

*W. H. & G. W. Miller,*

*Manf. Cutlery.*

*No. 106,073.*

*Patented Aug 2, 1870.*

FIG. 1

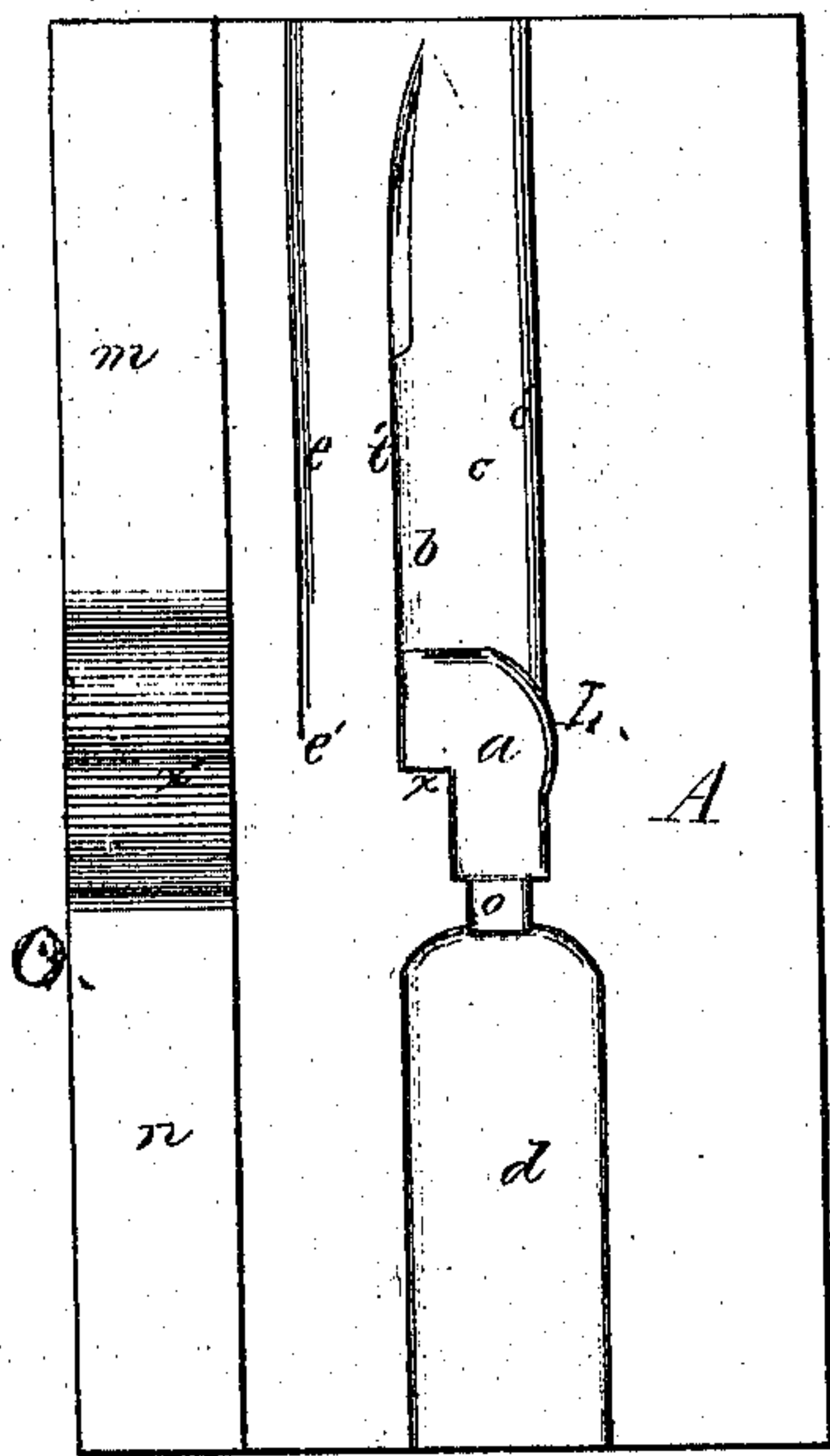


FIG. 4

