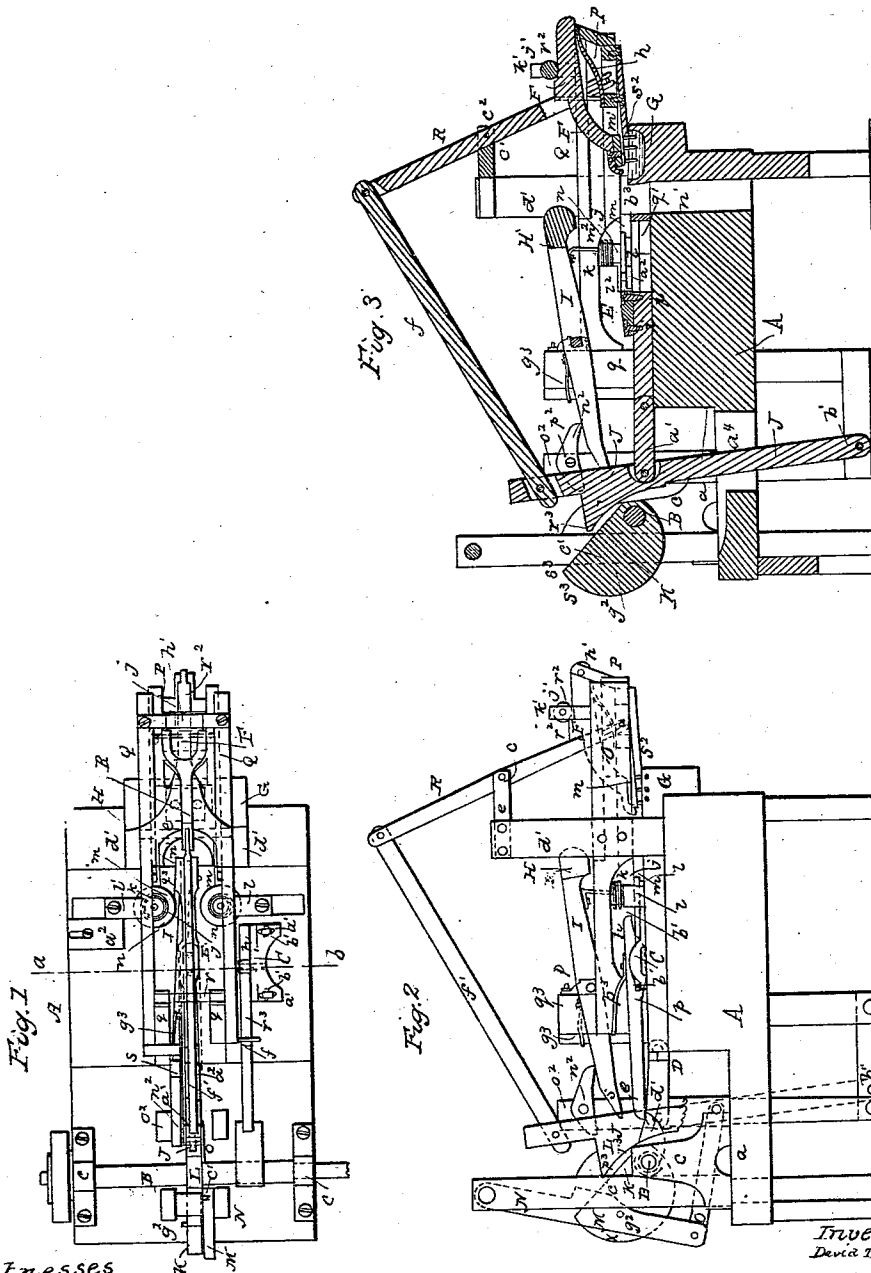


D. T. ROBINSON.  
Horseshoe Machine.

2 Sheets—Sheet 1.

No. 64,254.

Patented April 30, 1867.



