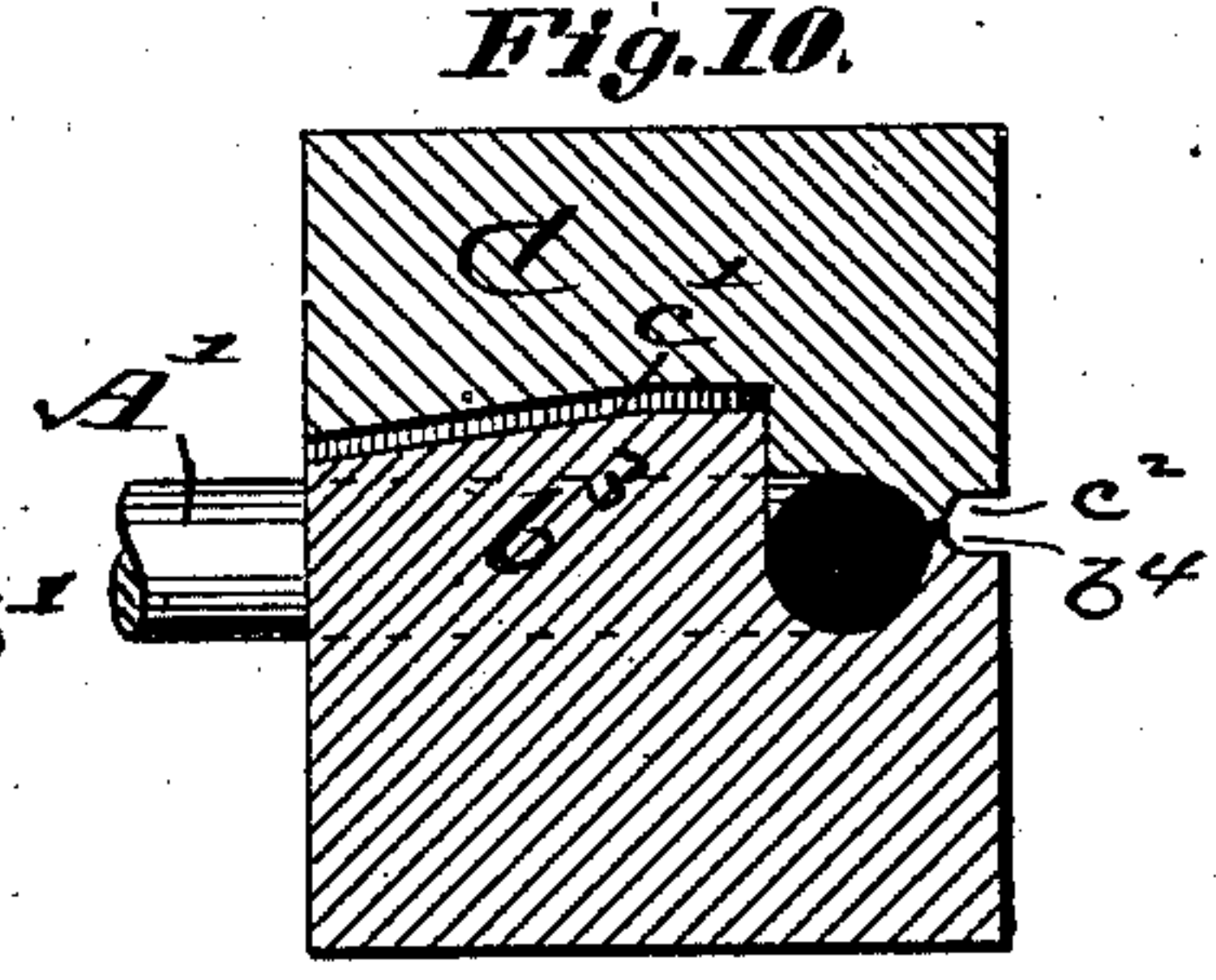