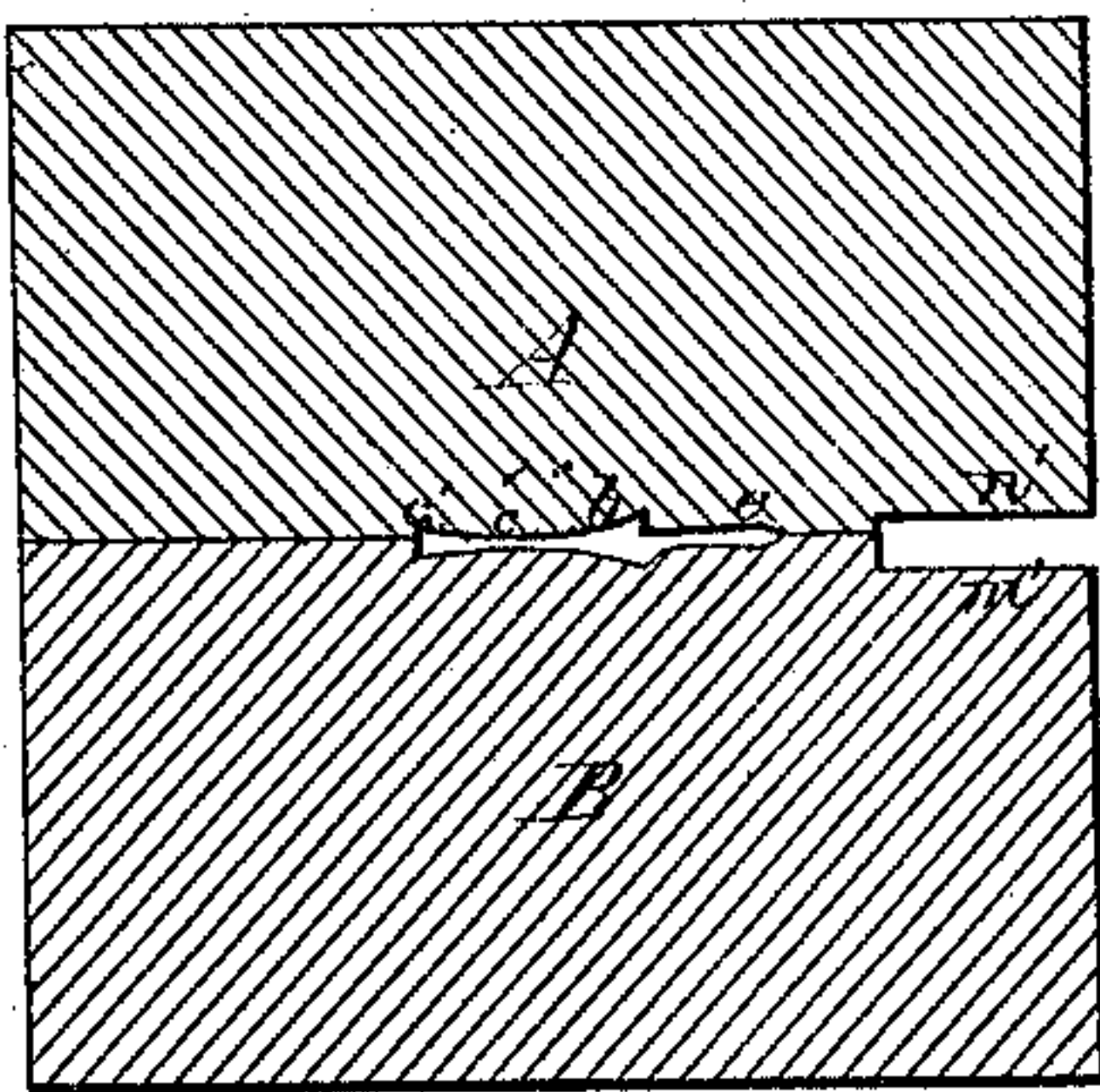


FIG. 2

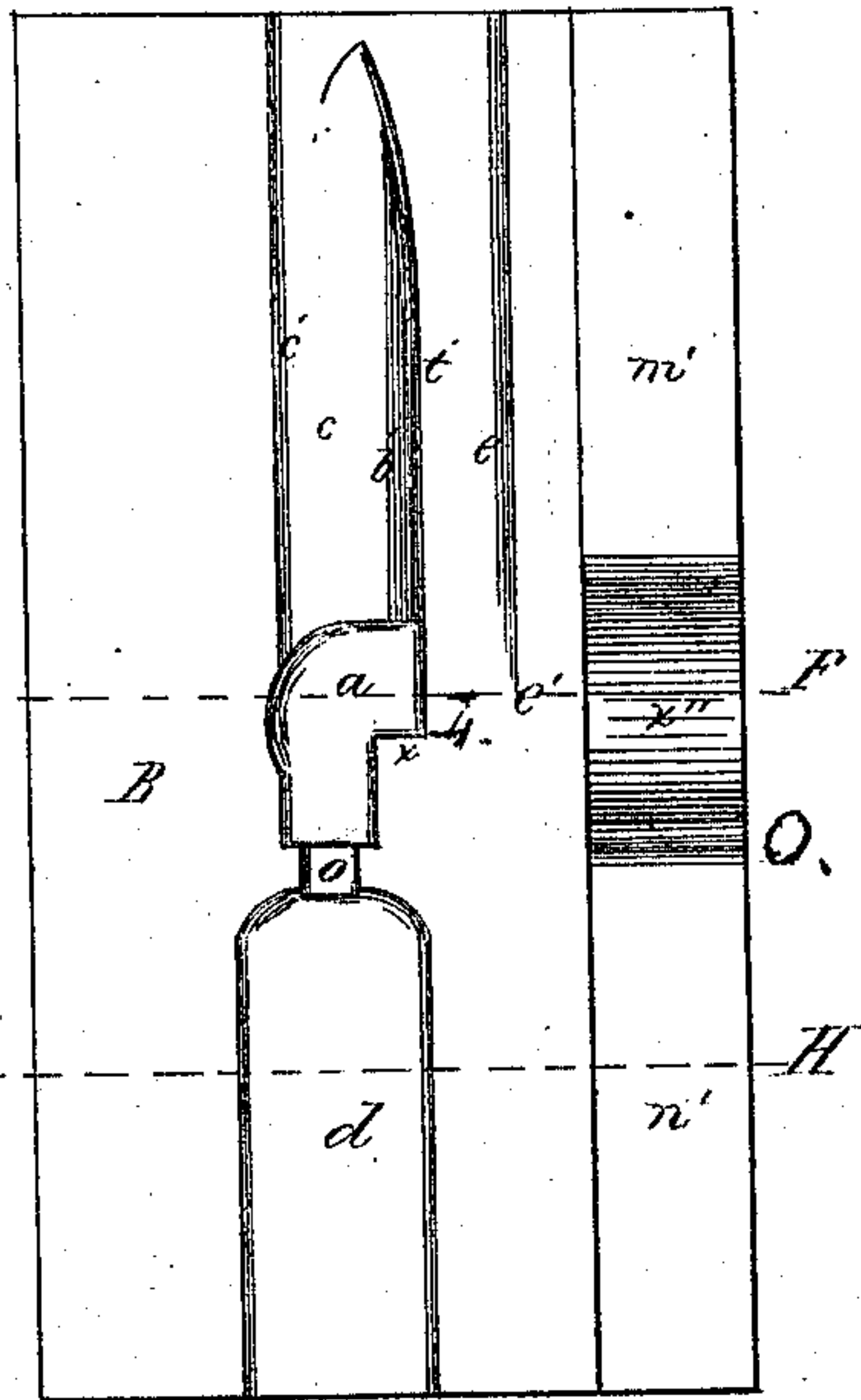


