2 Sheets—Sheet 1.

H. HAMMOND.

DIES FOR MAKING HOES.

No. 183,561. Patented Oct. 24, 1876.

Fig. 2.

Fig. 1.

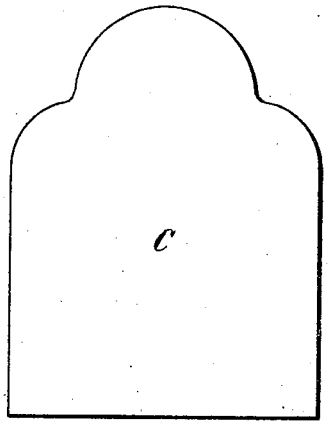


Fig. 4.

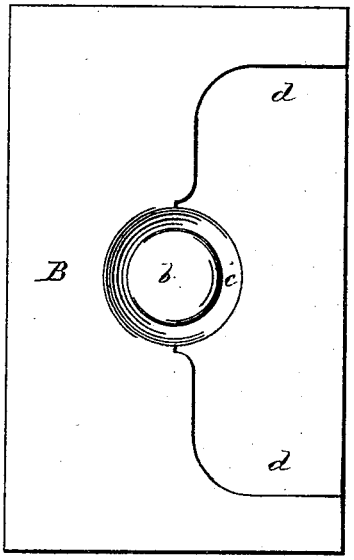
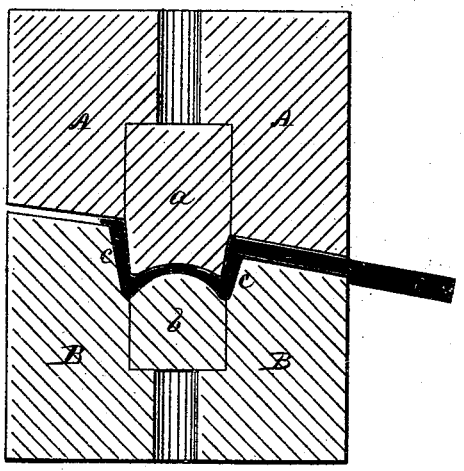


Fig. 3.



Witnesses.

Wendell R. Bowers

John L. Peters

Inventor.

Henry Hammond

by Theo. G. Ellis, attorney

2 Sheets—Sheet 2.

H. HAMMOND.

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Fig. 6.

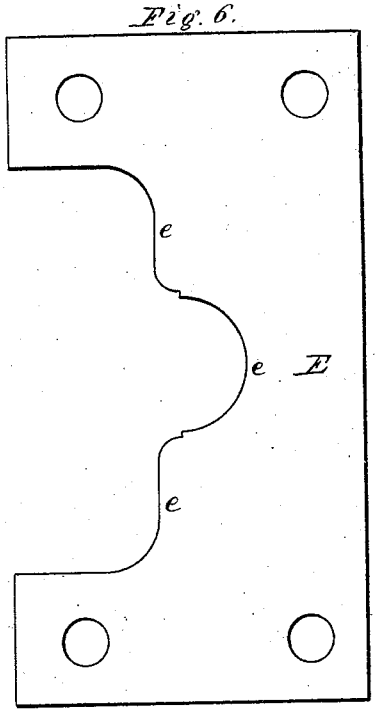


Fig. 5.

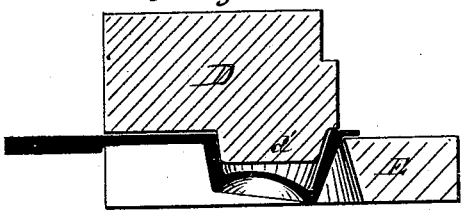


Fig. 8.

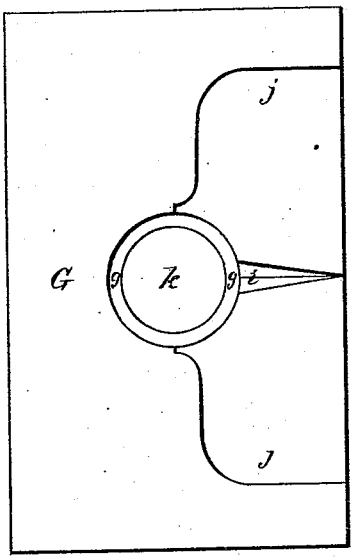
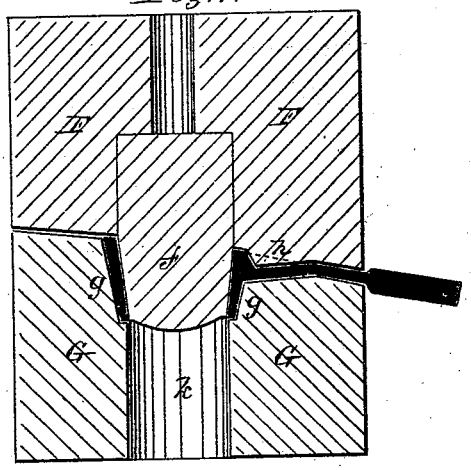


Fig. 7.



