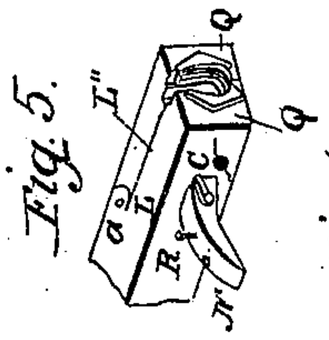
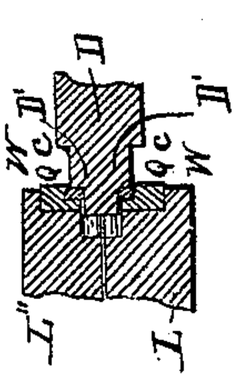
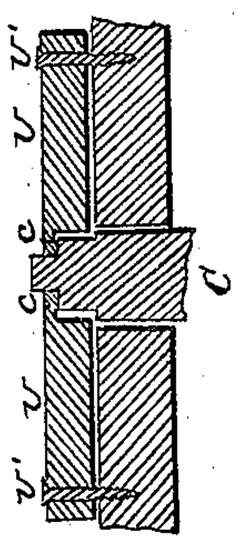
L. D. ROBERTS.

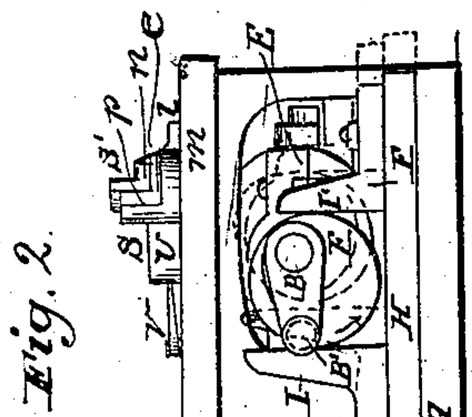
Horseshoe Machine.

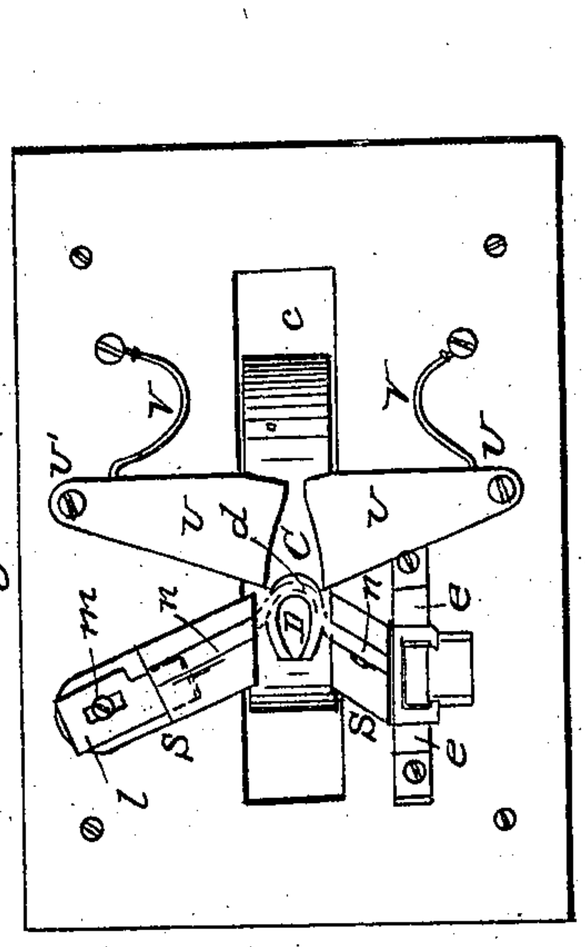
No. 36,370. Patented Sept. 2, 1862.

