

L. CHAPMAN.

DIES AND PUNCHES FOR FORMING THE EYES OF ADZES.
No. 172,255.

Patented Jan. 18, 1876.

fig. 1.

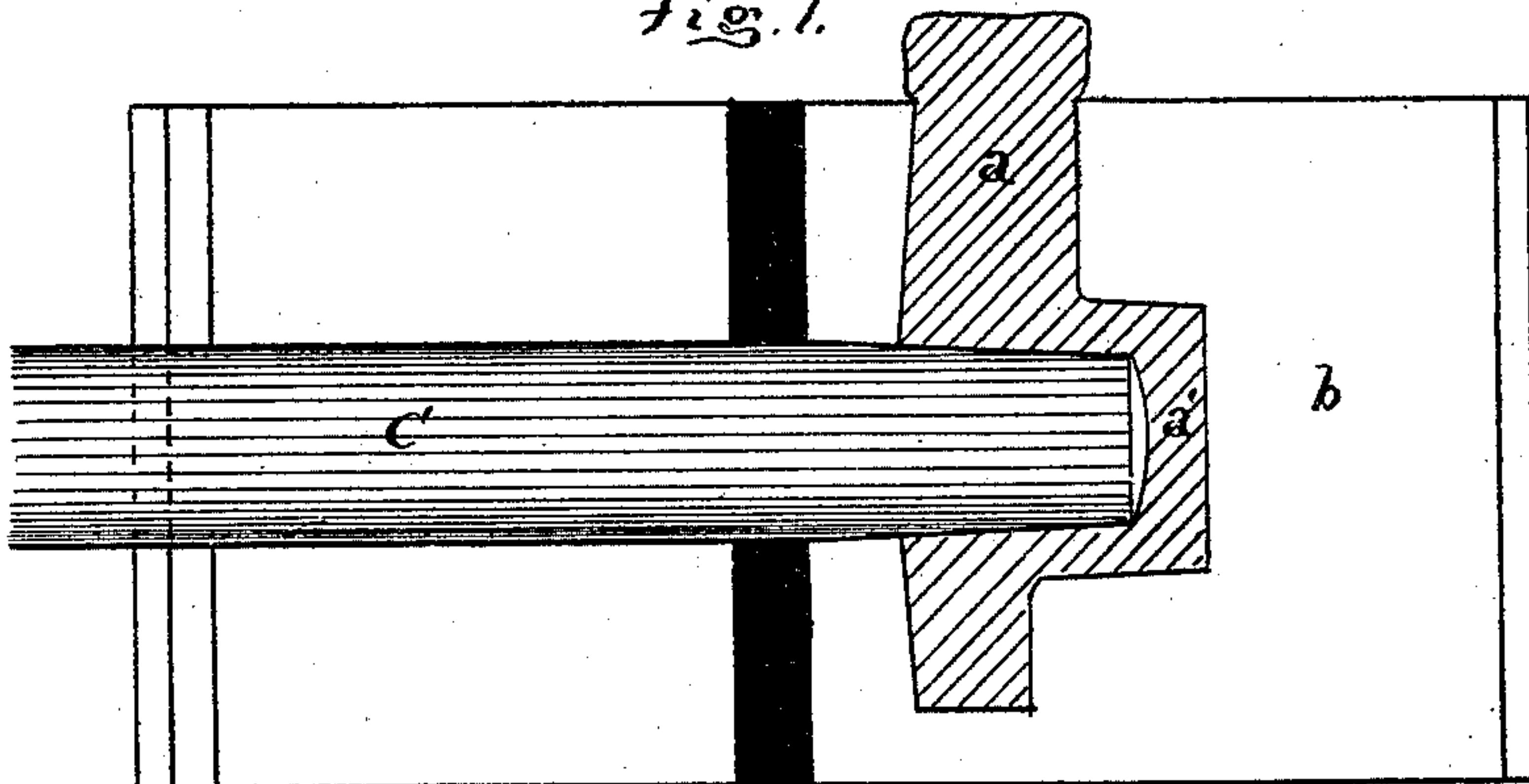


fig. 6

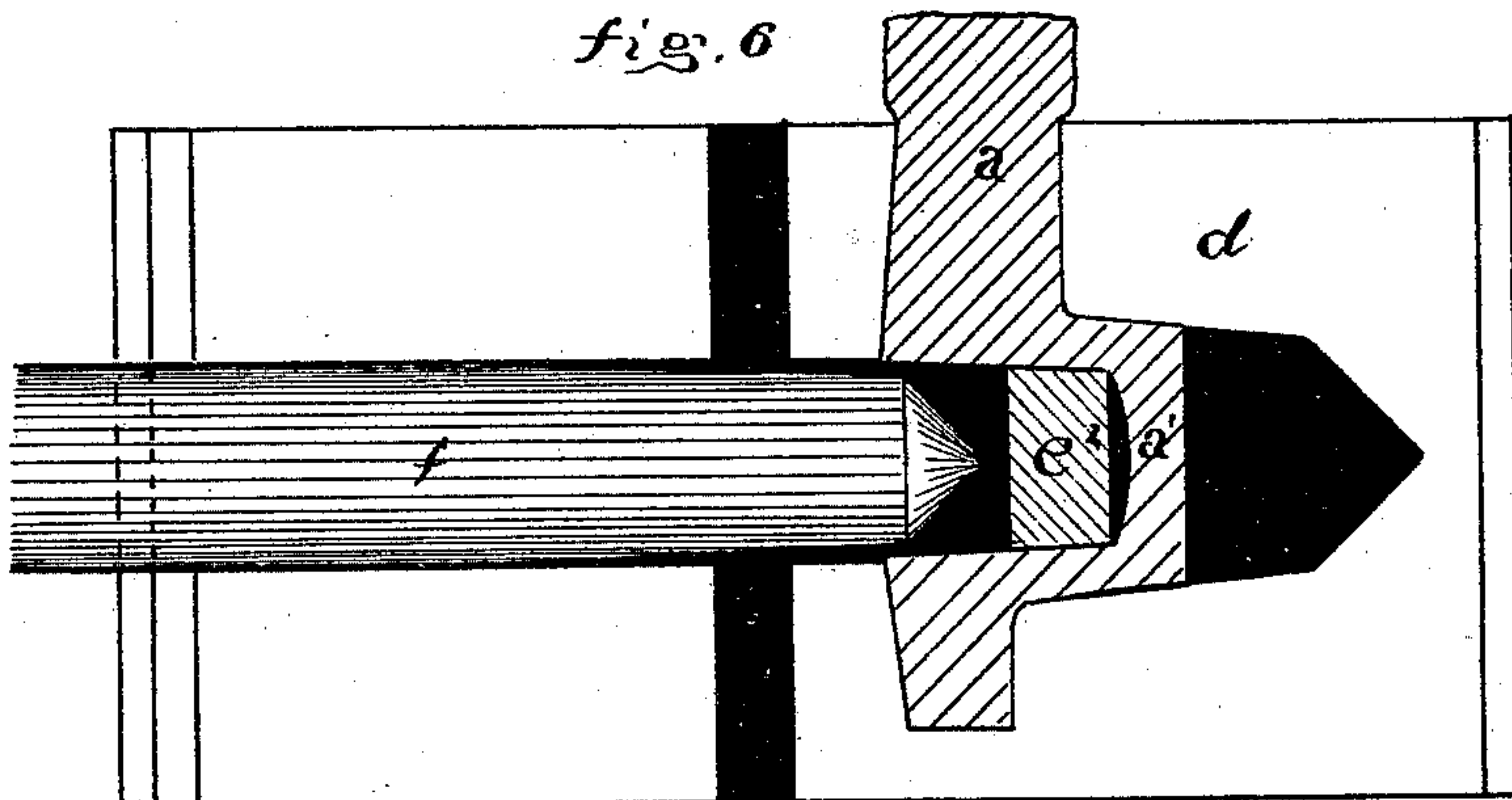
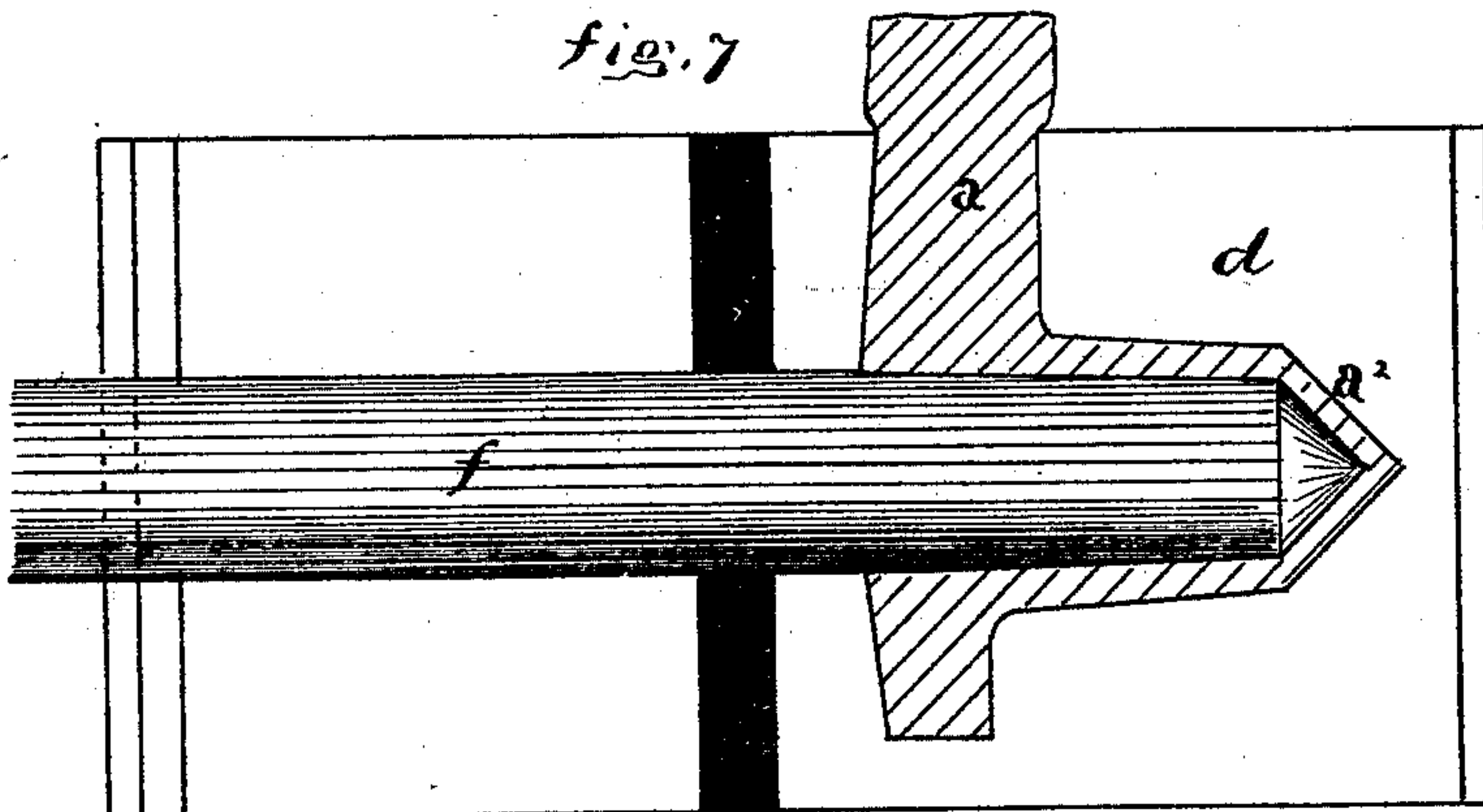