Witnesses  
G. W. Baldwin  
C. L. Turner

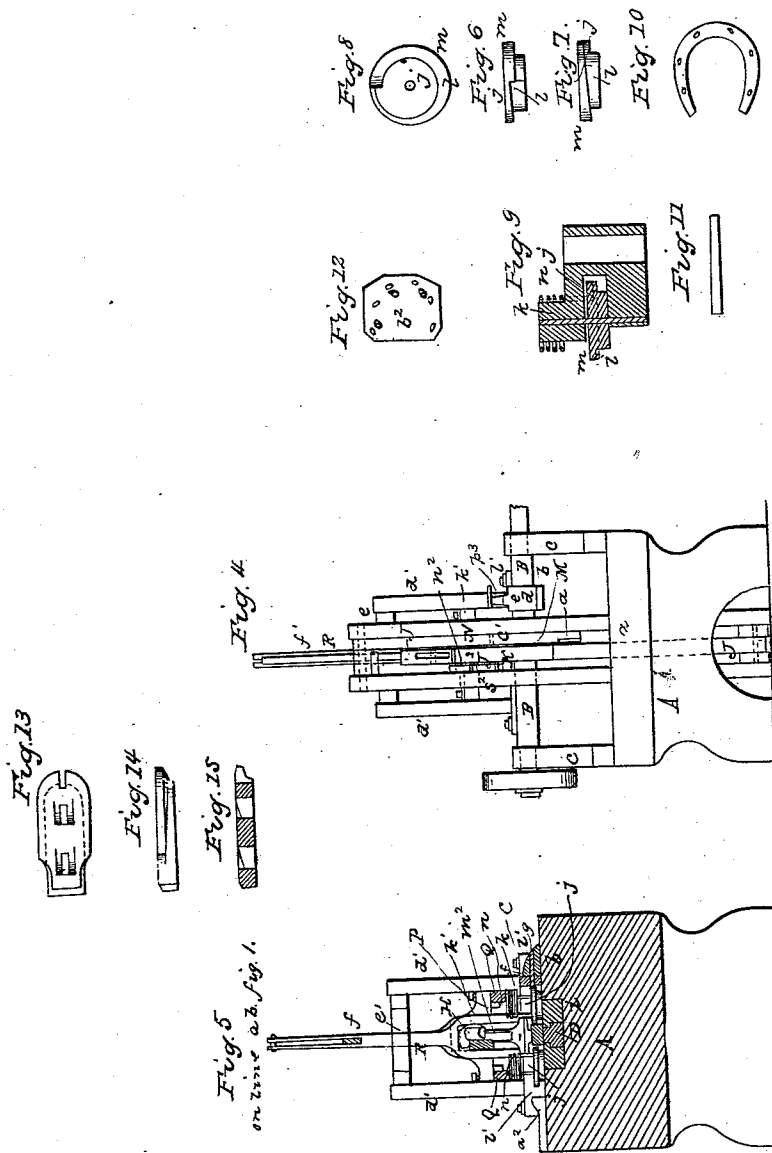
Inventor  
David T. Robinson  
by his attorney  
Frederick Curtis

### Horseshoe Machine.

2 Sheets—Sheet 2.

No. 64,254.

Patented April 30, 1867.



Witnesses  
C. W. Baldwin  
S. L. Turner

Inventor  
Daniel I. Robinson  
by his attorney  
Frederick Curtis

# United States Patent Office.

DANIEL T. ROBINSON, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 64,254, dated April 30, 1867.

## IMPROVEMENT IN MACHINES FOR MAKING HORSE-SHOES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, DANIEL T. ROBINSON, of Boston, county of Suffolk, and State of Massachusetts, have invented a new and improved Machine for Making Horse-Shoes, and do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a top view or plan.

Figure 2, a side elevation.

Figure 3, a vertical and horizontal section.

Figure 4, an end view; and

Figure 5, a vertical and transverse section of a machine constructed in accordance with my invention.

Figures 6 and 7 are side views; and

Figure 8 an under side view of one of the shaping dies or disks, to be hereinafter described.

Figure 9 is a vertical section of one of the said dies and its carriage, to be hereinafter explained.

Figure 10 is a bottom view; and

Figure 11, a side elevation of a horse-shoe as constructed by the aforesaid machine.

Figure 12 is an under side view of the punch-carrier and its punches, to be hereinafter referred to.

