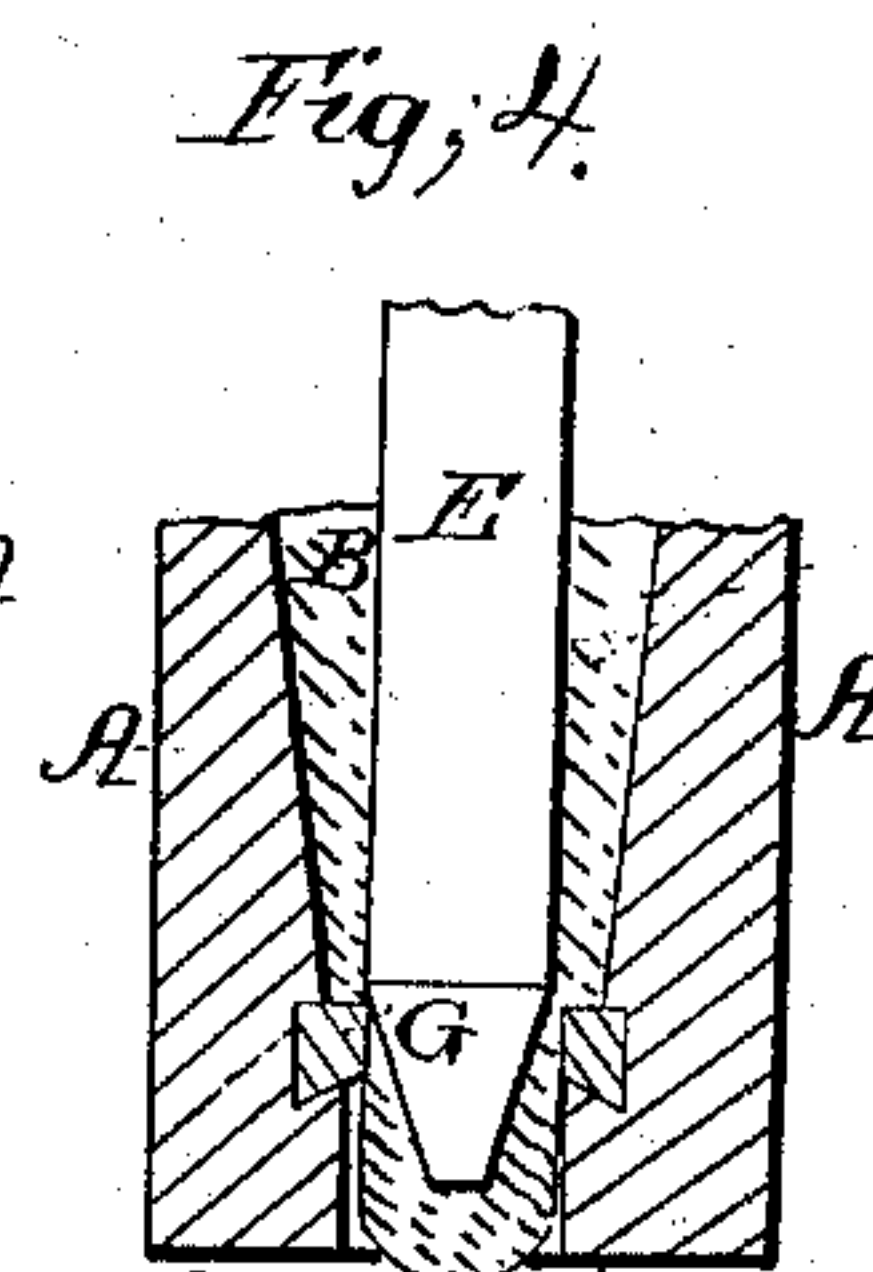