FIG. 7

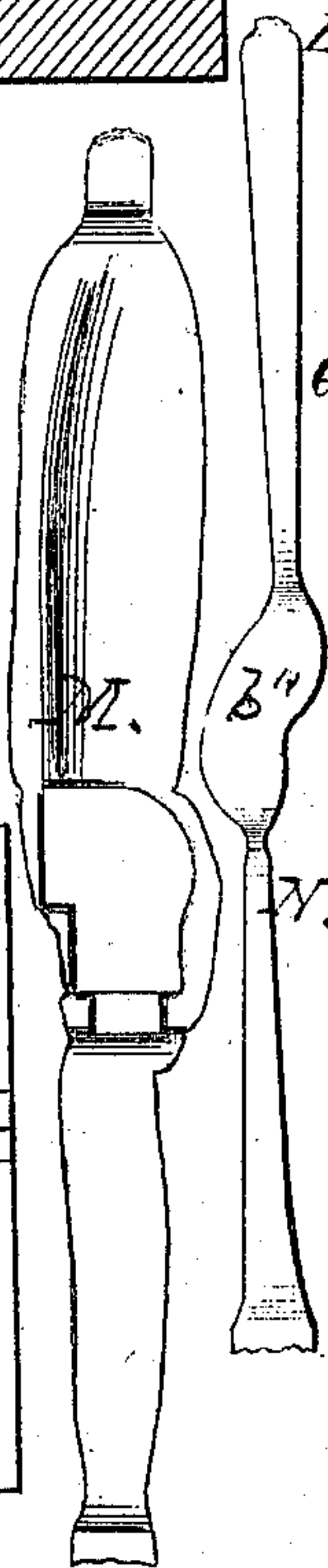


FIG. 3

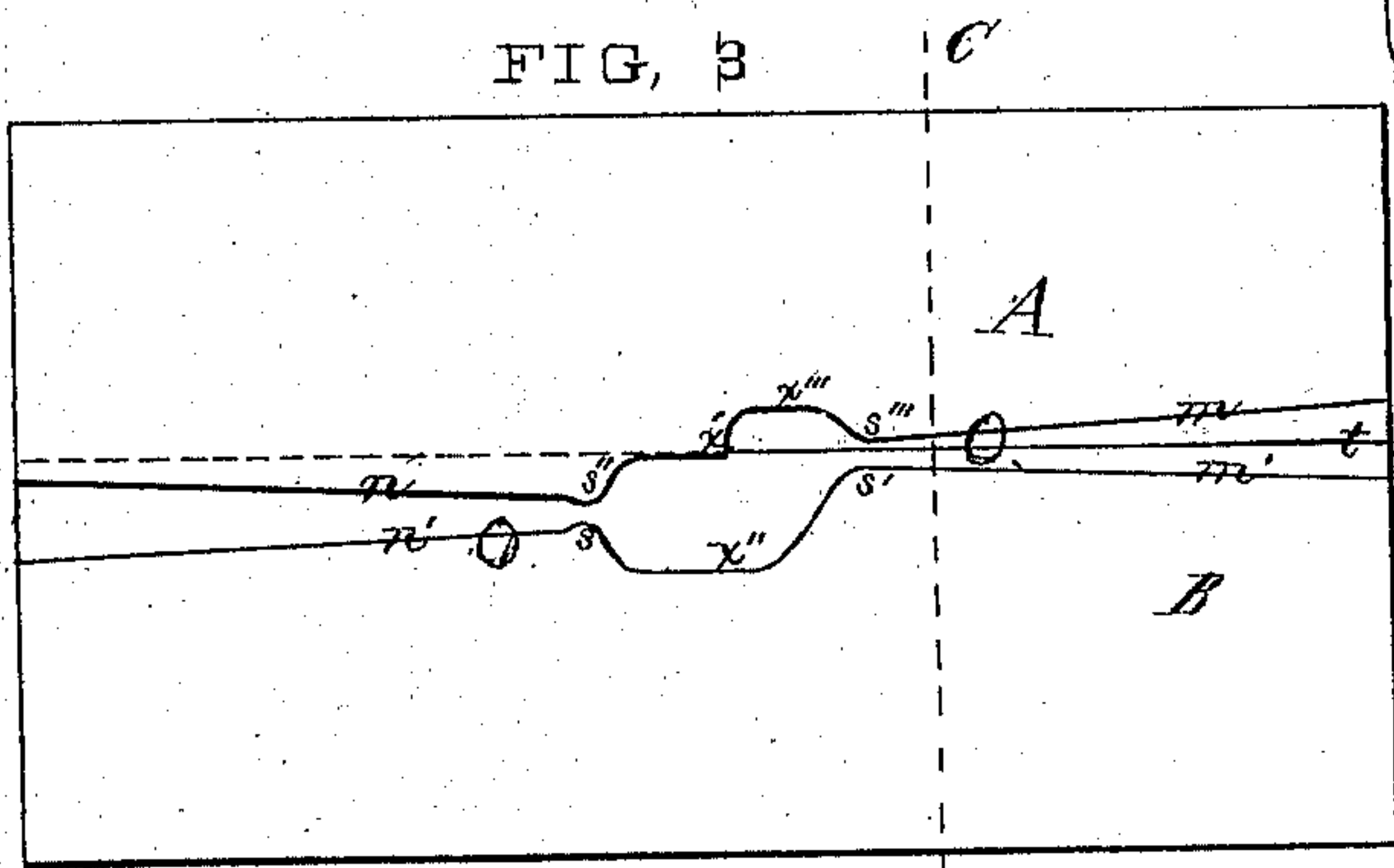