In the drawings, A denotes the bed of the machine, it being formed of a table, *a*, and a rising portion or operating-bed, *b*. The driving-shaft of the machine is shown at B as supported by suitable standards *c c* erected upon the table *a*; this shaft having affixed to it a finger or tripper, *d*, for raising the longer arm *e* of a lever, *f*, which turns upon a fulcrum, *g*, applied to one side of an adjustable cutter-block or rest, C, as shown in fig. 5 of the accompanying drawings, the shorter arm *h* of this lever forming, in conjunction with the upper edge of the rest C, a pair of shears to sever the shoe-blanks from a strip of iron as it may be fed between them, the arm *e* being depressed by means of a spring, *p*<sup>3</sup>, suitably applied to it. The cutter-block C is to be applied to the bed *b* in any suitable manner to allow of its being advanced and retracted as occasion may require, the device, as shown in the drawings, being slots *a' a'* and screws *b' b'* to pass through them and screw into the bed. A longitudinal groove or recess, *i*, is made in the bed *b* for reception of a sliding carriage, D, the top surface of which is on a level with that of the bed *b*, the said carriage D having a former or shaping-die, E, applied to its upper surface, the shape and size of this former E conforming to the different sizes and styles of horse-shoes to be constructed by the machine. Two shaping and reducing-dies or disks *j j* are applied to the bed *a*, on opposite sides of the former E and its carriage, and equidistant therefrom, as shown in figs. 1 and 5 of the drawings, these dies being capable of making a partial revolution about a vertical post or stud, *k*, projecting upward from an adjustable slider, *l*, applied to the bed *b*, so as to be capable of lateral adjustment. One of these dies is shown in figs. 6, 7, and 8, of the drawings as constructed with an irregular or eccentrically-shaped periphery, *l*, and an overhanging flange, *m*; the shape of this periphery and flange being such as to reduce the heel of the shoe laterally and to cause a corresponding increase in its height.

Reciprocating longitudinal movements are imparted to the carriage D by means of a pitman, *a'*, jointed to it, the opposite end of such pitman being jointed to a long upright vibrating lever or bar, J, supported by a fulcrum, *b''*, applied to the under side of the bed of the machine, as shown in the drawings, and extending upwards through a slot, *a'*, formed therein. This bar J is moved forward by the action of a cam or wiper, K, applied to the driving-shaft B, the said wiper K pressing against a curved inclined projection, L, making part of the bar J, the rearward movement of the said bar being effected by a stud, *c'*, applied to one side of the wiper K, which acts against a pendulous rod, M, supported by a standard, N, erected upon the table *a* of the machine, as represented, a connecting-rod, O, connecting the lower end of this pendulous bar M with the upright lever J at about its middle, or as represented in the accompanying drawings. A portion, *r*<sup>3</sup> *r*<sup>3</sup>, of the curved surface of the projection L, before mentioned, is concentric with the axis of the wiper K, when in conjunction with it, a portion, *s*<sup>3</sup> *s*<sup>3</sup>, of the periphery of the said wiper being also concentric with its axis, the object of this being to cause a cessation of the forward movement of the bar J, and consequently allowing the forming-die E, and with it the shoe, to remain stationary while the punches are descending and-forming the nail-holes in the shoe. The

strip of red-hot iron, having been previously creased upon its edge, in a manner well known to persons skilled in the art, is to be placed upon the upper edge of the block C, and under the arm A of the shears, while such arm is at its highest position, and until the end of the strip comes in contact with a stop,  $a^2$ , suitably applied to the bed  $b$ . Upon revolution of the driving-shaft, the tripper  $d$  will actuate the shears so as to cut off a portion of the iron strips, of a sufficient length to form a shoe, the piece of iron so severed falling upon the bed  $b$ , in advance of the former E, and between it and the dies. The forward movement of the carriage D carries the forming-die E in contact with the strips of iron, and as the former E advances, the iron is carried forward by it and between the reducing-dies  $j, j$ , by which it is bent around the forming-die E, and in contact with its opposite sides, and consequently has the shape of the die imparted to it, the action of the reducing-dies  $j, j$ , in the mean time, by means of their eccentric-shaped periphery and flange, before referred to, having reduced the heels of the shoe into the shape as shown in figs. 10 and 11 of the drawings. It will thus be seen that the dies, in conjunction with the former E, answer the purpose of both shaping the shoe and reducing its heels. The forward movement of the iron causes a partial rotation of the dies  $j, j$  on their axes, a reverse movement of them to their nominal position being effected by means of a coiled spring,  $n$ , one end of which is fixed to the upper surface of the die, and the other end to the post  $k$  or some contiguous part of the machine.