fig. 7



Witnesses.

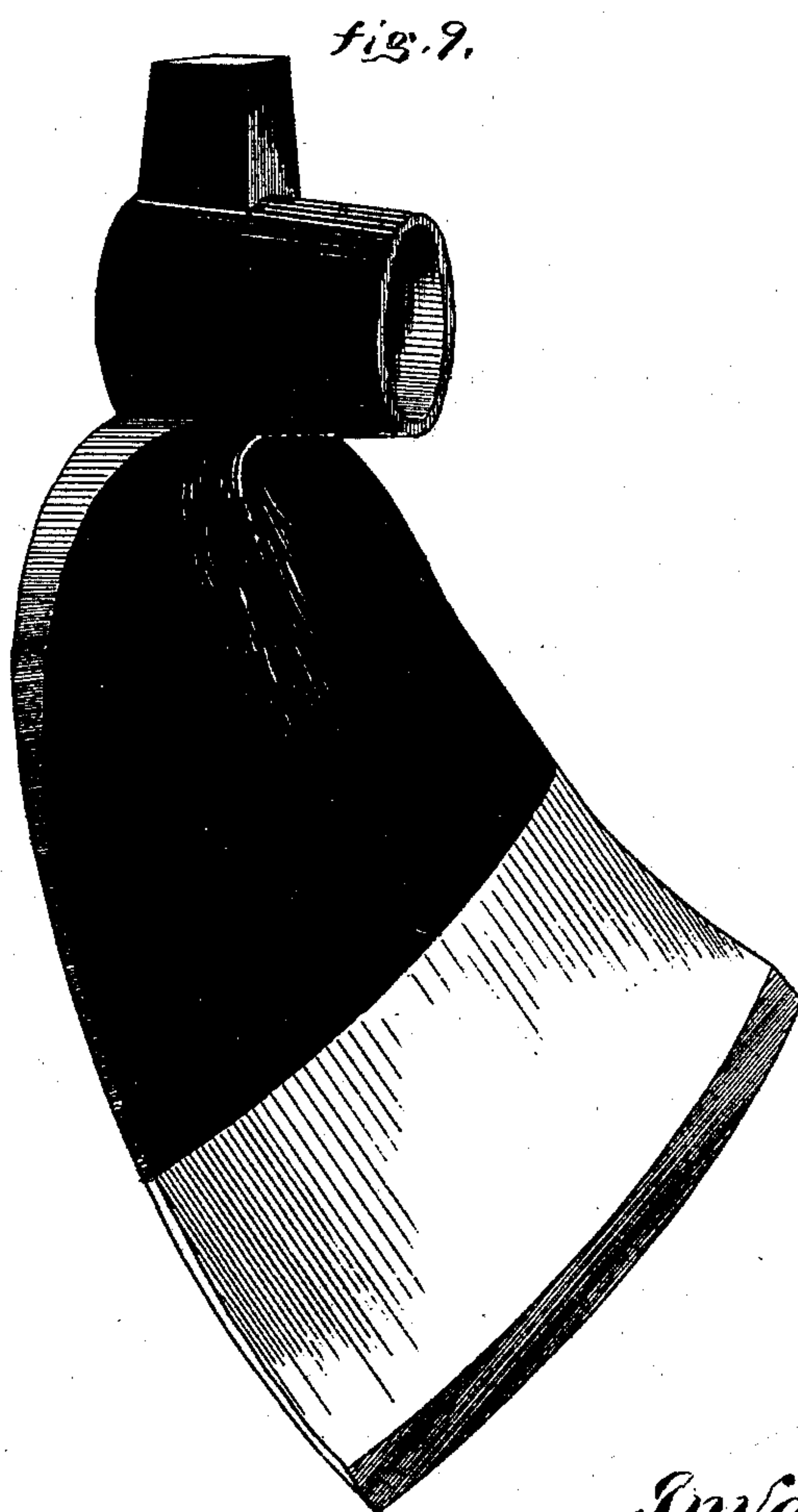
