2 Sheets--Sheet 1.

R. & R. W. HALE.

Machine for Bending and Swaging Horseshoe-Blanks.

No. 167,894 Patented Sept. 21, 1875.

Fig 1.

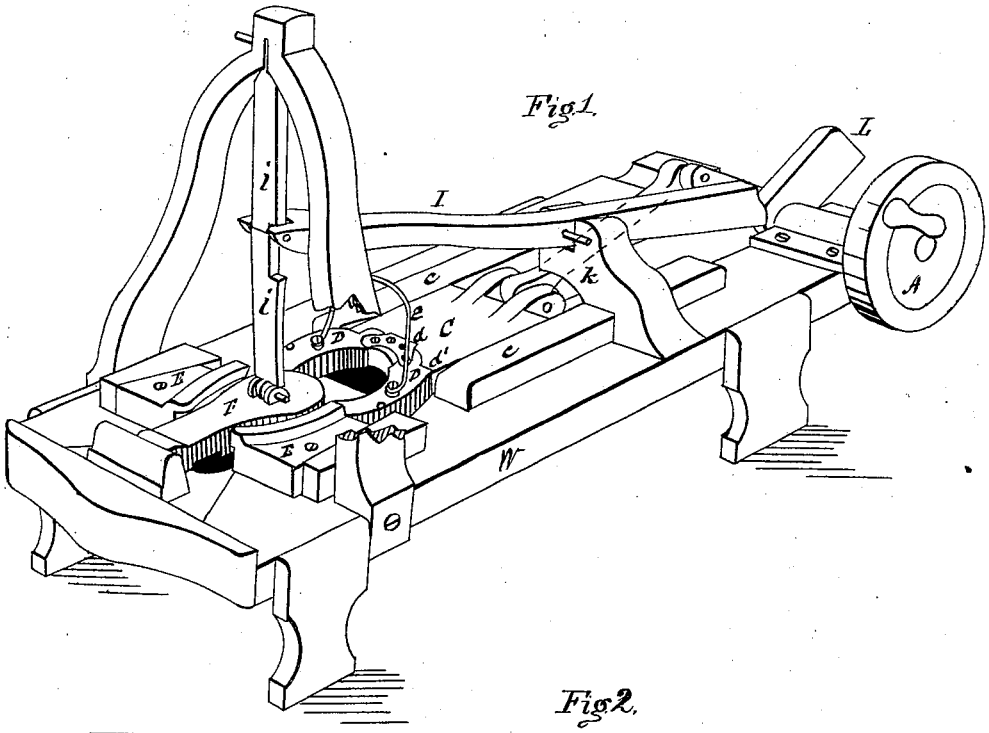
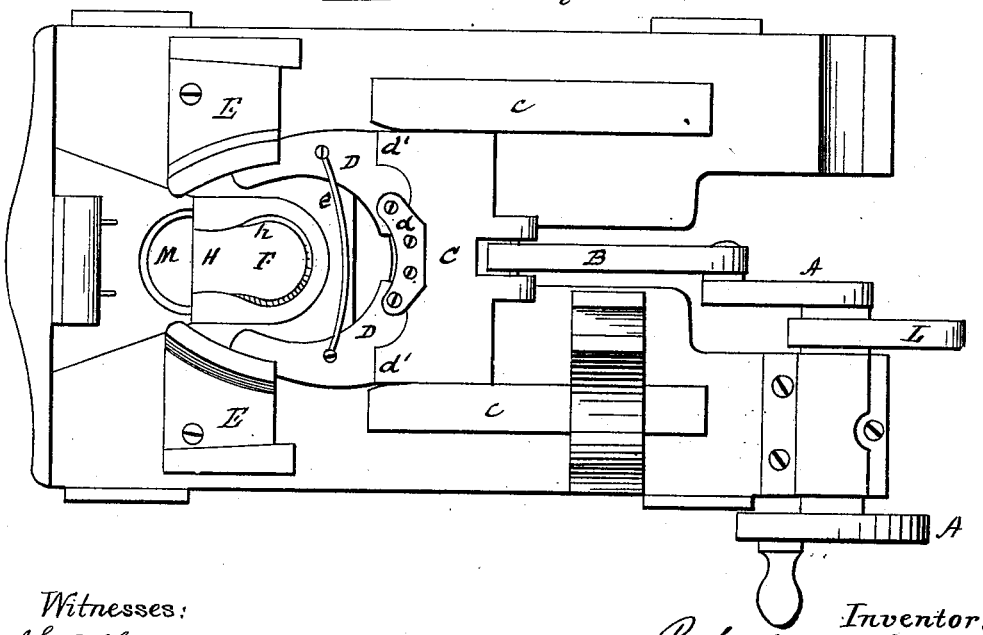


Fig 2.



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2 Sheets--Sheet 2.

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Fig. 3.

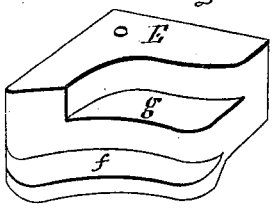


Fig. 4.

Fig. 5.