The punches for forming the nail-holes in the creases of the shoe are shown at  $o, o, o$ , etc., as secured to a movable or adjustable plate,  $b^2$ , applied to the inner end of a bar, F, their disposition or arrangement thereon being such as to conform to the shape of the shoe which they are to puncture; the object of applying them to the bar F, in an adjustable manner, being to change them in accordance with the various sizes and styles of shoes. The portion of the bed  $b$  below the shoe and punches, when the shoe is in a position for being punched, should also be made adjustable or with a movable matrix,  $g^2$ , conforming in size and arrangement with the series of punches, the object of this movable matrix being to allow the punches to go entirely through the shoe.

The bar F has suitable machinery applied to it for imparting the movements necessary to cause it to advance at the proper time and bring its series of punches in position over the shoe after being formed, and subsequently, after receiving the blow of the hammer, to be retracted and lowered in such manner as to dip the punches into a tank, G, containing water, for the purpose of cooling the punches and prevent their being heated to an injurious extent.

The machinery above referred to for operating the bar F consists as follows:

The said bar is hinged, at its outer extremity, to a sliding carriage, P, suitably supported by guides Q Q applied to the operating-bed  $b$ , as shown in the drawings; this carriage P having reciprocating longitudinal movements imparted to it by means of an oscillating furcated lever, R, which is jointed to it; this lever R turning at its middle upon a fulcrum,  $e^2$ , supported by posts  $d'$  and a cross-bar,  $e^1$ , as represented, the upper extremity of said lever being jointed to one end of a long pitman,  $f^1$ , the opposite end of which is jointed to the upper end of the bar J before referred to as constituting part of the mechanism for operating the sliding carriage D. As this bar J is moved backward and forward by its actuating mechanism, before described, the carriage P will have corresponding reciprocating movements imparted to it.

The hammer is shown at H as attached to the front end of an oscillating beam, I, duly supported, as shown in figs. 1 and 2 of the drawings, by means of journals  $r, r$  projecting laterally from it, and upheld by boxes applied to vertical posts  $q, q$  rising upward from the table. The hammer has its proper movements imparted to it by means of a stud,  $g^2$ , applied to the outer side of the wiper K, before referred to as fixed to the driving-shaft B, this stud striking against the rear extremity of the portion or arm  $s$  of the beam I, the wiper K being so applied to the shaft as to cause the hammer to descend by its own gravity upon the forward end of the bar F, while it and the punches may be in position over the shoe, which will take place when the sliding carriage D and former E have reached the limit of their forward movement. After the punches may have descended, and, by the blow of the hammer, punctured the shoe, by continued revolution of the driving-shaft, the wiper K or its stud will pass by the arm  $s$  of the hammer-beam I, which will be forced downward by the action of a spring,  $g^3$ , applied to its upper surface as represented, and raise the hammer from off the punch-carrier F, which will be thrown upward to its original position by the action of a spring,  $h^1$ , applied to its under part, as shown in the accompanying drawings. Provided this spring  $h^1$ , however, has not power enough to effect this object, I have applied a device for insuring the raising of the punch-bar F and its punches; such device being a hook,  $m^2$ , applied to the forward end of the hammer-head, which, as the hammer descends and strikes its blow, will catch under the forward end of the punch-bar F. After the stud  $g^2$  of the wiper K has actuated the hammer-bar and passed by it, it will strike against the rear end of a tripper,  $n^2$ , applied by a fulcrum-screw,  $p^2$ , to a post or standard,  $o^2$ , rising upward from the table  $a$ , as shown in fig. 3 of the drawings, thus depressing the forward end of the tripper, which will strike against the hammer-bar, and, by depressing it, again raise the hammer, and consequently so start the punches from out the shoe as to enable the spring to complete the upward movement of the punch-bar. After this operation has taken place, and by the continued revolution of the driving-shaft the wiper K will so actuate the bar M that it, by means of the connecting-rod O, will force the upright bar J backward, which will actuate the lever R in such manner as to throw the carriage P, and consequently the punch-carrier F, in an opposite direction or away from the former E. This punch-carrier F has an inclined projection,  $r^2$ , on its upper surface; a friction-roller,  $j'$ , applied to an arched bar,  $k^1$ , straddling the guides Q Q, serving to depress the said carrier, as it reaches its extreme backward movement, and dip its punches into the tank or reservoir G containing running water, the object of this operation being to cool the said punches, which would otherwise become very much heated and lose their temper, in the process of punching the heated iron. The spring  $h^1$ , before referred to, serves to elevate the carrier F and raise its punches from out of the tank after it may have passed from under the roller  $j'$  in its forward movement towards the forming-block E.

