2 Sheets—Sheet 1.

A. J. ROBERTS.

MACHINE FOR MAKING HORSESHOES.

No. 47,071. Patented Mar. 28, 1865.

Fig. 4.

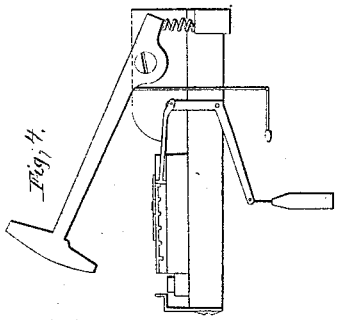
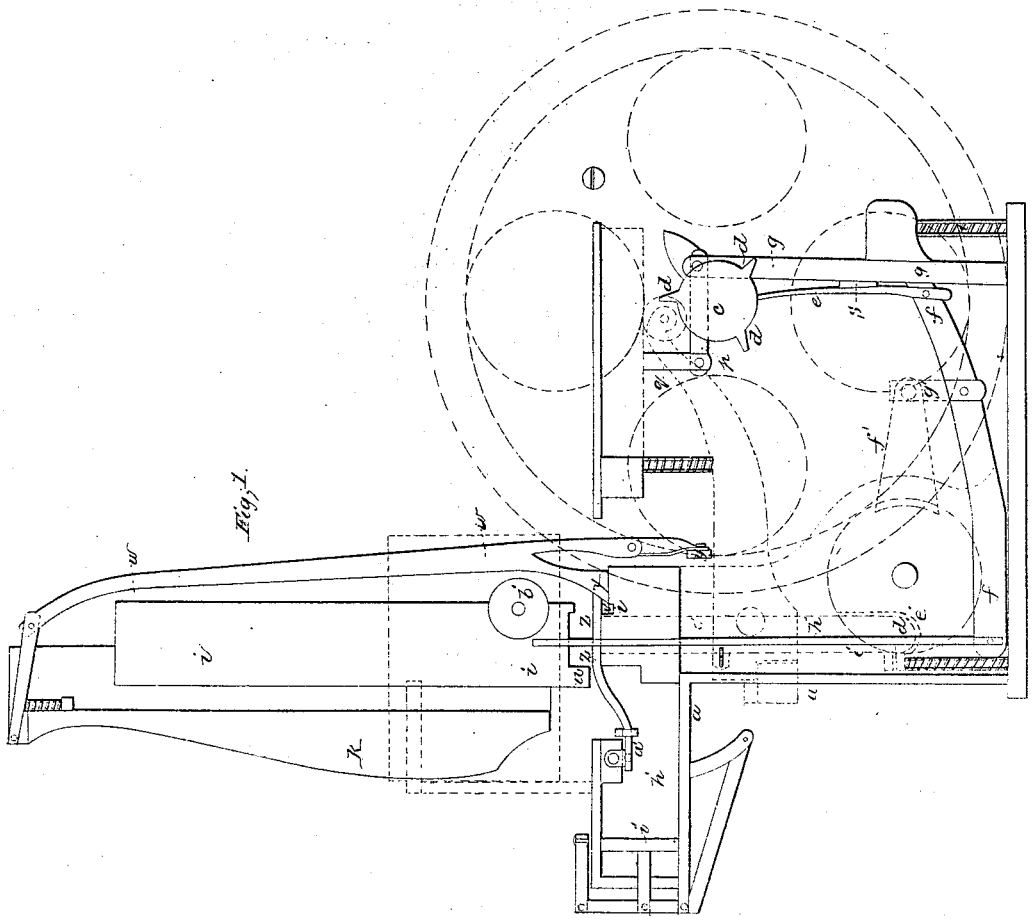


Fig. 1.



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Albert H. Brown

Inventor,
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2 Sheets—Sheet 2

A. J. ROBERTS.

MACHINE FOR MAKING HORSESHOES.

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Fig. 3.