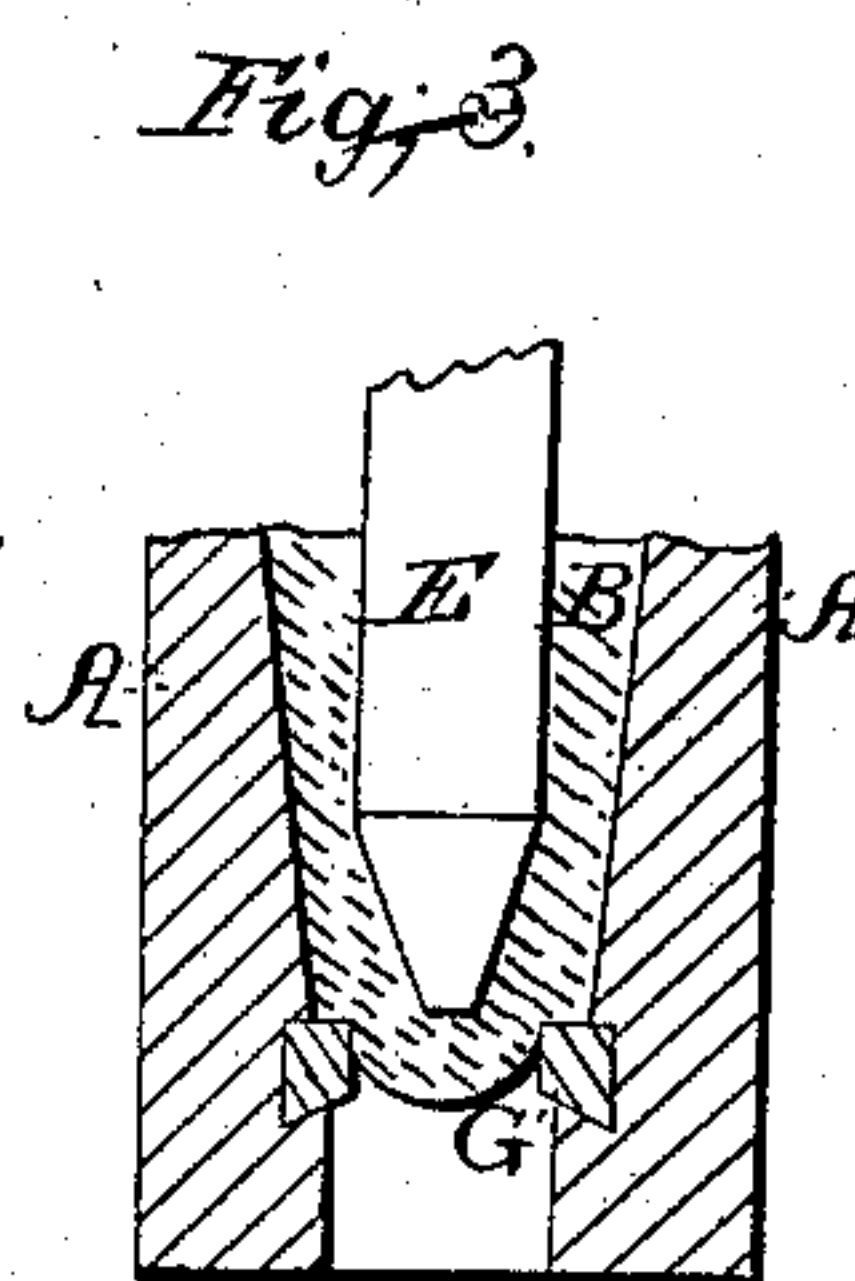
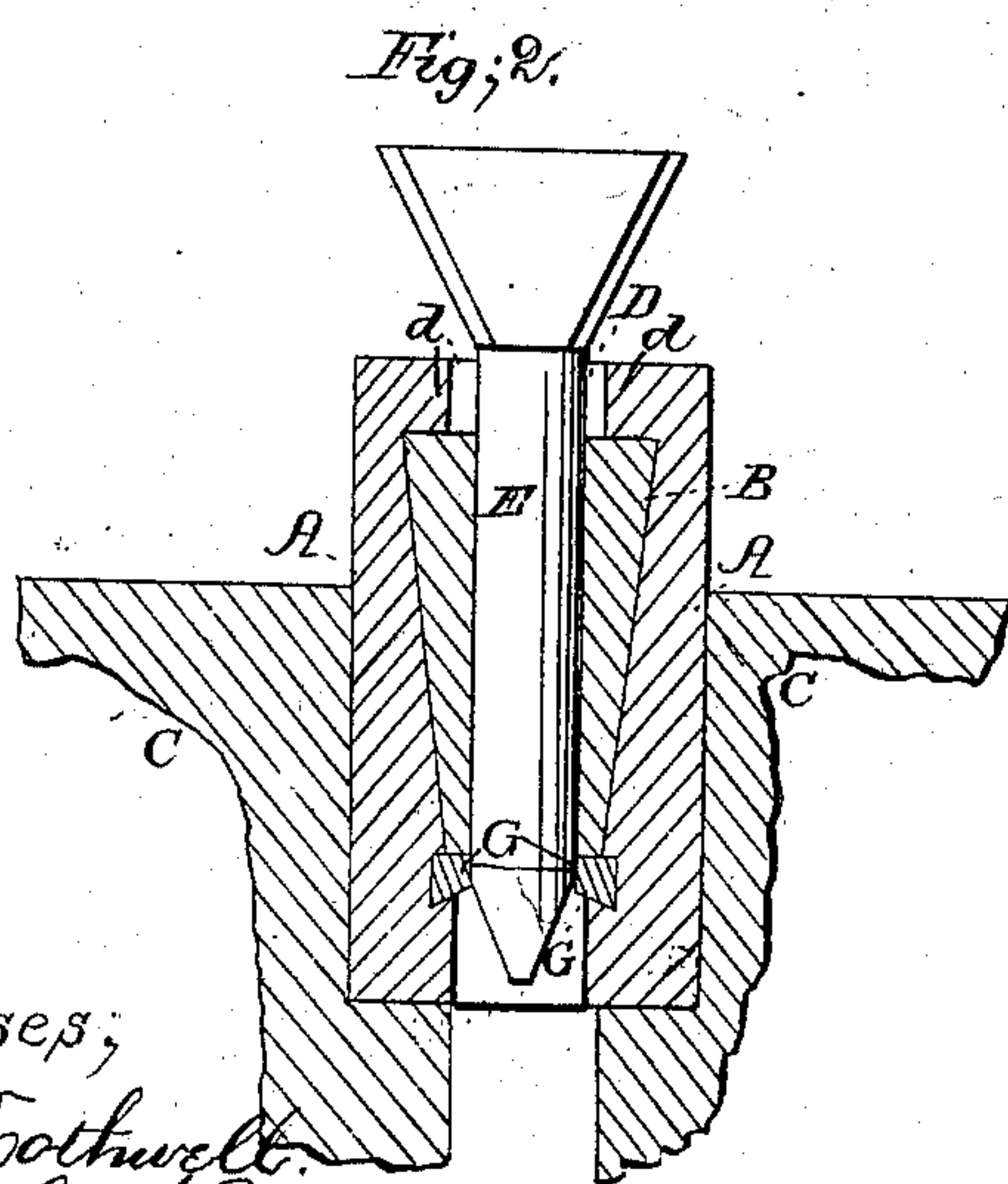
