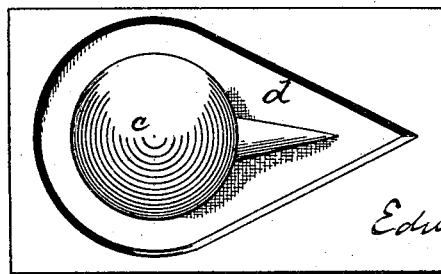
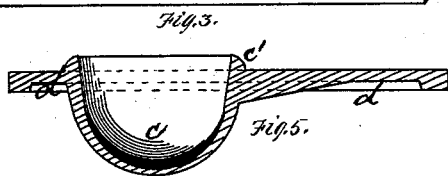
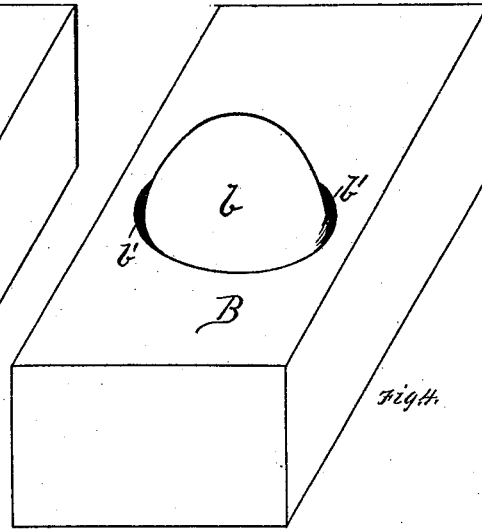
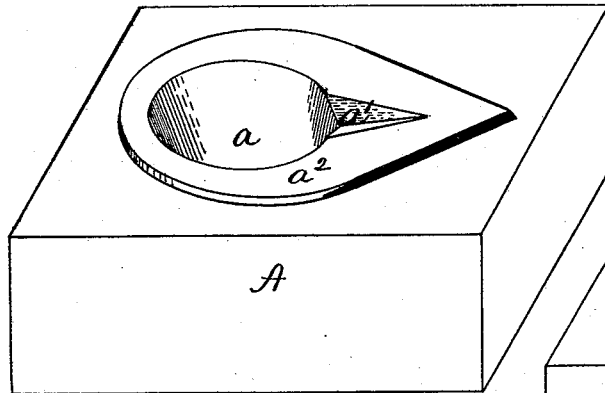
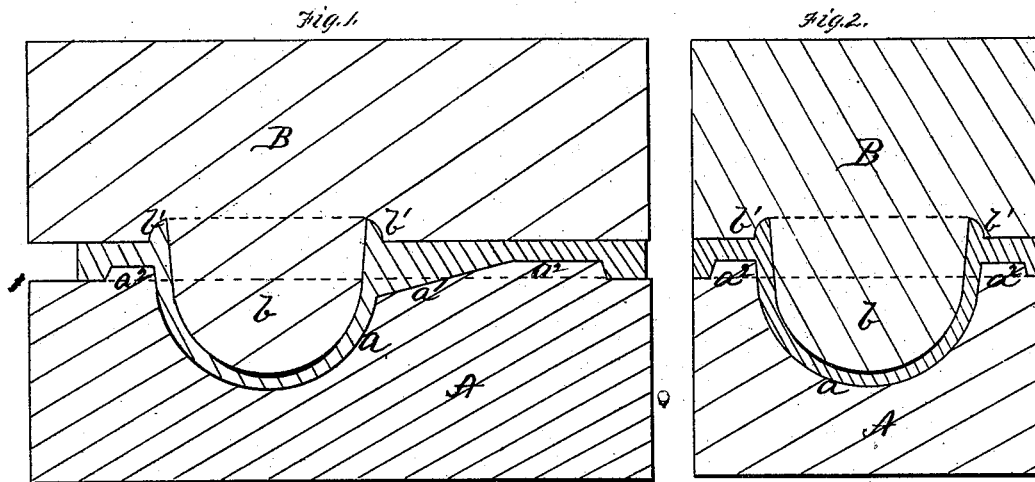


E. L. KEELER.  
 Manufacture of Hoes.

No. 212,233.

Patented Feb. 11, 1879.



WITNESSES.

R. W. Fenshall  
 John H. Smith

Fig. 6.

INVENTOR.

Edward L. Keeler

By Babcock & Kerr  
 Attys

# UNITED STATES PATENT OFFICE.

EDWARD L. KEELER, OF BEAVER FALLS, PENNSYLVANIA, ASSIGNOR TO  
JOSEPH GRAFF, OF SAME PLACE.

## IMPROVEMENT IN THE MANUFACTURE OF HOES.

Specification forming part of Letters Patent No. **212,233**, dated February 11, 1879; application filed  
November 1, 1877.

*To all whom it may concern:*

Be it known that I, EDWARD L. KEELER, of Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Hoes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of dies embodying my invention. Fig. 2 is a transverse section of the same. Figs. 3 and 4 are perspective views of the dies. Fig. 5 is a sectional view of the blank formed by the dies, and Fig. 6 is a face view of the blank.