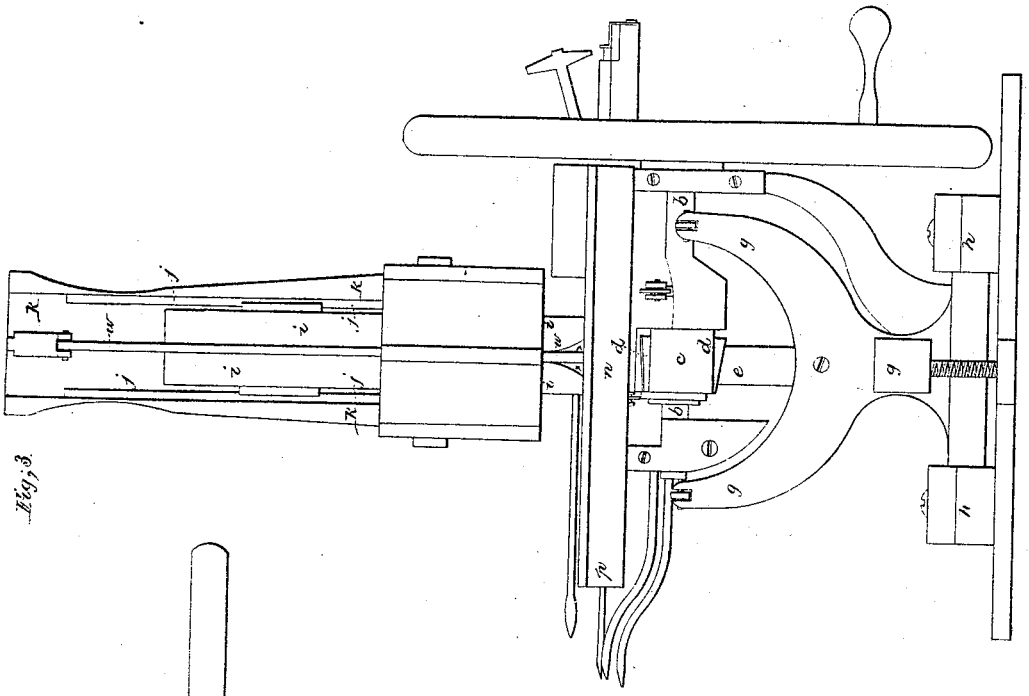
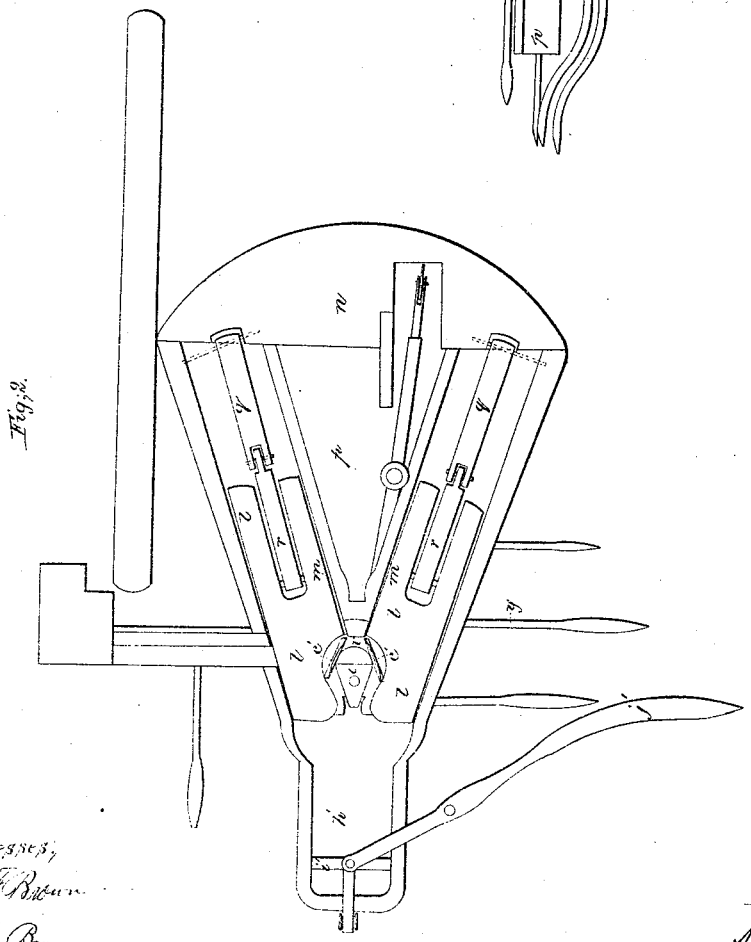


Fig. 2.