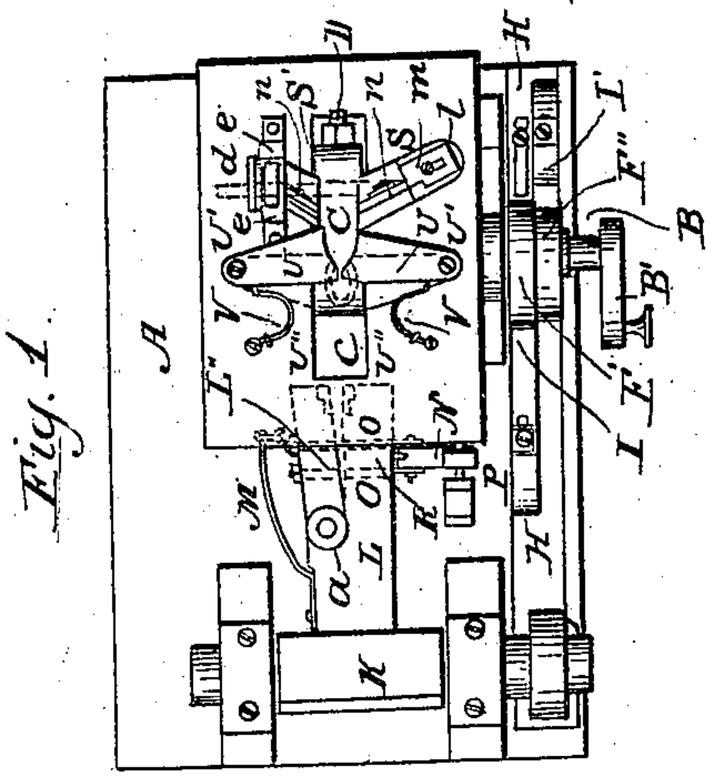


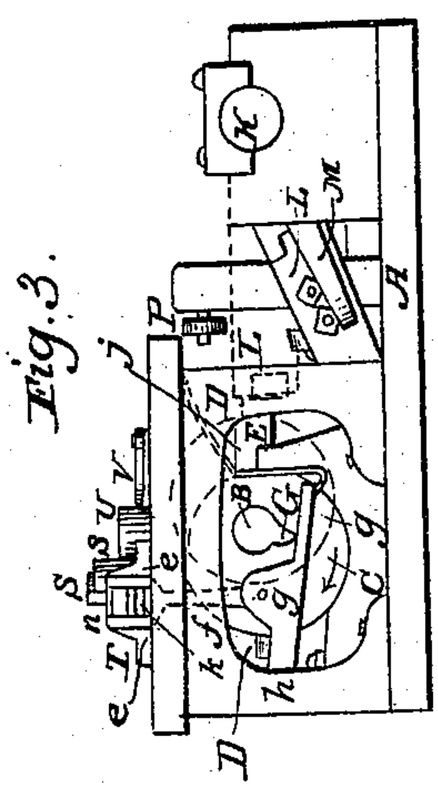












Witnesses:
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UNITED STATES PATENT OFFICE.

L. D. ROBERTS, OF CLEVELAND, OHIO.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOES.

Specification forming part of Letters Patent No. **36,370**, dated September 2, 1862.

To all whom it may concern:

Be it known that I, L. D. ROBERTS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Horseshoe-Machines; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan view. Fig. 2 is a side view. Fig. 3 is a side view of the opposite side shown in Fig. 2. Fig. 4 is an end view, and Figs. 5, 6, 7, 8, and 9 are sections which will be referred to in the description.

Like letters refer to like parts in the several views.

The frame-work, boxes, and other stationary parts are all secured to the bed-plate A.

On the main shaft B is secured the revolving eccentric C, to which is attached the shoe-mandrel D. This shaft B has its bearings in the boxes E. To one end of this shaft is secured two cams, F F′, as seen in Figs. 1 and 2, and to the opposite end is secured a cam, G, Figs. 3 and 4, which cam is for operating the cutters or shears for cutting off the bar of which the shoe is made, as hereinafter described.

H represents a bar which slides in ways upon the bed-plate A and at right angles to and below that end of the shaft B that carries the cams F and F′. It has two arms, I and I′, rising from its upper surface, which embrace the cams F and F′. Consequently by the revolution of the shaft B the bar H is moved back and forth upon the bed-plate A to an extent equal to the eccentricity of the cams.

