose within this box watch-work driven by a spring and regulated by a balance wheel, so that it would cause a little hand to revolve once in twelve hours, in a plane parallel with the dial. Then let this little hand carry a small weight say a pistol bullet on its end, and let the large hand be made very light, and be so nicely poised that when the weight was furthest from the fulcrum, it would bring the short end of the large hand down, causing the long end to point directly upward and indicate 12 o'clock; but when the weight was nearest the fulcrum the long end would overbalance and point downward to 6 o'clock. Then as the weight revolved it would cause the hand to balance in the several positions around the dial, depending upon the time of day as kept by the watch-work within the box.

If this explanation is correct, the hand might be laid away in a drawer, and on taking it out at any time and slipping it upon the pivot, it would swing to the exact hour of the day.

### Device to Prevent Candles from Guttering.

An English journal thus remarks of a new invention for preventing candles from guttering:—

"Many contrivances have been brought out at one time or another to prevent candles from guttering when being carried about or standing in a draught.

"For the information of the trade, we may say that this article is nicely finished in polished brass and glass and is retailed at the small price of one shilling English money. It most effectually prevents the candle from guttering; while the brilliancy of the flame does not suffer from want of air, a good supply of which is secured by perforations in the lower extremity of the Nozzolette; while the protector is kept free from grease by an occasional dip in scalding water, the candlestick requires less trouble to clean it then when the grease is allowed to run into the crevices."

THE entire length of the railroad between Vera Cruz and Mexico will be 315 miles; the highest summit level, 8,300 feet above the sea, being double the hight of any other railroad in the world; it will have an incline of 23 miles, and a grade of 212 feet per mile, on which the curves have a radius of 500 feet. There is one bridge to be built 290 feet high, beside several tunnels, etc.


ISSUED FROM THE UNITED STATES PATENT-OFFICE FOR THE WEEK ENDING MAY 16, 1865.

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☞ 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.

**47,688.—Metallic Cartridge.—Ethan Allen, Worcester, Mass.:**

I claim, First, Making the base of the cartridge shell with an opening and a flange, b, in combination with grooving out the base, B, whereby the body of the cap, as well as the flange which contains the fulminating powder, are well supported, and a sure explosion insured, substantially as described.

Second, The combination with the case, A, of a base, B, provided with three flanges, a b and c.

**47,689.—Making Sheet-metal Boxes.—George Anderson, Salem, Oregon:**

I claim the mold, A, in combination with the form, C, the latter being composed of the plates, a f f g g, connected by hinges, e h, and the mold being attached to the plate, a, of C, by a hinge, B, all arranged substantially as and for the purpose set forth.

Second, I also claim the spring, D, in the described combination, with the hinged block, A, for raising the same automatically, as explained.

Third, I further claim the arms, k k, in the described combination, with the hinged plates, F F, for the purpose specified.

[This invention relates to a new and improved machine for constructing or forming the bodies of sheet-metal boxes, whereby the work may be done rapidly and in perfect manner.]

**47,690.—Snap Hook.—Jonathan Bailey, East Troy, Wis.:**

I claim the combination of the sliding bolt with the snap hook and spiral spring coiled around the bolt, as described, for the purposes set forth.

**47,691.—Harvester.—Stephen S. Bartlett, Providence, R. I.:**

I claim the combination with the shoe, D, of the pivoted spring brace, E, fixed spring brace, G, lever, H, and rack, f, all arranged in relation to the main frame, as and for the purposes described.

**47,692.—Mowing Machine.—Stephen S. Bartlett, Providence, R. I.:**

I claim the use of the socket, f, cast with the pole plate, in combination with the adjustable standard, K, for supporting and adjusting the seat, substantially as herein described.

**47,693.—Cultivator.—Wm. E. Bates, Elmore, Ill.:**

I claim the swinging levers, Q Q, connected substantially as described, with the forward and rear shovel standards, which are pivoted in such relation to the frame and laterally-moving mechanism that the two shovels thus connected are caused by the action of the treadle to approach to or recede from the corn in concert, as described and represented.

**47,694.—Ventilation of Mines.—J. Lowden Beadle, Ashland, Pa.:**

I claim the use of the fan as an exhauster of the impurities of mines, or for the purpose of creating a partial vacuum in the working parts thereof, in combination with the system of air courses herein represented and described.

**47,695.—Crutch.—August Bickel, Philadelphia, Pa.:**

I claim the employment of a removable buffer, D, in combination with the spur, B, fixed rigidly in the lower part of the crutch staff, A, as described, the said buffer being constructed so as to be applicable over the spur, in the manner described and for the purpose specified.

I also claim the employment of the removable guard thimble, C, in combination with the spur socket, E, on the lower end of the crutch staff, A, as described, the same being constructed so as to be applicable, in the manner and for the purpose set forth.