FIG. 5

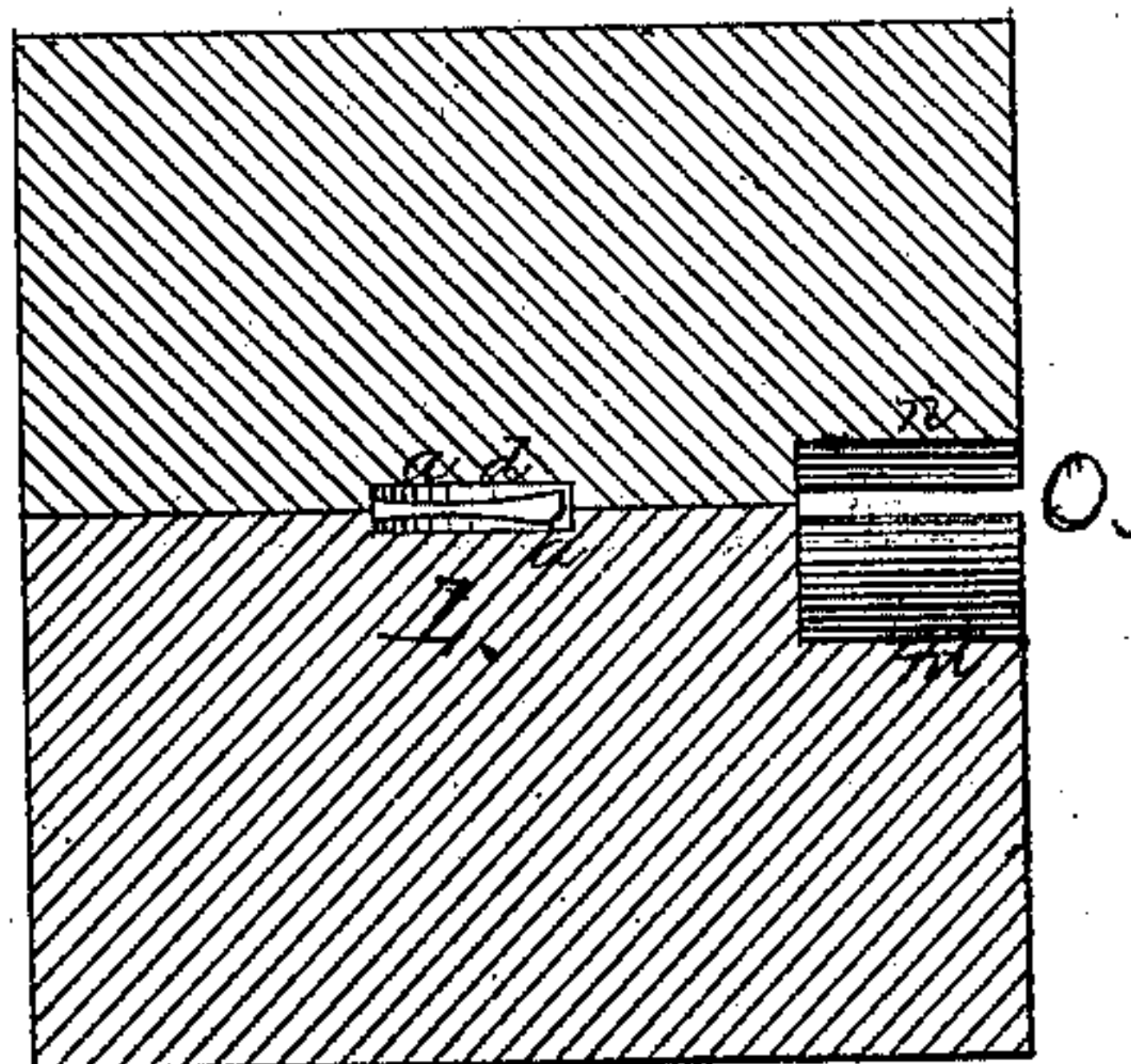


FIG. 8