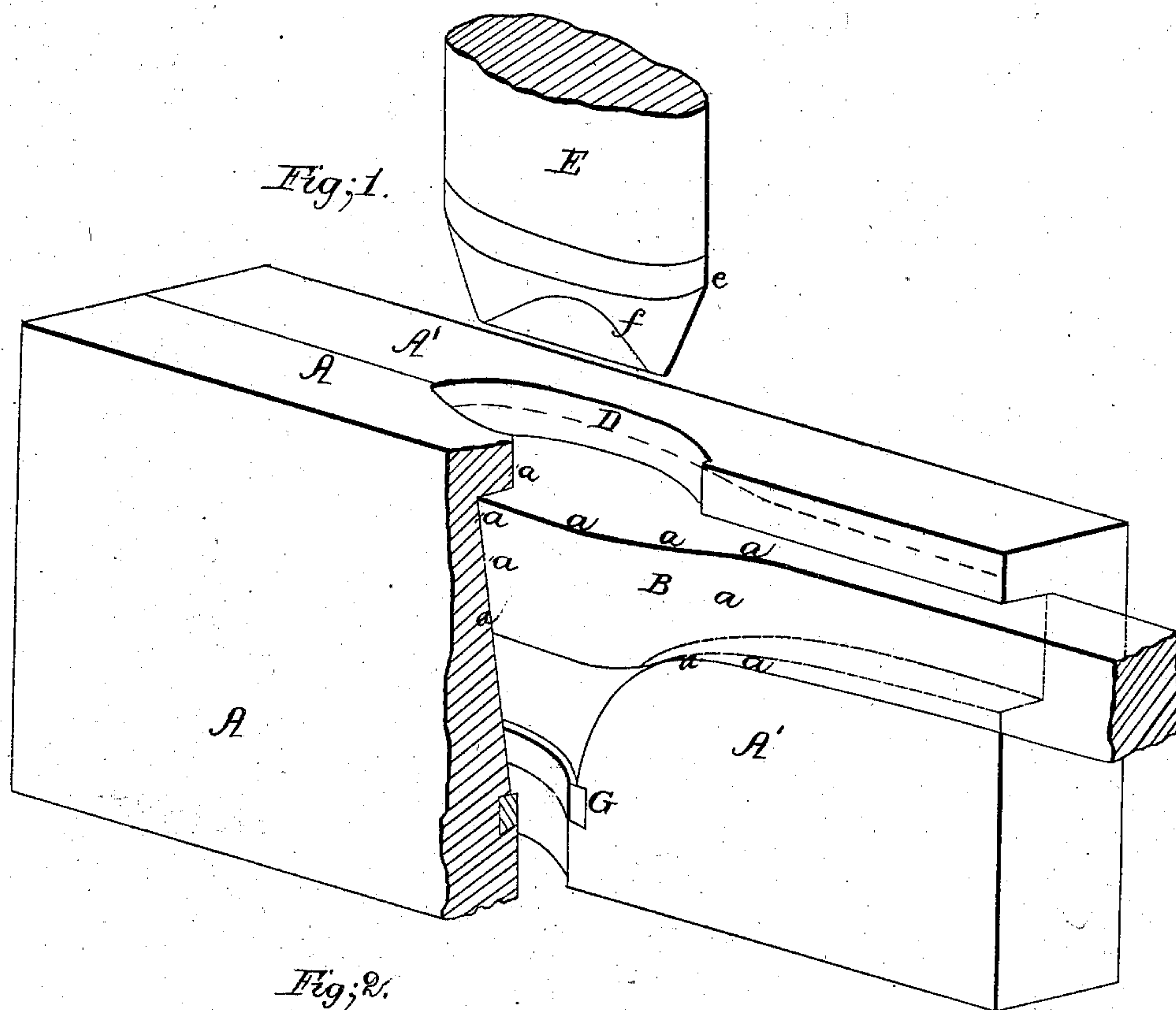