**47,696.—Constructing Boots and Shoes.—Lyman R. Blake, Boston, Mass.:**

I laim the new process of constructing a shoe, substantially as set forth.

**47,697.—Machine for Measuring and Counting Shingles.—M. Bonney, Mantua, Ohio:**

I claim as my improvement the measuring wheel, F, and recording index, I K, in combination with the slide, G, hooks m, and c c, dog, g, and adjustable arms, D D, arranged and operating as and for the purpose set forth.

**47,698.—Clothes Dryer.—Edward Bucklin, Jr., Pawtucket, R. I.:**

I claim the longitudinally sliding rod, E, forming the guide for the revolving slave or swivel, D, in combination with folding arms, C, hinged braces, b, ring, B, and post, A, constructed and operating substantially as and for the purpose set forth.

**47,699.—Cultivator.—James Brewer, Albany, N. Y.:**

First, I claim securing the central pair of cultivator standards to the plow beams by means of swivel hinges, for the purpose of admitting them to be moved in a vertical as well as in a lateral direction, substantially as and for the purpose specified.

Second, In combination with the laterally movable standards, O, adjustable stirrups, r, substantially as and for the purposes specified.

Third, In combination with the laterally movable standards, O, the extension pieces, p, and knee stirrups, s, for the purpose of enabling the plowman to operate the plows by hand or foot, substantially as and for the purpose specified.

**47,700.—Railroad Car Brake.—Ferdinand E. Canda, Chicago, Ill.:**

First, I claim the belt, a, when used for distributing the pressure on the wheel, b.

Second, The combination of the eccentric wheel or cam, b, and the belt, a, with the connecting rod or chain, c.

Third, The arrangement of the shaft, m, eccentric wheel or cam, b, belt, a, and the ratchet and pal, l and h, all being arranged and operating substantially as set forth and specified.

**47,701.—Device for Heating and Conveying Petroleum.—Joseph Casey, Washington, D. C.:**

First, I claim the combination of steam generators, tanks, the conduit pipes and the steam pipe, and their various connections, for conveying the oil or petroleum from the wells to the receiving, gaging and heating tank, for raising it there to the proper temperature, and from thence conveying it to any required distance in the conduit pipes into other tanks, and maintaining its temperature while passing through the same, by means of the small steam pipe and its connection with the generators.

Second, I claim also the arrangement of the small steam pipe or tube within the conduit pipe, whereby the introduction of steam into the small pipe will apply and communicate such an amount of heat directly to the oil, petroleum or other substance in its flow and passage through the conduit pipe as will keep it in a fluid and flowing state, and prevent the deposit and accumulation of the sediment or residuum of the oil or petroleum in the conduit pipes, it being held in solution by and carried off with the petroleum.

**47,702.—Guard Fingers for Harvesters.—Salem Coeland, Worcester, Mass.:**

First, I claim coring out the rear of the guard finger, in combination with fastening the steel plate by a short rivet to secure lightness and greater uniformity in the metal thickness of the guard, in the manner herein described.

Second, Coring out the rear of the guard finger, in combination with supporting the bridge, g, by an inclined brace, h, substantially as and for the purposes described.

**47,703.—Horse Hay-rake.—J. Crellin, Marshalltown, Iowa:**

First, I claim the constructing of the teeth of two longitudinal parts, a a, attached to opposite sides of the rake head, A, and connected at their ends by metal tips, b, substantially as described.

Second, The oblique braces, C, attached to the draught bars, D, and arranged to rest or bear upon the cylindrical portions, c, of the rake-head, A, as set forth.

Third, The arrangement and combination of the frame, I, pivoted to the outer part of the bars, E E, and the pendant frame, G, the two frames aforesaid being connected by a rod, H, and the frame, G, connected by springs, b b, with the bars, E E, substantially as and for the purpose set forth.

[This invention relates to a new and improved horse hay-rake, and it consists in a peculiar construction of the teeth, an improvement in the draught pieces, and also in the mechanism employed for holding the rake in working position and liberating the same, in order that it may discharge its load, whereby it is believed that several advantages are obtained over the generality of rakes now in use.]

**47,704.—Machine for Making Clasps from Sheet Metal.—John H. Doolittle, Ansonia, Conn.:**

I claim the combination of two or more sets of rotary dies, to cut out and form the blanks, when constructed, arranged and operating substantially as described.

I also claim making the sets of dies adjustable, substantially as described, for the purpose of registering differently and adapting the machine to different kinds of work, as hereinbefore described.

I also claim making one or both sets of the above described dies adjustable in the direction of their axes, substantially as described, for the purpose of setting the dies in line, one set with another, as set forth.

I also claim the employment, in combination with the female die, b, of a sustaining and disengaging guide plate, W2, as its equivalent, substantially as and for the purposes set forth.