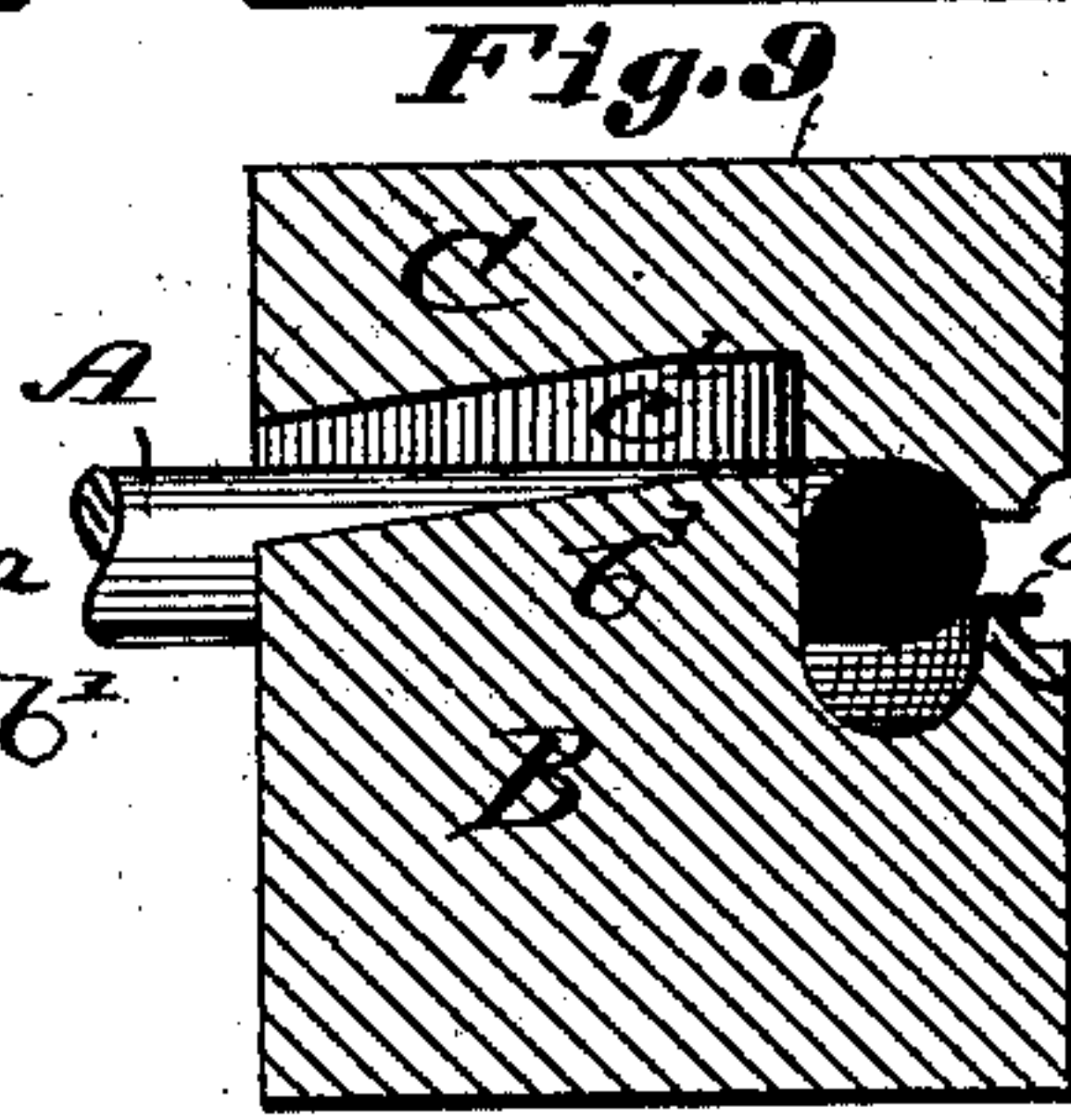