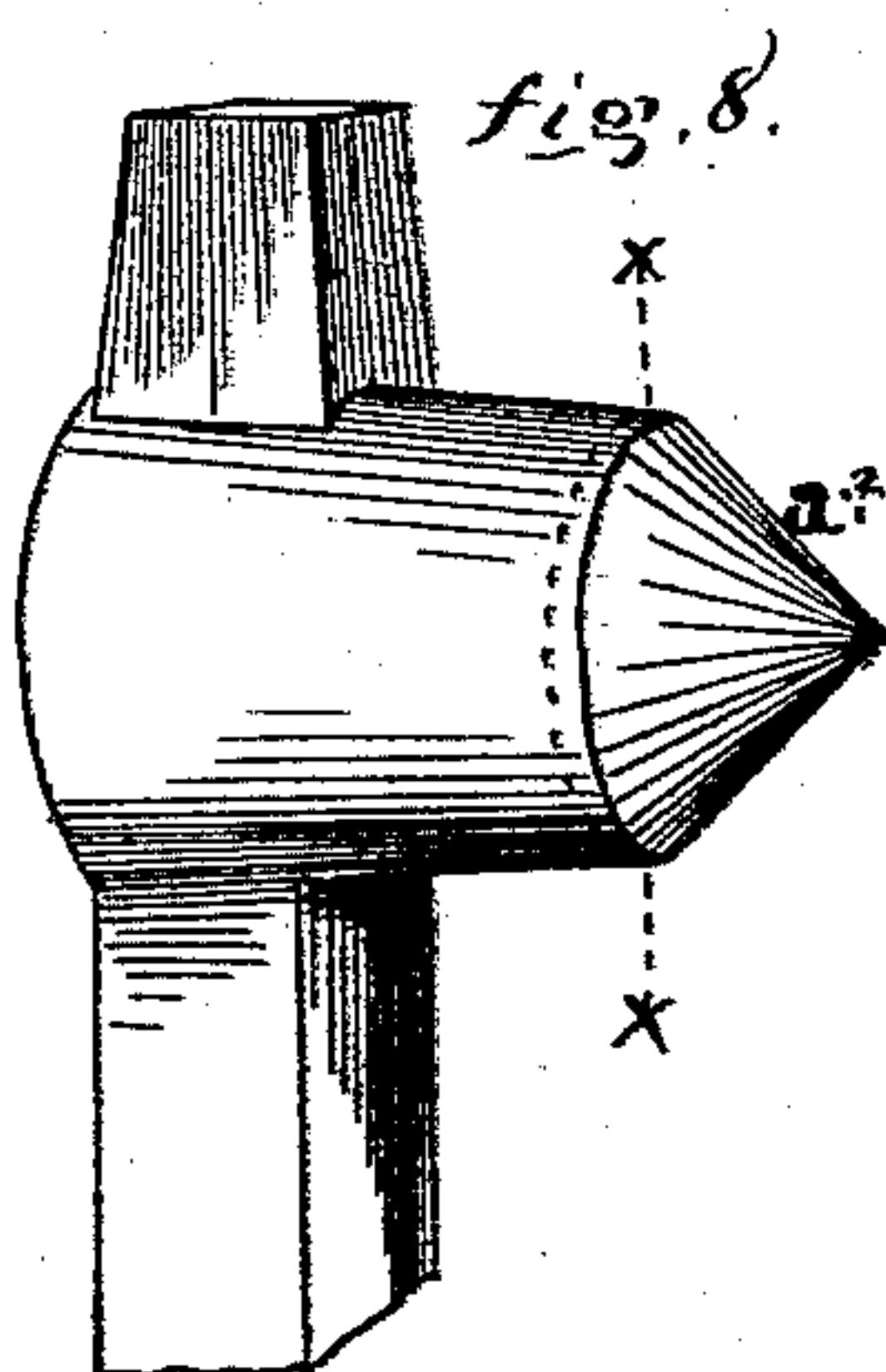
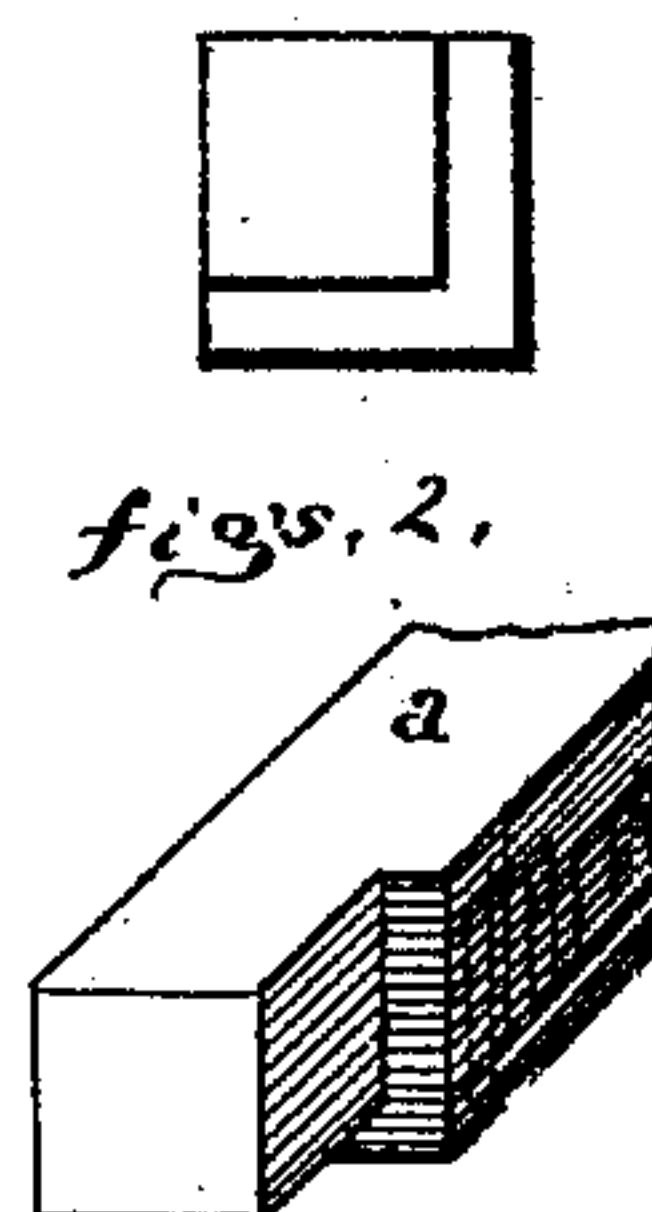