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UNITED STATES PATENT OFFICE.

ANDREW J. ROBERTS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO BENJAMIN F. BROWN.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOES.

Specification forming part of Letters Patent No. **47,071**, dated March 28, 1865; antedated March 13, 1865.

To all whom it may concern:

Be it known that I, ANDREW J. ROBERTS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Horseshoes; and I do hereby declare that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements whereby my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to secure by Letters Patent.

The present invention relates to certain new and useful improvements in machines for making horseshoes, the principal features of which consists, first, in a peculiar arrangement of horizontal sliding formers or benders, in combination with a stationary mold-block of the shape of the shoe, the said formers being arranged at an acute angle to each other with the apex toward the mold-block, and so operated by means of a suitable arrangement of mechanical devices in a forward direction as to press and bend the metallic bar of which the shoe is to be made around the mold-block and also narrow its points as desired; second, the use of a heavy drop-hammer moving in a vertical plane, and so arranged and connected with the driving-shaft of the machine that after having been raised to the desired height it is then left free to fall with its full force upon the shoe to hammer the same as desired; third, in the use of suitable punches for grooving the under side of the shoe, arranged and operated in a vertical plane and raised and lowered at the proper times by means of a peculiar arrangement of mechanical devices to be hereinafter described; fourth, in a new arrangement of devices for flooding the shoe with water for cooling the same, previous to taking it from the machine.

I have also made other improvements in the arrangement of mechanical devices composing the present invention which are quite essential to its perfect operation, and which I will hereinafter particularly specify.

In the accompanying plate of drawings my improvements are represented. Figure 1 is a central longitudinal vertical section; Fig. 2, a plan or top view with a portion removed; Fig. 3, an end view and Fig. 4 a detail view.

a a in the accompanying drawings represent the frame work of the machine; *b b*, driving shaft, revolved in any proper manner. On shaft *b* is a drum, *c*, having upon its periphery a series of projections, *d d*, &c., at equal distances apart, and of which there may be any desired number, which, as their drum *c* revolves, successively engage with the upper end of the vertical lever-bar *e*, the lower end of which is hung on a pivot of the bar *f*, placed horizontally, or nearly so, in the lower portion of the machine. The bar *f* is securely fastened at one end to a vertical swinging frame, *g*, turning in bearings *h h*, and to the other is attached by a pivot-joint the lower end of the vertical rod *h''*, secured at its upper in the vertical drop-hammer *i*, moving on vertical guides *j j* of the upright standard or post *k k l l*, benders or formers placed and traveling in suitable ways, *m m*, of the platform *n* of the machine at an acute angle to each other and to the stationary mold-block *o*, with the apex toward the same, said mold-block being of the form of a shoe and placed in the machine in the same vertical plane with the line of travel of the hammer *i*. These benders have their inner ends cut away, as seen in Fig. 2, corresponding to the mold-block, and are respectively attached through a series of connecting-rods, *p*, *q*, and *r*, to the upper end of the vertical frame *g*.

As the driving-shaft revolves, the projections of its drum successively abut against the vertical lever *e*, moving it back toward the frame *g*, between which and the said lever is inserted a rubber or other suitable elastic cushion, *s*, to prevent sudden strains, &c., which frame is thereby caused to turn in its bearings, withdrawing the benders from around the mold-block and raising the hammer *i* from the mold-block to the desired height by means of the connecting devices hereinbefore described. The projection and lever being then disengaged from each other, the frame *g* is suddenly and forcibly thrown back to its original position by means of the powerful com-

pressed spring *t*, thereby causing the benders to be quickly moved and with great force toward the mold-block, bending and pressing the straight metallic bar previously inserted in the machine and held there, as will be presently described, around the mold block, thus forming it into the desired shape. At the same time that the benders are thus made to bend the bar the hammer *i* commences to descend, it being left free to move by the disengagement of the drum and lever, as described, and finally falls with great force upon the top of the shoe for the purpose of hammering the same.

It is apparent from the above that the metallic bar or shoes receive a nearly simultaneous blow on its side and top, first from the benders and then from the hammer, instantly forming and hammering the bar into the shape of a perfect shoe—a result never before accomplished in machinery for making horseshoes, and the advantages of which are evident and need no particular mention here.