In order to hold the shoe more securely against the forming-die E, I apply to the under side of the carriage P a bar or abutment,  $S^2$ , which abuts against the toe of the shoe when the punch-carrier has reached its extreme forward movement, thus clamping the shoe tightly against the said former E.

For the purpose of discharging the shoe from the machine, after it may have been formed, I apply to the under side of the punch-carrier F, as shown in fig. 3 of the drawings, a spring-hook or catch,  $m^1$ , which slips over the inner edge of the toe of the shoe when the carrier F has reached the extreme of its forward movement, or at the same time that the abutment  $s^2$  brings up against the outer edge of the shoe, there being a short slot,  $t^2$ , formed in the front end of the forming-die E for its reception. On the return movement of the punch-carrier F, the shoe, by means of the hook  $m^1$ , will be carried with it until it comes to a hole or passage,  $n^1$ , made through the bed  $b$  of the machine, down which it will drop by its own gravity into a proper receptacle.

I would remark here that the forming-die E may or may not have a lip or flange on its front end to aid in preventing the shoe from being raised upward while the punches are being withdrawn from it. If considered desirable, the hammer H may have power applied to it to cause it to descend upon the punch-carrier with more force than its own gravity generates.

For the purpose of constructing a "snow-shoe" in the above described machine, I construct a shaping-die or former, as shown in Figures 13, 14, and 15 of the accompanying drawings, of which, fig. 13 is a top view; fig. 14, a side elevation; and fig. 15, a longitudinal section of such former. In these figures it will be seen that the former has a projecting flange,  $a^1$ , at its upper part. It also has two slots made lengthwise in it for the reception of confining-screws. The upper surface of the forming-die surrounding the slots, or that portion of it receiving the heads of the confining-screws, is inclined to a considerable extent, as shown in fig. 15, above referred to. As the shoe, after being formed and punched, is forced forward, the forming-die will be carried with it a short distance. As the shoe is carried on its way, the inclined surface about the slots will allow the former to be raised by the increased thickness of the heels of the shoe, and let the said shoe be drawn away from contact with the former.

I am aware of United States Patent, No. 55,042, and dated May 29, 1866, in which two levers turning at about their centre upon a fulcrum, applied to opposite sides of a sliding carriage, carrying a forming-die in manner somewhat similar to mine has been employed, the action of the iron, as it moves forward, striking upon the forward end of the lever, serving to force its opposite end inward and towards the forming-die; consequently I lay no claim to the subject of the said patent.

1. I claim the shears or cutting mechanism, consisting of the adjustable cutter-block C and the lever  $f$ , operated by the finger  $d$  and spring  $p^3$ , all constructed and arranged in the manner and for the purpose as before described.

2. I also claim the mechanism for dipping the punches into water, consisting of the arm or carrier F, friction-roller  $j'$ , carriage P, guides Q Q, and furcated lever R, the said lever being operated by the lever J, in manner as before described.

3. I also claim the water tank, combined with this machine in the manner described.

4. I also claim the peculiar construction, as well as the application, of the shaping and reducing-dies  $j, j'$ , as before described.

5. I also claim combining with the carriage P the spring-hook  $m^1$  and abutment  $s^2$ , essentially in manner and for the purpose as before explained.

6. I also claim the mechanism for operating the sliding carriage D, the same consisting of the lever J, bar M, connecting-rod O, and wiper K, constructed and combined substantially in manner and to operate as before set forth.

7. I also claim the combination with the hammer-bar of the tripper  $n^2$ , and stud  $g^3$  of wiper K, under the arrangement and for operation as set forth.

8. I also claim the hook  $m^2$ , in combination with the hammer, and with the lip  $b^3$  on arm F, for the purpose of starting the punches from the shoe, substantially as described.

9. I also claim the peculiar construction and application of the forming-die for shaping snow-shoes, essentially as described.

10. I also claim the combination and arrangement, as herein described, of all the several devices constituting this machine.

DANIEL T. ROBINSON.

Witnesses:

FRED. CURTIS,  
C. W. BALDWIN.