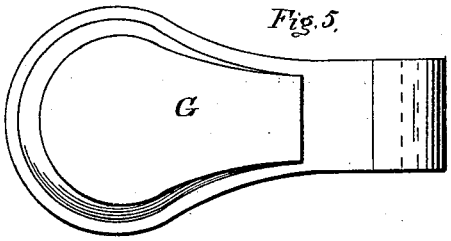
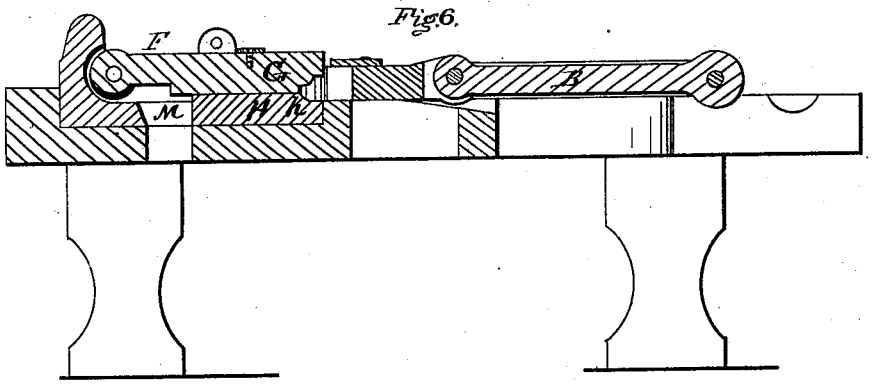


Fig. 6.



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UNITED STATES PATENT OFFICE.

ROBERT HALE AND ROBERT W. HALE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN MACHINES FOR BENDING AND SWAGING HORSESHOE-BLANKS.

Specification forming part of Letters Patent No. **167,894**, dated September 21, 1875; application filed September 3, 1875.

To all whom it may concern:

Be it known that we, ROBERT HALE and ROBERT W. HALE, of Chicago, Illinois, have invented certain new and useful Improvements in Machines for Bending and Swaging Horseshoe-Blanks, of which the following is a clear, full, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of a bending-machine with our improvements attached. Fig. 2 shows a plan view with the upper portion of the die removed. Fig. 3 shows, in perspective, the under side of one of the guides as recessed. Fig. 4 is an elevation of one of the formers detached. Fig 5 shows the under side of the upper half of the die. Fig. 6 is a longitudinal section through the die.

To enable others skilled in the art to make and use our invention, we will proceed to describe the exact manner in which we have carried it out.

Our invention relates to machines for bending and forming horseshoes and other articles of iron and steel; and it consists in the combination and arrangement of parts hereinafter described and claimed.

In the drawings, W is an iron frame or bed, with legs to secure the requisite height. The crank-shaft A is operated by steam or other power, as desired. The rod B forms a connection between the shaft A and the cross-head C, whereby the latter receives a reciprocating motion between the guides *c c*. The segments or formers D D have their inner or near ends recessed in the cross-head C, as shown in Fig. 2, being held in place by the plate *d*, to which they are pivoted. On the outer side of each near end of the formers is the shoulder *d'*, which rests against the cross-head to receive squarely the first force of the pressure as the cross-head moves up to its work, and as the formers are turned in their course by the guides E E the curved form of the recess in the cross-head, corresponding to the curve of the former fitting therein, a constant direct pressure upon the former is secured from the cross-head during the whole operation of bending the metal bar. The outer end of the former is recessed transversely at *d''*, as shown in Fig. 4. The object of this recess is to enable the former, when the end comes first in contact with the metal bar, to overlap the bar and hold it in position while being bent around the die. Across and above the formers we place the bar *e*, or suitable device, to hold the formers apart while approaching the die. The guides E E are curved to correspond with the curvature of the exterior of the formers, and are readily made adjustable to suit the bend required in the metal. To enable us to take in and bend a longer bar than would be allowed by the curve *f* of the guides, we form a wider recess on the lower side of the guides, as shown at *g*, in Fig. 3. This recess enables us to bend bars of greater length than could otherwise be done in the same pair of guides, and secures a considerable latitude in operation of our machine.

Our die F is constructed of two parts, the upper part G and the lower part H. (See Fig. 6.) The lower portion is made convex, as shown at *h*, so as to produce a proper concavity in the horseshoe. The upper portion of the die is made to conform to the shape of the shoe or other article to be formed. The heels of the shoe being properly drawn in, as required for use, can only be removed from the die by having the die itself to open. To accomplish this purpose we connect the lever I to the upper portion of the die by means of the toggle-joints *i i*, and this lever, working in the supporting-guides *k*, is operated by the cam L on the crank-shaft A, whereby, at every revolution of the shaft, the lever is forced forward a sufficient distance to raise the portion G of the die, which portion is hinged or pivoted, as shown in Fig. 6. When the upper portion is thus raised the shoe is easily removed, and drops into the receptacle prepared for the purpose. In the rear of the lower die or lower portion H of the die we form the opening M, through which to discharge the scales and dirt which necessarily accumulate at this part of the machine, and which would otherwise seriously interfere with the proper working of our machine.

It is evident from the above description that instead of raising the upper half of the die to

release the shoe, the under half may be allowed to drop by means of similar mechanism to accomplish the same result.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The formers D D, recessed in the crosshead C, in combination with the die constructed in two portions, the guides E E, recessed, as shown, and suitable mechanism for raising or lowering one portion of the die, substantially as and for the purpose set forth.

2. The die constructed in two parts, with the lower part recessed to form a concavity in a horseshoe, in combination with the guides E, recessed, as shown, the formers D D, recessed at their outer ends, and the discharge-opening M, substantially as and for the purpose set forth.

ROBERT HALE.
ROBT. W. HALE.

Witnesses:
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