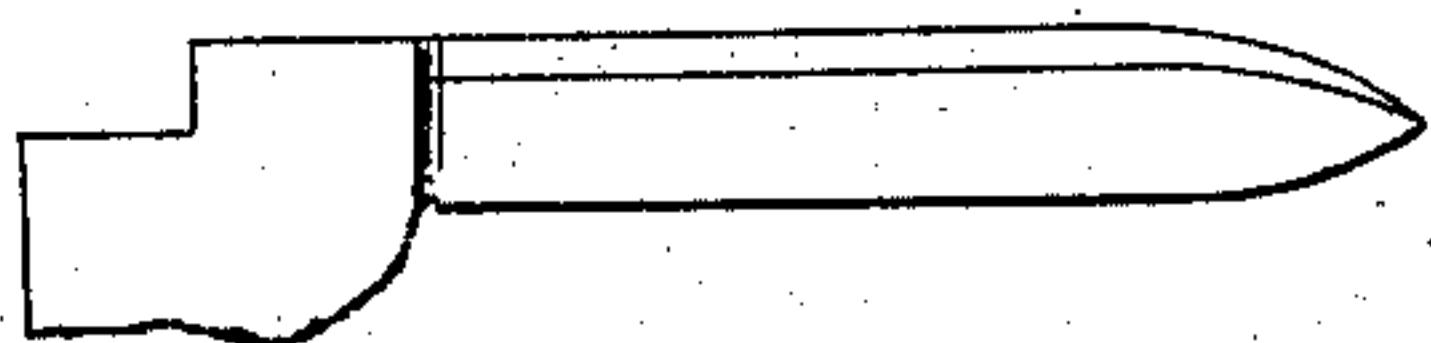
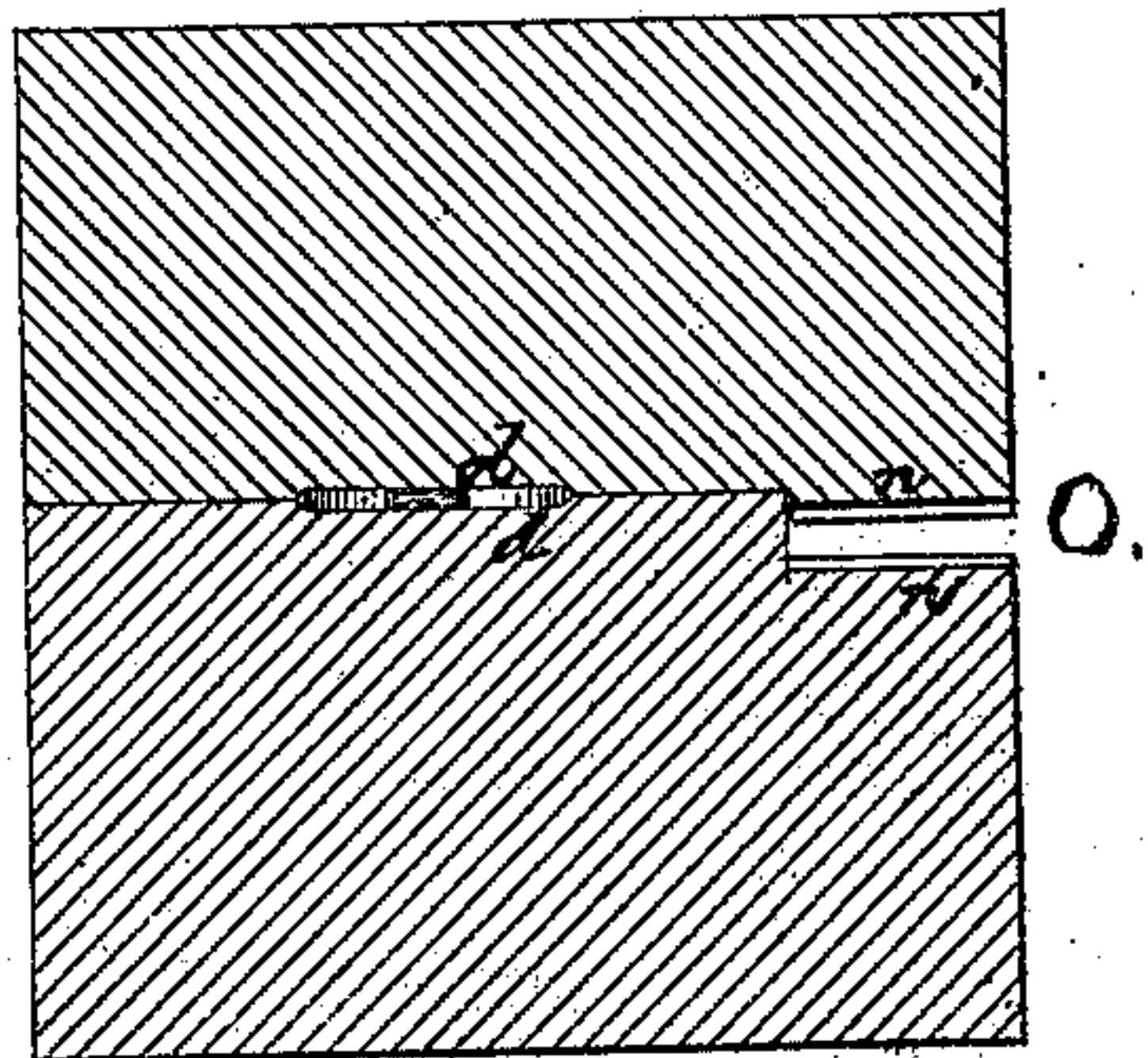