It may be also here remarked that by the connection between the hammer and frame *g*, as described, the power of the blow from the benders on the side of the shoe is greatly augmented, as the falling of the hammer thereby also serves to send them forward as well as the spring *t*.

In the described arrangement of the benders, when they nearly reach the limit of their forward movement, the space between the mold-block and the formers being there slightly narrowed, a greater compressing and hammering of the points of the bar nscessarily take places, which thereby narrow the same as desired. On the lower surface of the hammer is a lip or projection, *u*, so arranged thereon as to strike the two ends of the bar or shoe as the hammer falls and bend them down sufficiently to form calks.

For inserting the straight metallic bar in the machine to form it into a shoe, a groove, *v*, is made in the platform *n*, bringing each end of the bar in the line of play of the benders; and to firmly hold the bar there, while being bent around the mold-block, a vertical bar, *w*, hung in the top of the post *k*, and having a projecting piece, *x*, which rests upon the metallic bar at its center, and is made to tightly bear upon the same when desired by a lever-rod, *y*, attached to the lower end of the bar *w*, or by means of any suitably-arranged treadle. Plates *z z* are also arranged upon each side of the mold-block to cover the bar as it is formed around the block, and thereby more fully prevent all liability of its being sprung out of the machine, joined together at *a*, and swung open by the lip *u* of the hammer in its downward movement, the friction-wheel *b'* in said hammer throwing off the holding-bar *w*, thus leaving at the proper time the whole top surface of the shoe exposed to the desired action of the hammer thereon.

c' c' are two vertical punches or creasers arranged on opposite sides of the mold-block in suitable ways below the top of the same, and resting at their lower ends, *d' d'*, on the block or wheel *e'*, connected to the bar *f* by projecting arms *f' f'* and rods *g' g'*, whereby, as the bar *f* is depressed by the backward action of the frame *g*, the block *e'* is sufficiently revolved in its bearings to raise the two punches *c' c'* to the desired height and bring them in proper position to act against the under side of the shoe and crease the same as it receives the blow from the drop-hammer on its upper side. The opposite movement of the frame *g* necessarily withdraws the punches *c' c'* as is evident without further explanation.

The shoe, after being formed and creased as above described, I then cause to be flowed with water or other suitable liquid, to cool the same, from the reservoir *h*, made around the mold-block, by means of a piston or plunger, *i'*, connected with a lever-bar, *j'*, by the proper movement of which the piston is made to flow the water over the shoe. The shoe can then be removed from the machine and another bar inserted, when the same movements take place as before specified.

Previous, however, to inserting the bar in the machine I cause a calk to be inserted in the middle of the same, which, after the bar is bent into a shoe, is called its "front calk." By means of a series of mechanical devices which I have attached to the model, and are represented in Fig. 4 of the accompanying drawings, and for the arrangement and operation of which, together with that of a peculiar-shaped knife or cutting device, also represented in the accompanying drawings, I intend to make separate application for Letters Patent.

To receive the center calk inverted in the bar, a proper-shaped hole, *l'*, is made in the anvil-block, so that the bar when placed in the machine shall be perfectly level.

Having thus described my improvements, I shall state my claims as follows:

What I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. The use of the heavy drop-hammer *i* for hammering the top of the shoe, arranged and operated by means of the devices hereinabove described.

2. Holding, covering, and uncovering the shoe for the purpose specified by means of the projecting piece *x* of vertical bar *w* and plates *z z*, arranged together and operated by the downward movement of the hammer *i*, substantially as herein described.

3. Flooding the shoe with cooling liquid before taking it from the machine, substantially in the manner and by the devices described, the same consisting in surrounding the mold-block with the reservoir *h'* filled or nearly

filled with water or other suitable cooling-liquid, which liquid is flowed at the proper times upon the shoe by means of the plunger i', c arranged and operated substantially as described.

4. The arrangement of devices for raising and lowering the punches c' c', for the purpose specified, the same consisting of the wheel-block e', connecting and projecting arms f' f', and rods g' g', operating together substantially as described.

A. J. ROBERTS.

Witnesses:
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B. F. BROWN.