K is a rock-shaft placed parallel to the shaft B, but at the opposite end of the bed-plate. To one end of the shaft K is attached an arm, J, which fits into a slot in the bar H, as seen in Fig. 2. Thus the rock-shaft K is put in motion by the primary action of the shaft B.

L shows an arm which projects downward and forward, as seen in Figs. 2 and 3, from the rock-shaft K, to which it is securely attached, and is moved from L to L′ by the movement of the rock-shaft K. The arm L has a secondary arm, L″, (see Fig. 1,) pivoted to it at *a*. It is drawn away from L by the spring M, and connected to a cam-lever, N, by the rods O O, which pass loosely through holes in the arm L, then into the secondary arm L″, where they are secured by nuts or otherwise.

The cam F acting on the arm I′ and by the intervention of the bar H and arm J, the rock-shaft K is so operated as to raise the arm L from its position in Figs. 2 and 3 to L′, as indicated by the dotted lines in Figs. 2 and 3, and by the action of the cam F′ on the arm I the arm is depressed to L, Figs. 2 and 3.

The secondary arm L″ is made to move to and from the arm L by the action of the spring M and the cam-lever N. Thus the arm L″ has two movements—vibratory and lateral—while the arm L only vibrates vertically. When the arm L is raised to L′ for the purpose of receiving the partly-formed shoe from the mandrel D, the secondary arm L″ is drawn close to the arm L, as seen in Fig. 5, which is done by means of the connecting-rods O O, Figs. 1 and 5, and cam-lever N in connection with the roller P.

The rods O O are pivoted to the cam-lever N, which pivot constitutes the fulcrum of the cam-lever. As the arm L is raised the long arm of the cam-lever N is brought under the roller P, thereby depressing the long arm of the cam-lever, and as the arm L rises by this action the short arm N′ of the cam-lever presses against the side of the arm L, thereby drawing upon the rods O O, and this brings the secondary arm L″ close to the primary arm, as seen in Fig. 5, and as soon as the primary arm moves down, so as to relieve the cam-lever N from pressure of the roller P, the spring M by its action forces the secondary arm L″ back to the position seen in Fig. 1.

Into the end of the arms L L″ is screwed the dies Q Q in sections, one-half being in each. These dies may be of various sizes for various sized shoes, those for making shoes for mules being much smaller than those for making horseshoes. The screw R regulates the distance the arms L L″ separate.

The shoe-bar *d* is fed into the gages S S′, as indicated by the red lines in Figs. 1 and 4, and cut off by the cutter or shears T, Figs. 1 and 3. The iron (being hot) is then, by the action

of the revolving mandrel D upon the eccentric C, forced out of the gages into the jaws U U. These jaws U U are pivoted to the plate *m* at U′ U′, their form and relation to other parts being fully shown in enlarged Fig. 8, Plate 2. The mandrel presses upon the heated bar when in the gages in the center of it, the bar being so cut and adjusted by means of the stop *l* that the ends are equidistant on each side of the mandrel D, which prevents one side of the shoe from being longer than the other in forming. As the iron is being forced out of the gages and carried forward to the jaws U U, it is bent around the mandrel, partially forming the shoe. Directly on leaving the gages the partly-formed shoe *d*, Fig. 8, enters the jaws U U, which press it around the mandrel D, as indicated in Figs. 1, 7, and 8. This pressure increases upon the edges of the shoe as the mandrel advances with the partially-formed shoe in the jaws, which move with the mandrel until it has passed the axis U′ U′ of the jaws, the mandrel passing out from between them, the springs V V moving the jaws back to their original position, as seen in Fig. 8. The mandrel, on leaving the jaws, carries the partly-formed shoe forward to the dies Q Q in the ends of the arms L L″, which are raised to the exact position to receive the mandrel and partly-formed shoe. The position of the mandrel with the shoe *c* in the dies Q Q is shown in Fig. 6. In this position the shoe is completed by being pressed between the male and female dies into the desired form, as seen in Fig. 6. The pressure upon the shoe increases from the moment the mandrel enters between the jaws until the extreme circumference of the eccentric C, upon which the mandrel D is placed, passes the axis of the rock-shaft K. Then by the action of the spring M the arm L″ moves back, as seen in Fig. 1, and the mandrel withdraws from the dies as it is carried around on the eccentric C, leaving the shoe in the female dies, and the shoe falls out as the arm L″ moves back, thus opening the dies. The arm L again rises as the eccentric C moves around with the mandrel D, and the dies Q Q are brought into position to receive the next forming shoe.