H. M. HAMILTON.  
DIE FOR FORMING THE EYES OF PICKS.

No. 68,187.

Patented Aug. 27, 1867.



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# United States Patent Office.

HENRY M. HAMILTON, OF NEW YORK, N. Y.

Letters Patent No. 68,187, dated August 27, 1867.

## IMPROVED DIES FOR FORMING THE EYES OF PICKS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, H. M. HAMILTON, of the city, county, and State of New York, have invented a new and improved Die and Punch for Forming Elongated Eyes of Tools; and I do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable one skilled in the art to which the invention appertains to make use of it, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view with a portion of the die removed.

Figure 2 is a transverse section.

Figures 3 and 4 are diagram sections illustrating the operation.

The die is formed of two parts, the opening therein corresponding to the required external conformation of the head of the tool. The blank of hot metal placed in the die does not fully occupy the cavity; but the punch which forms the eye thrusts the metal forward, and makes the raised or elongated eye.

The rim around the elongated end of the eye is formed by a chilled iron or steel flange or annular cutter in the die, the projection of the cutter from the face of the die corresponding to the thickness of the eye at its elongated end.

The punch has an entering edge to cleave its way through the metal, and a shoulder, which corresponds to the opening in the cutter. The shaft of the punch corresponds to the shape of the eye. The punch pushes the metal laterally and forward, and the shoulder, shearing against the cutter, removes superfluous metal.