FIG. 6



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN THE MANUFACTURE OF BLADES OF POCKET-CUTLERY.

Specification forming part of Letters Patent No. **106,073**, dated August 2, 1870.

*To all whom it may concern:*

Be it known that we, WILLIAM H. MILLER and GEORGE W. MILLER, of Meriden, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Dies for Forging Blades for Pocket-Cutlery; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a plan view of one-half the die. Fig. 2 is a plan view of the other portion. Fig. 3 is a side view, showing the break-down die. Fig. 4 is a vertical transverse section of the dies, when placed together, through line C D of Fig. 3. Fig. 5 is a vertical transverse section of the same through line E F of Fig. 2. Fig. 6 is a vertical transverse section of the same through line G H of Fig. 2. Fig. 7—N is a side view of a blank after being operated upon by the break-down die o, and M is a plan view of the same piece after being operated upon by the finishing-die L. Fig. 8 is a view of a blade after it has been forged and the burr removed.

Our invention relates to the manufacture of blades for pocket-cutlery; and consists of two dies or pairs of dies, used in connection with each other, one of the said dies or pairs of dies preparing the metal in the bar for its final shape by pressing or gathering it together at certain places, for the purpose of bringing the stock in a common bar of metal to those points where it is most needed in the manufacture of the blade. The other die or pair of dies gives the desired final shape or form to the blade, both operations being performed while the metal is properly heated, and pressure applied to the dies while the metal is placed therein.

The object of our invention is to enable the manufacturer to form the blades of pocket-cutlery with as little manipulation of the metal as possible, and yet not be obliged to use bars of metal of such size as to incur too much waste in their manufacture, thus saving time, labor, and expense in the operation.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same and its application to use.

In the drawing, A and B represent two blocks of metal, which, for convenience, contain the two dies required for the conversion of a portion of a bar of steel into a blank knife-blade; and, although the dies are in two parts—that is, one-half of the die is in one block, A, and the other in the block B—I denominate the halves one die, inasmuch as the halves are necessary to give the required form to the metal. One of these dies I denominate the “break-down,” as it is designed to break down or depress the metal or crowd it together in certain places, making the bar thicker in some parts and smaller in others, and this break-down is represented upon the side O of the blocks A and B. The form of this die is shown more fully in Fig. 3, in which  $x''$  is a recess, terminating at each end in the elevated points  $s$  and  $s'$ , the point  $s'$  being the highest, and from these two points the planes  $n'$  and  $m'$  extend, inclining downward as they approach the ends of the block B. In the block A is another recess,  $x'''$ , opposite the one in the block B, and terminating in the ridges  $s''$  and  $s'''$ , and in said recess  $x'''$  is a protuberance,  $x'$ . From these ridges  $s''$  and  $s'''$  the planes  $n$  and  $m$  extend each way, and incline upward as they approach the ends of the block A. The depressions  $x''$  and  $x'''$  and the protuberance  $x'$ , when the blocks A and B are placed together, form a recess, which somewhat resembles, and approximates in its form, the heel of the knife-blade or the cavity  $a$  in the die.

