2 Sheets—Sheet 1.

R. R. MILLER.

Die for Forging Ox-Shoes.

No. 212,251. Patented Feb. 11, 1879.

Fig. 1.

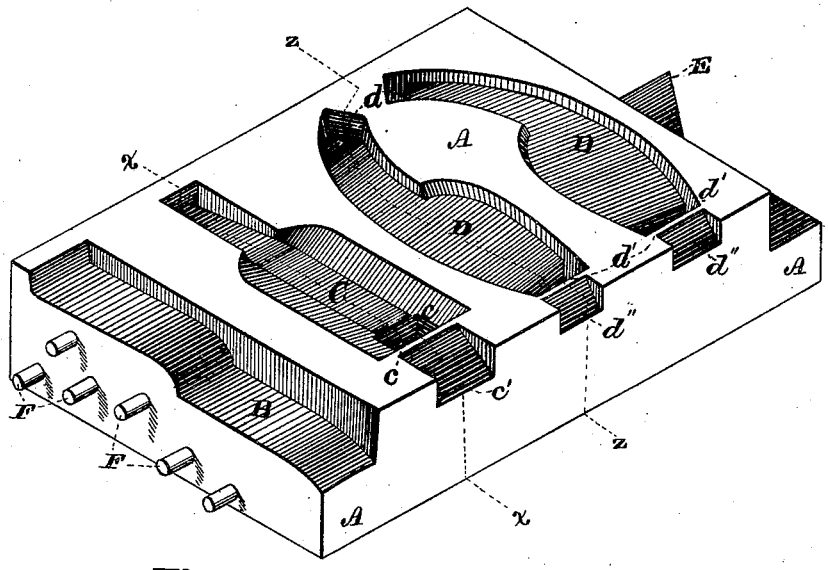


Fig. 2.

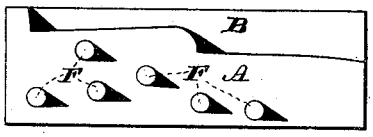


Fig. 3.

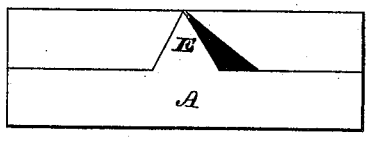


Fig. 4.

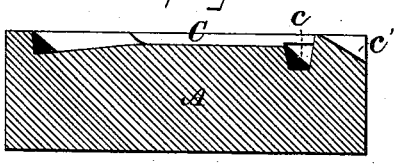
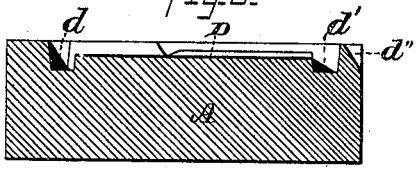


Fig. 5.



WITNESSES:

Jas. E. Hutchinson.

Henry C. Hazard.

INVENTOR.

Robt. R. Miller, by

Prindle and Ley his Attys

2 Sheets—Sheet 2.

R. R. MILLER.

Die for Forging Ox-Shoes.

No. 212,251. Patented Feb. 11, 1879.

Fig. 6.

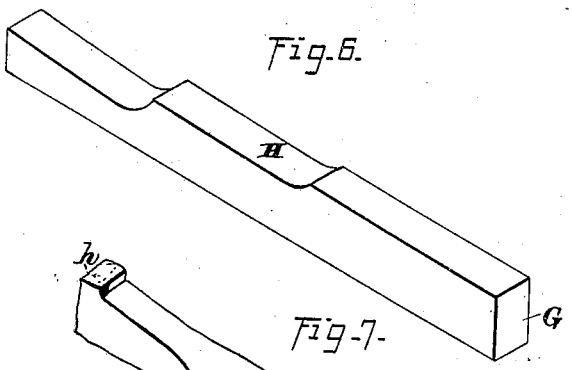


Fig. 7.

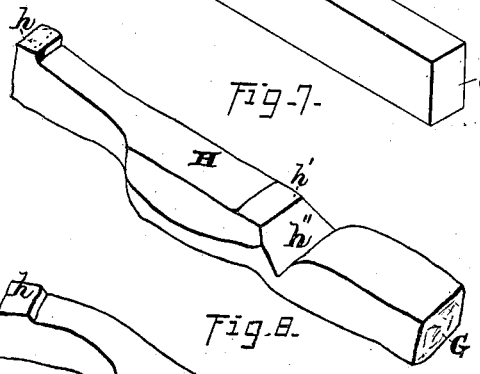


Fig. 8.

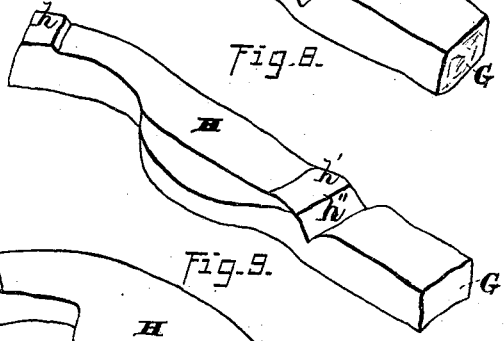


Fig. 9.