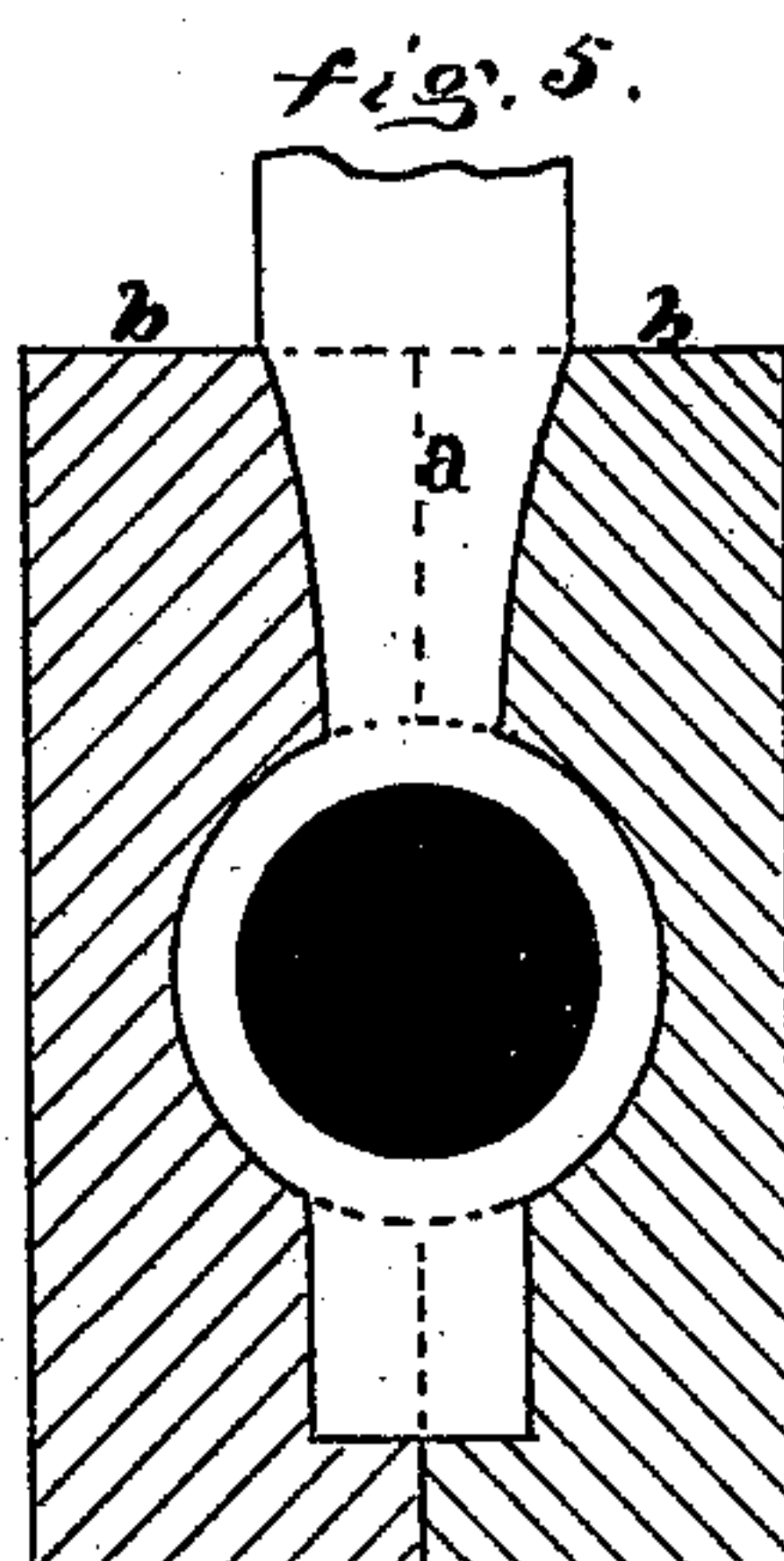
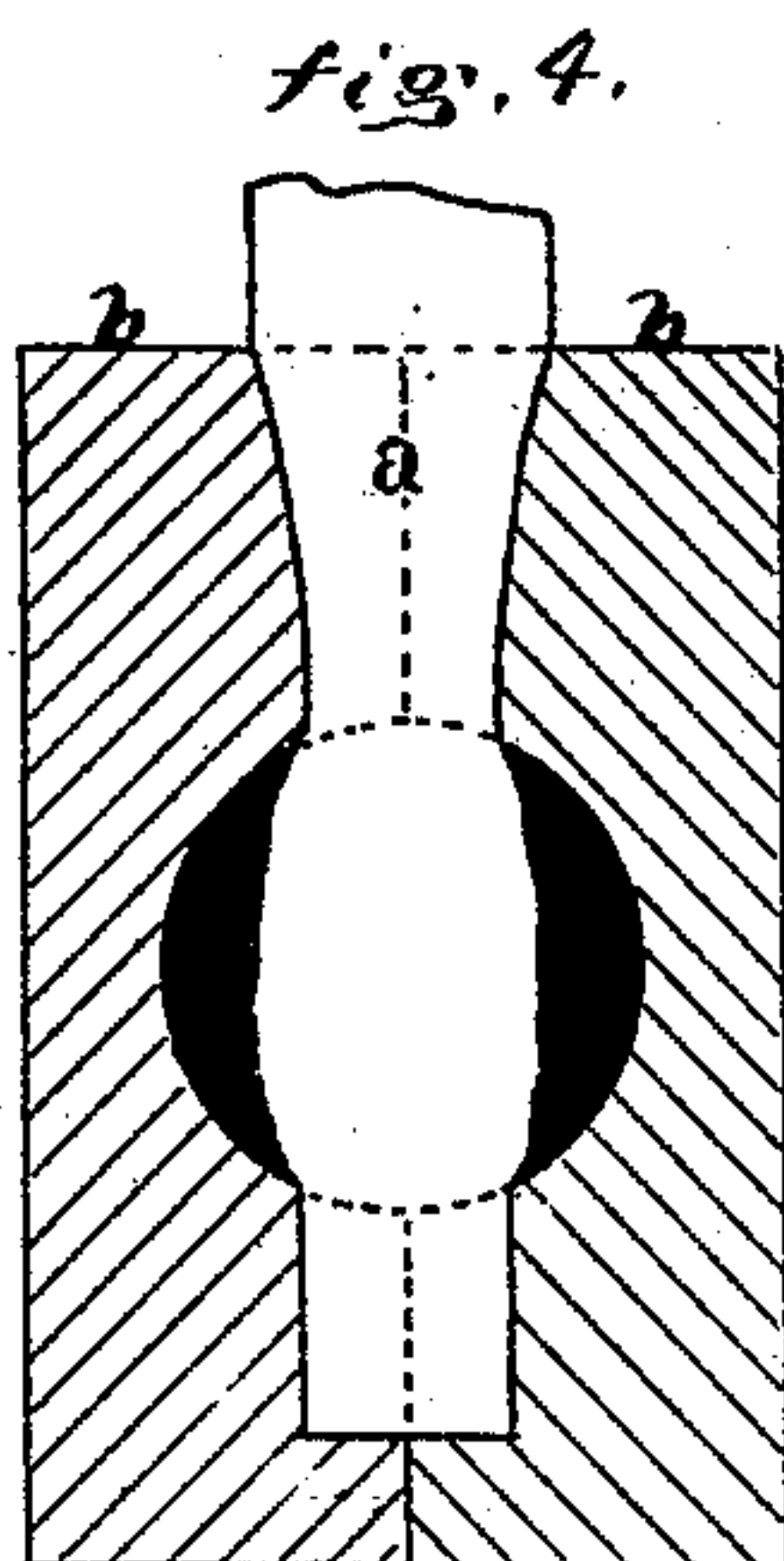