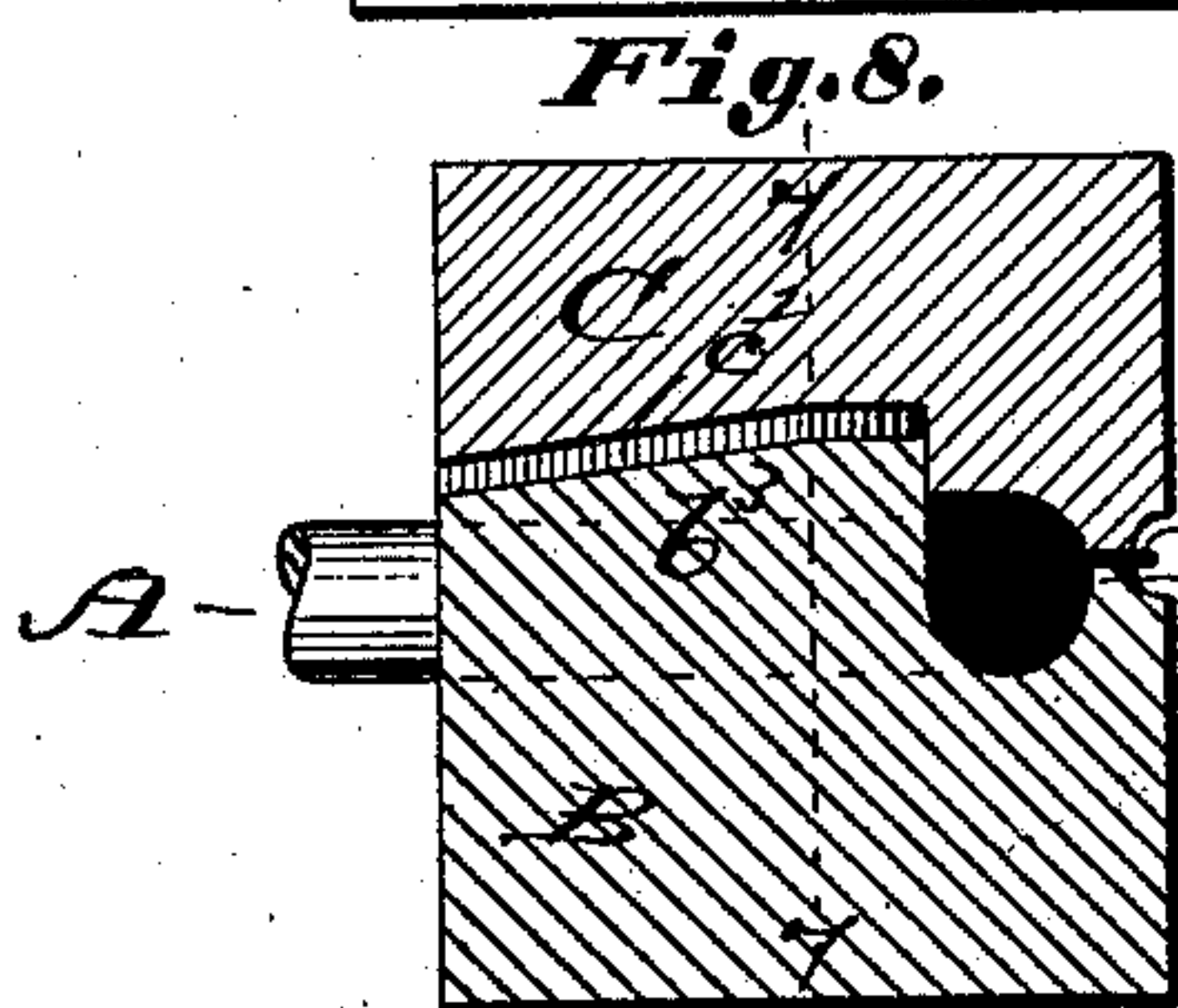