Like letters refer to like parts wherever they occur.

My invention relates to improvements in blanks for the production of hoes and in the construction of dies for producing the same; and consists, first, in a blank, the eye of which is surrounded by a depression or groove to facilitate the subsequent plating of the blank; secondly, in so shaping the dies or plunger and mandrel that the metal of the blank is forced or drawn up around the plunger, forming an annular collar on the blank, which insures a square full shoulder in the finished article; thirdly, in providing the die or matrix thereof with a shoulder or annular projection, which works the metal back from the eye of the blank, so as to facilitate the subsequent plating of the blade; fourthly, in a blank for forming hoes, said blank having an annular rib or bead surrounding the eye, and adapted to fill out the shoulder in the subsequent working of the blank.

In the manufacture of hoes or blanks therefor by means of dies and from flat plates of metal wherein the eye is drawn or set up by the dies, the tendency of the metal to buckle or bend as it is drawn or forced up by the dome-shaped plunger results in a defective eye instead of the desirable square full shoulder, and the difficulty of working close around the raised eye in plating out the hoe from the blank reduces the quality and appearance of the finished article and increases its cost.

The object of the present invention, which is an improvement on Letters Patent No. 184,468, granted to Joseph Graff November 1, 1876, is to overcome the specified difficulties, and in such manner that the finished article has the quality and appearance of hand-work.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates the lower die-block, provided with a cavity or matrix, *a*, of the general outline (round, oval, or other cross-section) required for the eye of the hoe, and connecting therewith is a shallow triangular cavity, *a*<sup>1</sup>, adapted to form a rib or bead on the blank.

On the face of the die-block A, and surrounding, or partially surrounding, cavity *a*, is a ridge or projection, *a*<sup>2</sup>, adapted to swage the metal around the raised eye of a blank, so as to form a groove or channel thereon.

B represents the upper die-block, provided with a dome-shaped projection or plunger, *b*, whose general shape conforms to that of cavity *a* in the lower die-block.

The dimensions of the plunger or male die *b* with relation to cavity *a* are such that it will approach nearer to the bottom of the cavity than to the sides thereof, so as to force the metal of the blank from the center up the sides; and in order to accommodate, restrict, and shape the metal thus displaced an annular groove or recess, *b*<sup>1</sup>, is formed in the face of die-block B around the plunger *b*, substantially as shown; but such annular cavity is not necessarily intended to form a bead, as any shape of the die which will allow the metal displaced from the cup to square up the shoulder will suffice.

Dies having the characteristics specified may be employed in a drop-press or rolls; but if employed in rolls the dies will be modified somewhat in outline to meet the well-known requirements of dies so placed and used. The characteristic features will remain unchanged.

The dies being suitably mounted their operation is as follows: A plate of proper dimensions for the blank required is heated and ad-

justed on the lower die-block, A. The die-block B, with abruptly-tapered or dome-shaped plunger *b*, is then brought into action, forcing the metal into cavity *a* until the lower surface of *b* approaches the bottom of cavity *a*, when it thins the metal at the bottom of the cup *c* made in the plate, forcing the surplus metal up out of cavity *a* to square or fill out the shoulder, or forces it into the annular groove *b'*, as the case may be, which encircles the plunger, and producing the annular projection *c'*, surrounding the cup *c* of the blank. At the same time the ridge *a<sup>2</sup>* of die-block A has displaced the metal in the blank, so as to form depression *d*, and in so doing has materially assisted the plunger *b* to fill annular cavity *b'*, thus producing a blank similar to what is shown in Figs. 5 and 6. This blank may be subsequently finished by punching a hole in the center or thinned portion of cup *c*, opening out the eye by the tapering plunger spoken of in the recited Letters Patent, and plating and trimming by means well known in the art, or by any other of the approved methods adapted to the desired end.

The ridge *a<sup>2</sup>* may be on either die, as it is not material on which face of the blank the groove *d* is formed.

The advantages derived from my invention are that the metal is thrown up outside the eye of the blank, so as to insure a full square shoulder in the finished article, and is displaced

around the raised portion of the eye, so that the blade can be readily plated under the hammer.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a die for the manufacture of hoes and similar blanks, the taper or dome-shaped plunger surrounded by the annular recess, in combination with the cup-cavity in the corresponding die, substantially as and for the purpose specified.

2. The combination of the plunger and cup-dies, one of said dies provided with a ridge for forming the depressions around the eye of the blank, substantially as specified.

3. The blank for forming hoes herein described, having the cup-cavity surrounded by a depression to facilitate the subsequent plating of the blank.

4. The blank for forming hoes, having an annular rib or bead surrounding the eye, and adapted to fill out the shoulder in the subsequent working of the blank, substantially as described.

In testimony whereof I, the said EDWARD L. KEELER, have hereunto set my hand.

EDWARD L. KEELER.

Witnesses:

R. C. WRENSHALL,  
FRANK W. SMITH.