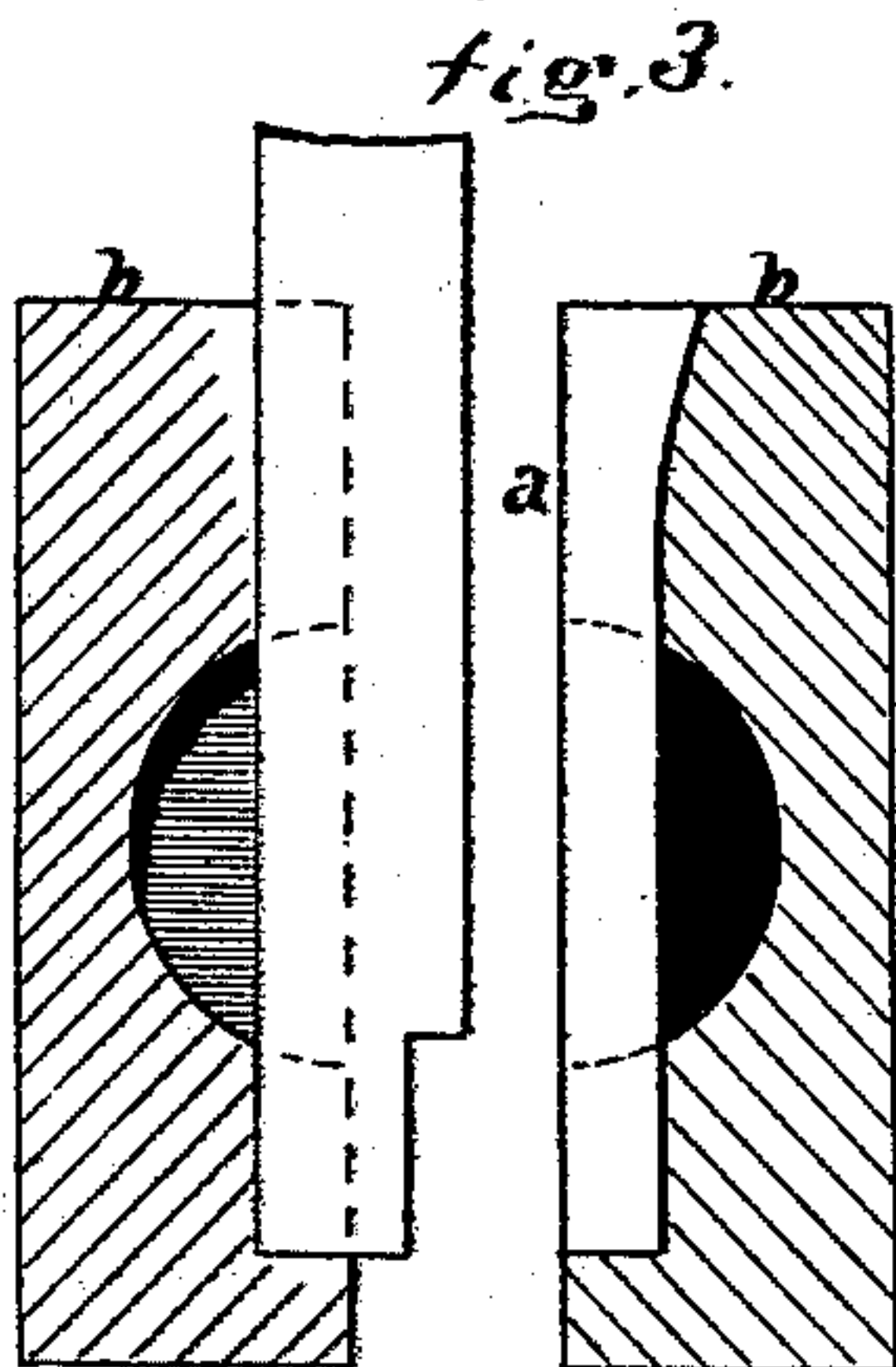
John Pollitt
George E. Nolan