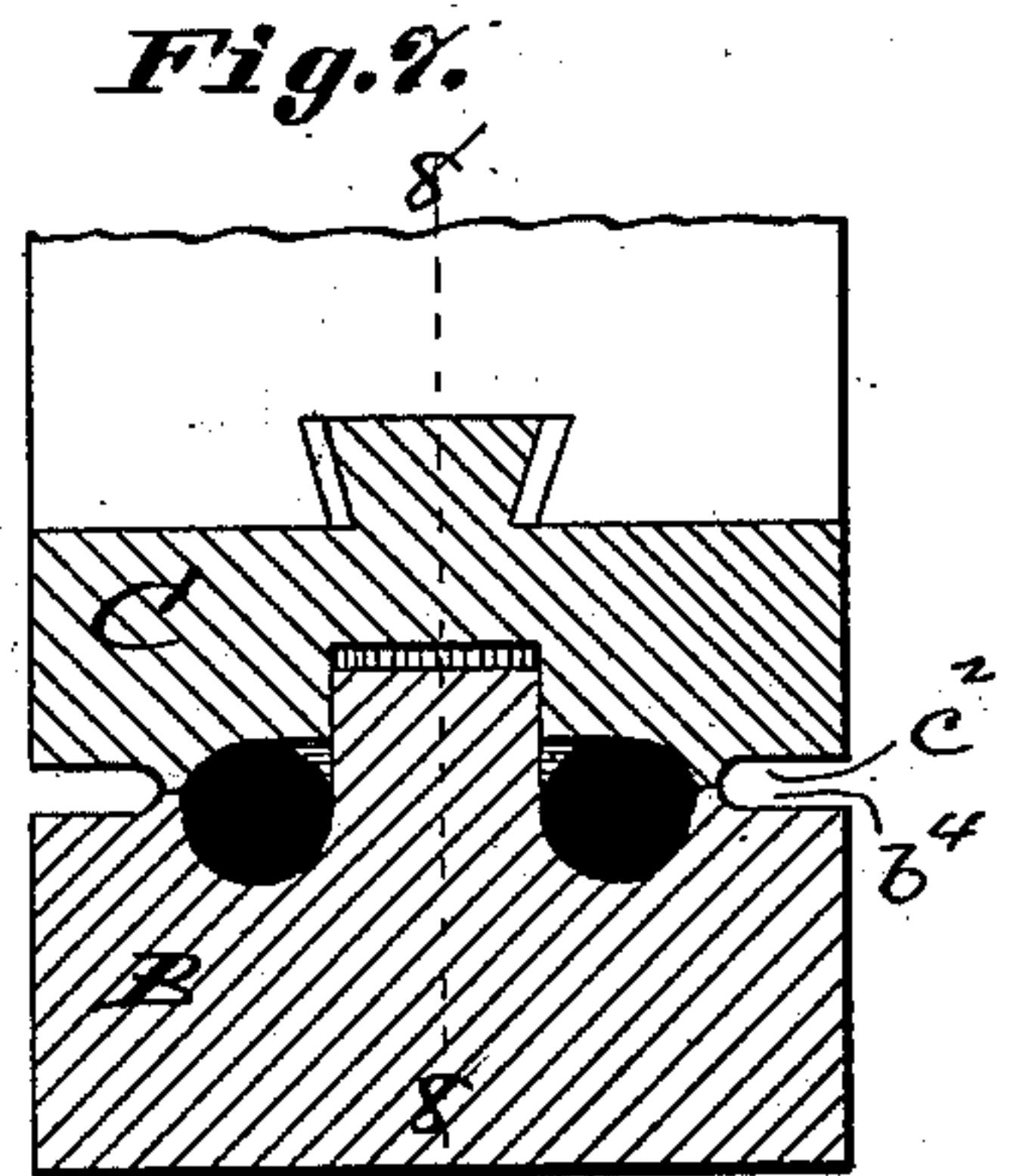