The bulb or enlarged portion of the metal blank, when placed in the die, fully occupies the upper portion (as represented) of the die, being tightly clasped between the dies, and also between the rounded shoulder and upper flange, so that the punch on entering does not mar the shape by bending the blank or causing it to sag away from the upper surfaces; but, the blank being firmly held, the punch enters, and its conical portion exerts a lateral pressure upon the metal, while the latter is also pushed before it and prolonged into an eye, which fills up the lower portion of the cavity of the die.

In the drawings, A A' are the two halves of the die, the cavity between them corresponding to the shape of a pick-head. These portions may be clasped together after the blank B is introduced by means of jaws C C, (fig. 2,) or in any other sufficient manner. At the upper part of the die is an opening, D, into which the punch E is introduced, the cutting face *f* cleaving its way through the red-hot metal of the blank B, forcing it laterally and downward, causing it to occupy the whole cavity. If the metal be somewhat in excess it will be forced forward through the cutter G, as seen in fig. 3; and, the punch continuing to descend, the shoulder *e* cuts it off against the cutter G, as seen in fig. 4, and the face or edge of the elongated eye receives its shape and finish from the inner face of the cavity of the die A A'.

When the metal is in exact quantity, as in fig. 2, it just fills the cavity. The punch is withdrawn after the eye is formed, the flanges *d d* pressing upon the upper side, keeping the blank down during this part of the operation.

It is not absolutely necessary that the upper surface shall be entirely enclosed, but mere projections may be sufficient to hold the pick down as the punch is withdrawn.

The blanks for this purpose may be made in a rolling-mill by forming a continuous bar of some length, with occasional swells or enlargements upon it, the lengths, when detached, possessing the required quantity of metal for the purpose, and in the right shape, for it is desirable, in the first place, that the metal shall be sufficient, when expanded by the punch, to fill the cavity and complete the elongation of the eye; and also that it shall be of such a size, when clasped by the cheeks of the die, that the entering punch shall pierce the middle, and not bend or displace it, except as it pushes the metal out below for the raised eye.

It will be manifest that if the bulb of the blank does not fully reach the sides, it may lack on one side only. The punch will then not strike the centre, and a failure will be the result. In practice it has also been found that when the bulb does not fill the die at the portions marked *a a a*, and their counterparts, the descending punch tends to bow in the upper surface, instead of cutting in and through, that is, pushes the blank out of shape at the place and time of contact, instead of cleaving through it, spreading the metal outwardly against all parts of the adjacent walls of the die, and prolonging the wave of iron it pushes before it into an elongation, the penetration of which by the punch forms it into an eye.



For the convenience of description I have called certain portions the upper side or lower side, respectively, intending to indicate it as shown in the drawing. I do not intend to indicate that any special position of the dies is necessary which would bring any particular side or portion uppermost. The die may be moved up or down to the punch, or, conversely, the punch may be moved to the die.

I have spoken of the possible substitution of projections on the upper side of the die in place of absolutely enclosing the blank on that side, as shown in the drawing, excepting at the punch-hole. I do not consider that the said substitution of the projecting points for an enclosing side will be so efficient or produce so good an effect as the perfect enclosure of the blank on the upper side. In the latter case the soft metal, being pressed by the entering punch, is forced against and conformed to the sides of the die, whereas it might protrude from the desired line of conformation between mere projections, and form knobs or swells, which would require removal subsequently.

I may elect to make the eye in the pick by the introduction of the punch from the other end of the eye; and, in that case, the blank will be made to fit the elongated portion, and the entering punch will, in its progress, force the metal towards what is shown in the drawing as the upper side. I do not prefer this mode, as the blank is more difficult of preparation, and is more likely to be "pinched" in the closing dies; but, should this mode of operation be adopted, the upper side of the die will become a necessity, as the soft metal is forced by the entering punch towards that side; and the perfect enclosure of the blank, except at the punch-hole, will give the desired conformation, the edge of the punch-hole acting as the cutter, in the course of operation, to cut off and remove the superfluous metal.

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

I claim the combination of the improved jaws A A', a divided cutter-ring, G, (either at the upper or lower side,) and a shouldered punch, E, operating substantially as described.

To the above specification of my improvement I have signed my hand this 14th of January, 1867.

H. M. HAMILTON.

Witnesses:

SOLON C. KEMON,  
GEO. W. ROTHWELL.