Inventor.

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By W. E. Simonds
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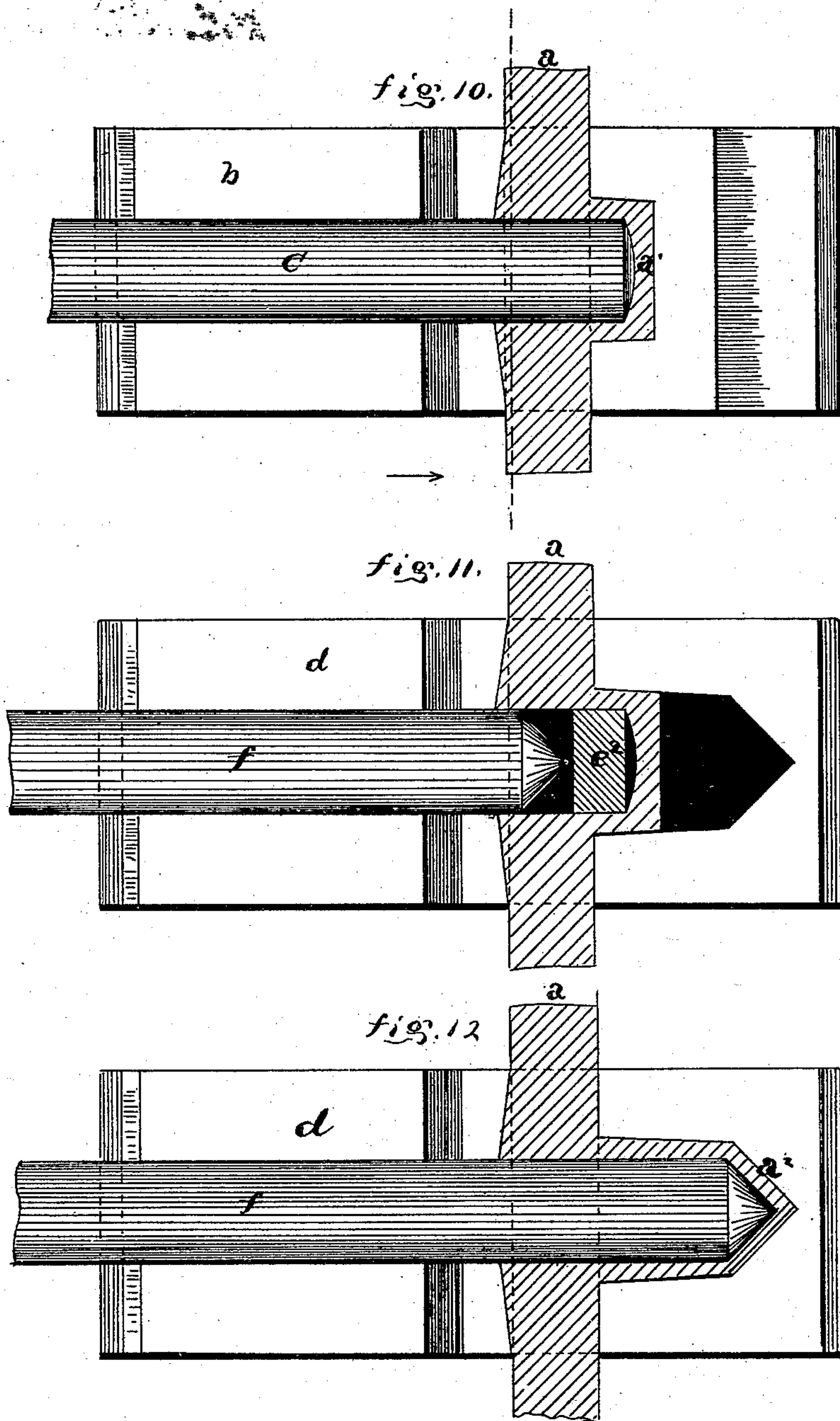
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UNITED STATES PATENT OFFICE