Witnesses.

Wm. dell R. Curtis

John L. Peters

Inventor.

Henry Hammond

by Thos. G. Ellis Attorney

UNITED STATES PATENT OFFICE.

HENRY HAMMOND, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN DIES FOR MAKING HOES.

Specification forming part of Letters Patent No. **183,561**, dated October 24, 1876; application filed February 4, 1876.

To all whom it may concern:

Be it known that I, HENRY HAMMOND, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Dies for Making Hoes; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention relates to a method of forging hoes out of a thin plate of metal, under a drop-hammer, in such a manner as to form an elongated socket for the insertion of the handle out of the metal necessarily removed to form the opening. It consists in a series of dies for performing the foregoing operation, and in their construction and operation.

In the accompanying drawings, on two sheets, Figures 1 and 2 are a front and side view of the blank used for making the hoe. Fig. 3 is a vertical section through the first pair of dies, with the hoe between them, showing its form when struck. Fig. 4 is a top view of the lower die. Fig. 5 is a section through the shearing-dies used to remove the web left by the first pair of dies around the hoe. Fig. 6 is a top view of the lower die. Fig. 7 is a vertical section through the third or finishing dies, showing the hoe between them. Fig. 8 is a top view of the lower die.

A is the top and B the bottom of the first pair of dies. The joint between them is at the angle that it is desired to have the blade of the hoe to the axis of the eye or socket, this latter being vertical in the dies. *a* is a cylindrical plug, slightly tapering in the part below the face of the die which enters the socket, and concave on its lower face. *b* is a similar cylindrical plug in the lower die, convex on its top, where it enters the socket of the hoe. Between the ends of these plugs is left a thin space when the dies are brought in contact. Around the projecting ends of these two plugs is a cell, *c*, to partially form the socket of the hoe. The upper die A has a smooth face over the blade of the hoe, and the lower die has a recess, *d*, for giving form and thickness to the blade. When the upper die is raised the blank C is placed upon the lower one, so that its upper curved end is nearly concentric with the plunger *a*. When the upper die descends it forces the metal into the form shown in black in Fig. 3. D and E are the upper and lower shearing-dies, for removing the web left around the forging by the first pair. Their cutting-edges follow the line *e e*, Fig. 6, and the upper die passes accurately through the opening in the lower. The forging is placed between them, in the position shown in Fig. 5, and the descending upper die shears off the web. The projection *d'* holds the forging to its place. F and G are the upper and lower dies of the third pair or finishing dies. The upper die is furnished with a plunger, *f*, somewhat similar to that in the die A; but it is longer, has a convex face, and its lower edge is sharp and shears against the edge of the bottom of the cell *g* in the lower die. It gives the exact form of the interior of the elongated socket, while the cell *g* gives its exterior form. *h* is a small projection upon the upper die, of the same form and corresponding to the recess *i* in the lower die. These are for the purpose of raising a rib upon the blade of the hoe adjoining the socket, to strengthen it at that place. The lower die G has the recess *j j*, to give the proper form to the blade. The forging, as it comes from the shearing-dies, is placed in the lower die G, and, as the die F descends, the plunger *f* cuts out part of the thin shell left in the socket by the first dies, and drops it down through the opening *k* in the lower die. The socket is also further elongated by inverting and turning outward a part of the central convex shell left by the first dies between the plungers *a* and *b*, and also drawing down the material left in the cell *c*, so that it is of less thickness. When it is desired to make a very elongated socket the whole of the central shell can be turned outward by making the lower face of the plunger *f* conical and sharp, instead of being rounded, as shown in Fig. 7. In this case it would not be necessary to provide it with a cutting-edge, as previously described.

The blank is heated in the usual manner before the operation of striking in the dies,

and after it has passed through the operations herein described it can be cut off from the metal remaining outside of the dies to form the finished hoe, or it can have an edge of superior metal welded onto it by a subsequent operation.

What I claim as my invention is—

1. The dies A B, with their plungers *a b* and recesses *c d*, for giving form to the blank, substantially as herein described.

2. The shearing-dies D E, with the projection *d'*, substantially as and for the purpose herein described.

3. The combination of the dies A B, D E, and F G, to form a finished hoe-socket upon the blade from a blank, C, cut from a plate, substantially as shown and described.

HENRY HAMMOND.

Witnesses:

THEO. G. ELLIS,

WENDELL R. CURTIS.