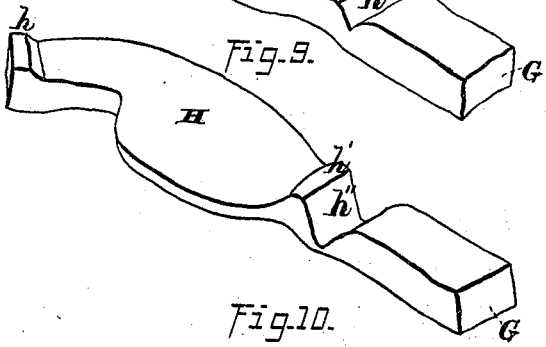
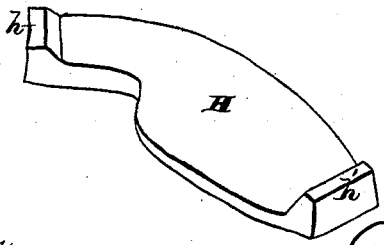


Fig. 10.



WITNESSES:

Jas. E. Hutchinson.

Henry C. Hazard.

INVENTOR.

Robt. R. Miller, by

Pindle and Lay his Attys

UNITED STATES PATENT OFFICE.

ROBERT R. MILLER, OF PLANTSVILLE, ASSIGNOR TO MERIT N. WOODRUFF, OF SOUTHINGTON, CONNECTICUT.

IMPROVEMENT IN DIES FOR FORGING OX-SHOES.

Specification forming part of Letters Patent No. **212,251**, dated February 11, 1879; application filed November 23, 1878.

To all whom it may concern:

Be it known that I, ROBERT R. MILLER, of Plantsville, in the county of Hartford, and in the State of Connecticut, have invented certain new and useful Improvements in Dies for Forming Ox-Shoes; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my lower or female dies, preferably arranged within or upon one block. Figs. 2 and 3 are end elevations of the same. Figs. 4 and 5 are cross-sections upon lines *x x* and *z z*, respectively, of Fig. 1. Fig. 6 is a perspective view of the blank as left by the first die. Fig. 7 is a like view of the same as left by the second die. Fig. 8 is a perspective view of said blank after having been bent. Fig. 9 is a like view of the same after leaving the finishing-die, and Fig. 10 is a perspective view of said blank after having been cut from the bar.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to facilitate the manufacture of ox-shoes; and it consists in the series of dies employed for forming the shoe, substantially as is hereinafter shown and described.

The series of dies employed by me are, preferably, formed in one block; but, if desired, they may be made separate from each other.

In the annexed drawings, A represents a rectangular block of metal, provided within one end with a rabbet, B, which has vertical side and end walls, and at its lower side is given the form shown in Fig. 2. Adjacent to the rabbet or die B, within the upper face of the block A, is a cavity, C, which, as seen in Figs. 1 and 4, has a horizontal width slightly greater than the thickness of the bar of metal to be operated upon, is deepest at its outer end, and from thence decreases in depth to or near its longitudinal center, from thence nearly to its inner end maintains substantially the same depth, and at said inner end has a recess, *c*, which in size and form is substantially like the heel-calk of a shoe. At the immediate rear of the recess *c* the metal is cut away upon a downward and rearward line, so as to leave at such point an ∧-shaped heel, *c'*, the object of which will be hereinafter explained.

From the heel-calk recess *c* forward to a point in advance of its longitudinal center the cavity C is enlarged laterally upon outward and upward curving lines, as shown in Fig. 1.

Within the upper surface of the block A, adjacent to the die C, is formed a recess or die, D, which has the form of the completed ox-shoe, its ends being provided with cavities *d* and *d'*, respectively, for the completion of the toe and heel calks, while from said cavity *d'* the metal is cut away so as to leave a heel, *d''*, that corresponds to the heel *c'* of said die C. Two of the finishing-dies D (a right-hand and a left-hand) are provided within the surface of the block A, while each of the preliminary dies B and C is capable of use upon blank shoes for either of said finishing-dies.

A heel or cutter, E, formed upon one end of the block A, and certain horizontally-projecting pins F, provided upon the opposite end of said block, complete the special forging mechanism, which is used in connection with a drop or other press, and with a plane-faced upper die, as follows: A rectangular bar of iron, G, having suitable dimensions, is placed edgewise within the first die, B, and subjected to one or more blows of the upper die until it receives the form shown in Fig. 6, the shoe-blank H having entered its first stage. The blank H is now placed flatwise within the second die, C, and, after one or more blows from the upper die, receives approximately the form seen in Fig. 7, the body of said blank being forced laterally outward and upward, as shown, the rudiments of a toe-calk, *h*, and heel-calk *h'* formed, and a notch, *h''*, produced in rear of the latter at the point where said blank, when completed, is to be severed from the bar G. The next step consists in inserting the outer end of the blank within the pins F, and bending the same into the curved form shown in Fig. 8, after which said blank is placed flatwise within the proper finishing-die D, and subjected to one or more blows from the upper die, the result being the change of form shown in Fig. 9. The notch *h''*, which has been deepened by the heel *d''* of the die

D, is now placed over the cutter E, and the blank H severed from the bar G by a blow of the upper die, the result being the shoe shown in Fig. 10.

It will be understood that more or less fin will be produced around the edge of the blank by the action of the dies C and D, which fin must be removed by a trimming-die, in the usual manner. All of the operations described may be performed and the finished shoe completed at one heat.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

The series of dies B, C, and D, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of November, 1878.

ROBERT R. MILLER.

Witnesses:
CHARLES H. NEALE,
WALTER HOLCOMB.