It will be noticed that the female die Q Q is dovetailing or inclined under, as seen at W, Fig. 6. This gives the shoe a slant or taper from the hoof, which is desirable, and as the shoe cools it will shrink around the mandrel and tend to draw the shoe out of the dies; but by dovetailing the female dies, as above shown, the shoe cannot be drawn therefrom by the mandrel, and the mandrel, being also tapering, is thereby readily withdrawn from the shoe, leaving it in the female die. Thus a twofold object is obtained—that of beveling the shoe and withdrawing the male die.

The movement of the mandrel gives a rolling pressure by the shoulders D′ upon the shoe from the toe to the heel; consequently the whole pressure is not upon the entire shoe at once, which relieves the machine from the strain required in pressing the whole face of the shoe at once. Besides, a rolling pressure such as I have accomplished makes a more perfect shoe, for any surplus iron the pattern *d* may contain is rolled or pressed onward into the heel of the shoe.

The shears T work in guides *e e*. To the shears is attached a connecting-rod, *f*, which is attached to the lever *g* by a pin-joint, *g′*, the end of the lever being hung to the rod *h*, Figs. 3 and 4, which forms its fulcrum. The rod *i* is connected to the end of the lever and to the spring *j*, Fig. 3. By the action of this spring *j* the lever *g* is raised, and with it the cutter, so that the heated bar *d* can be passed into the gage (see Figs. 8 and 9, Plate 2) through the opening *k* in the shears under the cutter T. By the action of the cam G upon the lever *g* the cutter is so operated that the iron is cut off from the bar the desired length for the shoe just before the mandrel takes it from the gages.

The gage S is bolted to the top of the plate *m*, as is also the gage S′, in such a manner that they can be set to or from each other in proportion to the size of the shoe. In the gage S is a movable slide, *l*, which is secured in place by the screw *m′*, Fig. 8. The inner end of said slide is turned up at right angles, as seen in Figs. 4 and 9, against which the end of the bar is pushed, so as to determine the length to be cut off for the shoe. This slide can be readily adjusted to gage the length of the iron for shoes of any size, and a mandrel of any desired size may be attached to the eccentric C, and the gages adjusted accordingly. As the bar is fed into the gages flatwise and the mandrel presses upon the edge of the iron in forcing it from the gages, the tendency is to tip or turn the flat side of the bar to the mandrel, which would spoil the shoe and cause an undue strain upon the machine. To prevent this and to keep the bar in a flat position I use the two clamps *n n*, Figs. 2, 4, 8, and 9, which are so secured to the upright portions of the gages that they may be raised or lowered according to the thickness of the bar. Consequently, when the bar is in the clamps, it cannot turn flatwise to the mandrel.

What I claim as my improvement, and desire to secure by Letters Patent, is—

1. The combination of the eccentric C, mandrel D, and the primary and secondary arms L L″, when operating conjointly in the manner and for the purpose set forth.

2. The cam-lever N, rods O O, and spring M, in combination with the roller P and arms L L″, in the manner and for the purpose specified.

3. The arrangement of the cams F F′ and arms I and I′, in combination with the bar H, arm J, rock-shaft K, and arms L L″, substantially as and for the purpose set forth.

4. The jaws U U, springs V V, gages S S′, and mandrel D on the eccentric C, when arranged to operate conjointly in the manner and for the purpose specified.

5. The adjustable gages S S′, with the movable slide *l*, and adjustable clamps *n n*, operating conjointly with the mandrel D and jaws U U, as and for the purpose herein described.

6. The cam G, lever *g*, and spring *j*, in combination with the shears or cutter T, operating in the manner and for the purpose set forth.

L. D. ROBERTS.

Witnesses:
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