LUKE CHAPMAN, OF COLLINSVILLE, CONNECTICUT, ASSIGNOR TO THE
COLLINS COMPANY, OF SAME PLACE.

IMPROVEMENT IN DIES AND PUNCHES FOR FORMING THE EYES OF ADZES.

Specification forming part of Letters Patent No. **172,255**, dated January 13, 1876; application filed
February 24, 1875.

CASE B.

To all whom it may concern:

Be it known that I, LUKE CHAPMAN, of Collinsville, in the county of Hartford and State of Connecticut, have invented certain new and useful improvements pertaining to the manufacture of elongated eyes, circular or oval, in cross-section, for adzes and other tools and articles having similar elongated eyes, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a face view of one of the two duplicate dies forming the first set, showing a longitudinal section of the bar or stock as operated upon. Fig. 2 is a view of the end of the stock-bar as prepared for operation in the first set of dies. Fig. 3 is a view in cross-section of the first set of dies, showing the bar inserted ready to commence operations. Fig. 4 is a view similar to Fig. 3, except that the dies have closed together. Fig. 5 is a view similar to Fig. 4, except that the punch has moved down and done its work the same as in Fig. 1. Fig. 6 is a face view of one of the two duplicate dies forming the second set, showing the product of the first set inserted ready to be operated upon. Fig. 7 is a view similar to Fig. 6, except that the punch has advanced and done its work. Fig. 8 is a view of the product of the second set of dies. Fig. 9 is a view of the completed adze.

These dies are designed for forming elongated eyes, round or oval, in cross-section, for adzes or other tools or articles having similar eyes. Such tools and articles are usually made of iron, or steel, or iron and steel. The metal bar or stock to be operated upon is properly heated previous to manipulation.

The bar of metal *a*, of proper size, is first cut into proper lengths, and one end prepared as shown in Figs. 2 and 3. The bar is then heated and inserted as shown in Fig. 3. The dies *b b*, worked by appropriate machinery, now close together face to face, as shown in Fig. 4, pinching the bar. The punch *c* now advances and does its work, as shown in Fig. 5, causing the metal to fill the matrix of the dies, and leaving the web *a'* just forward or in front of the punch. The eye is so far as

formed circular in cross-section (though it may as well be made oval, if desired.) The punch now retreats, the dies open, and the stock is taken out. It is again heated and grasped by the second set of dies *d d*, (which, being duplicates, only one of them is shown in the drawings, and that in Figs. 6 and 7, the cross-section of which is precisely similar to Figs. 4 and 5,) which close together face to face. Into the hole formed by the punch *c* is dropped the additional stock-piece *e*² before the stock or bar is submitted to the second set of dies. The punch *f* now advances to its work, as shown in Fig. 7, merging the piece *e*² in the stock and fully elongating the eye. The product of the second set of dies is shown in Fig. 8. The cap-web *a*² is now removed on the line *x x*, and the forging of the eye is substantially completed. This forging is finally worked into the finished shape shown in Fig. 9.

It is perfectly obvious that this process and these dies are applicable, by obvious changes, to the production of oval or circular sectioned elongated eyes for other tools and articles than adzes, and I introduce Figs. 10, 11, and 12 to illustrate their application to the production of circular-sectioned elongated eyes for pickaxes. Fig. 10 is a face view of one of the first set of dies with a longitudinal section of the stock, the punch having done its work. Fig. 11 shows a face view of one of the second set of dies, with the product of the first set inserted, (with the additional stock-piece,) and the punch ready to do its work. Fig. 12 is the same as Fig. 11, except that the punch has advanced and done its work.

I am well aware that iron and steel have been punched, placed, and pressed into various forms previous to this date; but the flow of these metals under compression or concussion (in dies) cannot by any rules so far stated be determined in advance of actual trials, and these dies of mine differ from previous dies by just that difference which makes my dies to work well in practice.

The blank is made smallest at one end before submission to the dies, so as to have this part of about the same size as the head of the tool, which it finally forms, while the body

of the blank is larger, in order to afford the requisite amount of stock for the eye. This small part at the end can be left in the center of the bar, its place in the dies being correspondingly located, if desired; but I prefer it upon one side of the bar for two reasons: first, by appliances that I have in use it is easier to make it thus; and, second, when the small part is made centrally of the bar I find an increased tendency in the metal to flow out between the dies at the joint, under the action of the punch. It is true that by this method, which I prefer, the metal is thrown slightly out of its axial center in the matrix of the dies, but this proves to be of no consequence in actual practice.

I have other patents, or intend so to have, of even date herewith, one marked "Case D" and another marked "Case E." The dies and punches shown and described in the former case are for making a solid head adz-eye, and differ from these herein described, which are

for making a common oval or round adz-eye in the shapes of the matrices of the dies and in the shapes of the punches; also, the herein-described dies and punches differ in shape from those shown and described in "Case E," which are designed for making eyes for hoes. In neither Case D nor E does the shape of the die require that the stock be made smaller at one end before action. Case D further differs from this case in showing a cutting-off shoulder wholly absent in these dies herein described.

I claim as my invention—

The combination of the dies *b b* and punches *c* with the dies *d d* and punch *f*, when all are constructed, arranged, and designed for operation and use, substantially as shown and described.

LUKE CHAPMAN.

Witnesses:

WM. EDGAR SIMOND,
GEORGE E. NOLAN.