I also claim, in combination with the rotary dies, c d, the series of clearing figures, 4 5 6, the whole arranged and operating as specified, for the purpose set forth.

I also claim, in combination with the cutting-out dies, a b, the cleaver and chute, h, and deflector, i, arranged to operate substantially as set forth.

**47,705.—Siphon Bottle.—G. W. Doty, Ravenna, Ohio:**

I claim the tubes, B and D, in combination with the tube, E, and bottle, when connected and arranged substantially as described.

**47,706.—Heating and Cooking Range.—Eben Edwards, Boston, Mass.:**

I claim the above-described arrangement of the lateral conduits, M M, the radiating drum, K, the air-heating chamber, P, the fireplace, A, the smoke chamber, R, the oven and its flue space, G, connected with the fireplace and the radiator, as specified.

I also claim the combination of the tubes, V W, leading out of one end of the fireplace and through the air chamber with the grate shaft, the fireplace and the journal bearings, x x, at the opposite end of the fireplace, the whole being substantially as specified.

**47,707.—Cylinder Pin of Revolving Fire-arm.—Wm. H. Elliot, Plattsburgh, N. Y.:**

First, I claim locking the cylinder into the frame by turning the base pin upon its axis, substantially as set forth.

Second, Providing a base pin, which locks the cylinder by being turned upon its axis, with a catch, d, to prevent it from being turned back by accident, substantially as described.

**47,708.—Mangle.—Thos. Farnsworth, Cleveland, Ohio:**

I claim, First, The arrangement of the hanger, J, and rollers, A B, in combination with the spring, m, screws, d, and gearing, G H, substantially as and for the purpose specified.

Second, I claim the springs, P, and rollers, k, in combination with the tables, O P, and apron, R, when arranged and operating in the manner and for the purpose described.

**47,709.—Sash Supporter.—William C. Fisher, Charlestown Mass.:**

I claim the levers, D, and notches, d, operating substantially as described for the purpose set forth.

I also claim the presser blocks, e, when used as an adjunct to the levers, D, operating substantially as described for the purpose specified.

**47,710.—Corn Huskers.—E. F. French, New York City:**

I claim the employment or use of the plates or scrapers, G, in connection with the rollers, F F, arranged and applied to operate substantially as and for the purpose herein set forth.

[This invention relates to a new and improved machine for husking corn of that class in which rollers are employed to effect the object. In the original machine of this kind the corn husks are liable to wind around the rollers while the latter are stripping the husks from the ears, and thus render the machine very inefficient—a difficulty which is fully obviated by this improvement.]

**47,711.—Shutter Fastening.—Jacob Frick, Philadelphia, Pa.:**

I claim the plate, B, its arm, D, spindle, E, its head, g, and inclined shoulders, x x, in combination with the plate, A, and its slot, X, the whole being arranged, operated and adapted to shutters, substantially as and for the purpose herein set forth.

**47,712.—Revolving Fire-arm.—George H. Gardner, New York City:**

I claim, First, The employment or use of two or more cylinders presented in the same direction, one behind the other, and arranged in combination with one and the same hammer, substantially as and for the purpose set forth.

Second, The slide, I, applied in combination with the two cylinders, C C', and hammer, H, constructed and operating substantially as and for the purpose described.

Third, The spring catch, k, applied in combination with the two cylinders, C C', and slide, I, substantially as and for the purpose specified.

Fourth, Firing the charges of the rear cylinder through the front cylinder, substantially as herein specified.

Fifth, The grooved headed button, j', of the slide, I, constructed and adapted to operate as a sight, as herein explained.

**47,713.—Cooking and Heating Stove.—Milton Gilmore, Morning Sun, Iowa:**

I claim, First, The flues leading from fire pot, F, around ovens, O O, and between the plates forming the sides and top of the hood, to exit pipe, in connection with dampers, h h and p p, in the manner and for the purpose set forth.

Second, I claim the manner in which the fire pot is placed with grate and pit, as described.

Third, I claim the combination and arrangement with fire pot, F, of apertures, 2 and 4, and dampers, p p, substantially in the manner and for the purpose described.

Fourth, The hood of the stove constructed and arranged with the flues wholly extending around side and top, in connection with the dampers, h h, substantially in the manner and for the purposes described.

Fifth, The apertures, A', in the top of a stove, with side and top flues, and an illuminated sliding shield, D' D', in combination with the fire pot, F, in the manner and for the purpose set forth and described.

**47,714.—Centrifugal Draining Machine.—Alexander N. Glass and Henry W. Bartol, Philadelphia, Pa.:**

We claim, in centrifugal draining or drying machines, the thickening of the primeter of the bottom plate of the revolving cylinder, and forming a groove, recess, or shoulder therein, so that the bottom of the wire gauze cylinder may rest therein, and below the surface over which the instrument is moved in scooping out the sugar, by which means it is protected from injury, substantially as herein described.