The line  $t$  in Fig. 3 represents the line of division between the blocks A and B. In practice, one of the blocks is set in a firm and solid position, while the other is fixed in a position to move downward upon the other block, and if a bar of metal be heated and placed lengthwise in the die thus described the ridges or parts  $s$  and  $s''$ , and also  $s'$  and  $s'''$ , approach nearer to each other than at any other part of the dies or blocks, and the metal is pressed harder at those points and is forced back each way, a part being crowded back into the recess at  $x''$   $x'''$ , while the space between the planes  $n$  and  $n'$  and  $m$  and  $m'$  being widest at the outer ends, the metal is forced outward toward the ends and assumes the form of the break-down die, and the metal is forced, in a bar of uniform size, by this process into those



parts of the bar where it is required to have the largest quantity of stock, and without the longer process of hand-forging, as is now practiced. This operation of breaking down the metal brings it into the form shown in Fig. 7, at N, wherein the metal at  $a'$  is pressed into the proper form and in the right quantity to fill the part  $a$  in the die A B, which forms the heel of the blade, this part requiring more metal than the same length of any other part of the blade. The part  $b''$  of the blank N also contains about the right quantity of metal to form the blade by pressure in the die A B.

The cavity  $d$  is made in the blocks A and B, and is so shallow as to press the bar of metal very thin when placed therein. The size of this cavity, when the parts A and B of the die are placed together, is shown more fully in Fig. 6, and when the bar of metal has been pressed in this part of the die it is then in better shape to be drawn out into the proper form for the blade by the break-down die, hereinbefore described.

The cavity  $a$  is flat at its base, and is of the proper size and shape to form the entire heel of the blade, and is shown in cross-section in Fig. 5.

The cavity  $b$  is made one half in one block, A, and the other half in the block B, the part  $b$  being that part of the die which forms the blade at its thickest or heaviest part along the back. The part along the dotted line  $c$  is made more shallow, while the part at  $c'$ , from the part  $a$  to the end of the die, is made a little deeper, to allow room for the waste stock when the pressure is applied to the metal in the die, and a shallow cavity is also made at  $e$ , extending from the point  $e'$  to the outer end of the die. This cavity  $e$  also allows room for the waste stock of the blade when pressure is applied to the metal in the die.

The edges  $f'$  of the cavity  $b$  may be beveled in such portions as are desirable to give the proper bevel to the back and point of the blade. That part of the die which is thus de-

scribed and forms the blade is shown in cross-section in Fig. 4.

No shallow cavities are required around the part  $a$  of the die, as it is designed that as little waste stock should be left projecting from the heel of the blade in the blank as possible, while it is desirable that the blade should be left a little thicker in the blank than in the finished blade, in order to have sufficient metal to operate upon successfully in the process of tempering the blade and in giving it its final finish.

The small cavity  $o$  is made merely to give sufficient metal at that point in the blank to hold the blank blade to the rod in punching off the waste stock or burr from the blade.

Fig. 8 represents a blade after the waste stock or burr has been removed, which may be done by means of a die and counter-die of the desired shape of the blade.

It will be perceived that by this operation the whole process of forming the blade of a pocket-knife is confined or limited to three simple operations or movements of a die, while the small amount of time required to form each and the facility with which any number of blades of any desired style or pattern may be produced without the least variation renders this process a very advantageous one over the old process of forging the blades by hand.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The process herein described of forging the blades of pocket-cutlery—that is to say, by first subjecting the metal to pressure in the break-down die O, and then finishing the forging of the same by submitting it to pressure in the finishing-die L, substantially as herein set forth.

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Witnesses:

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JOHN Q. THAYER.