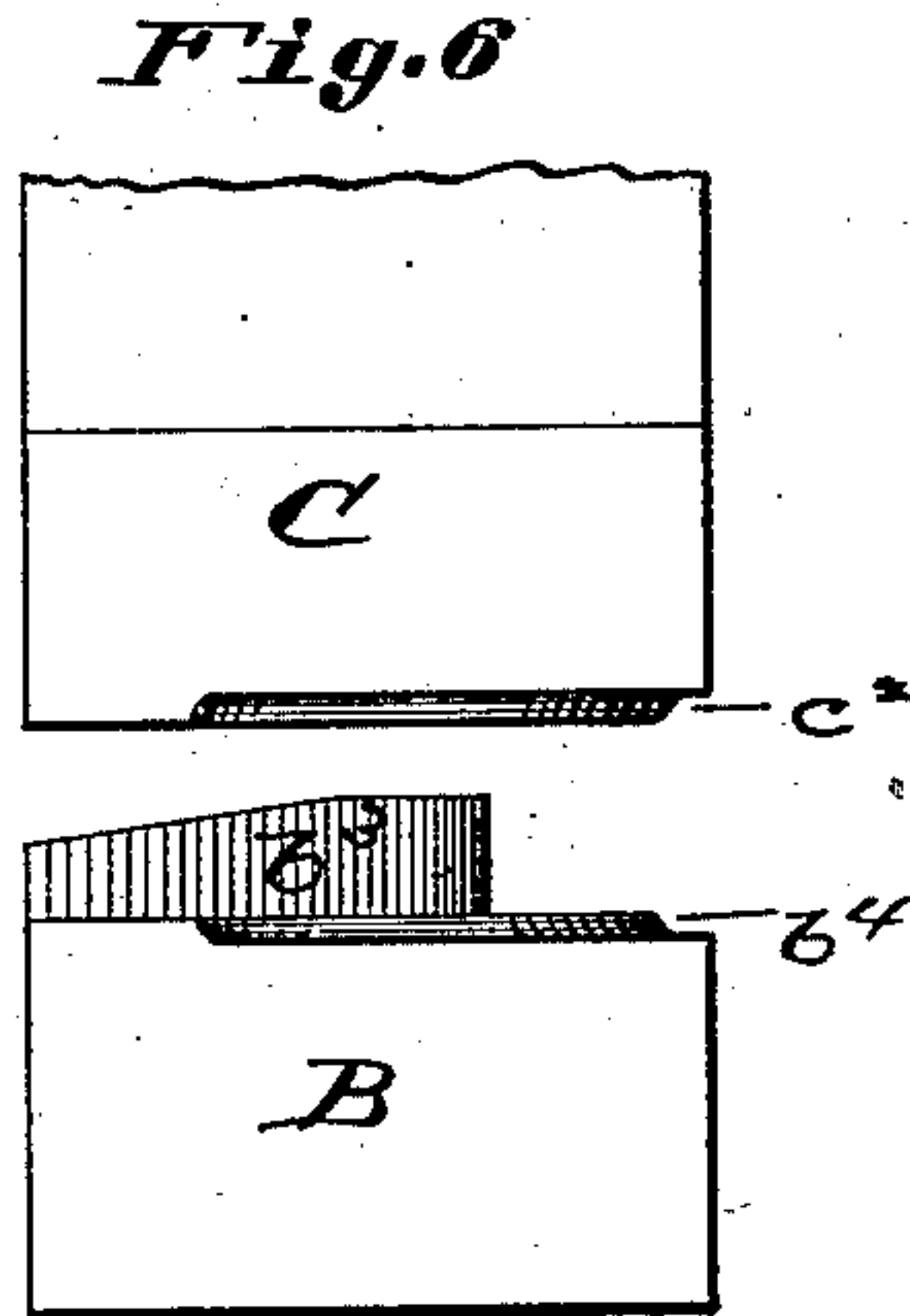
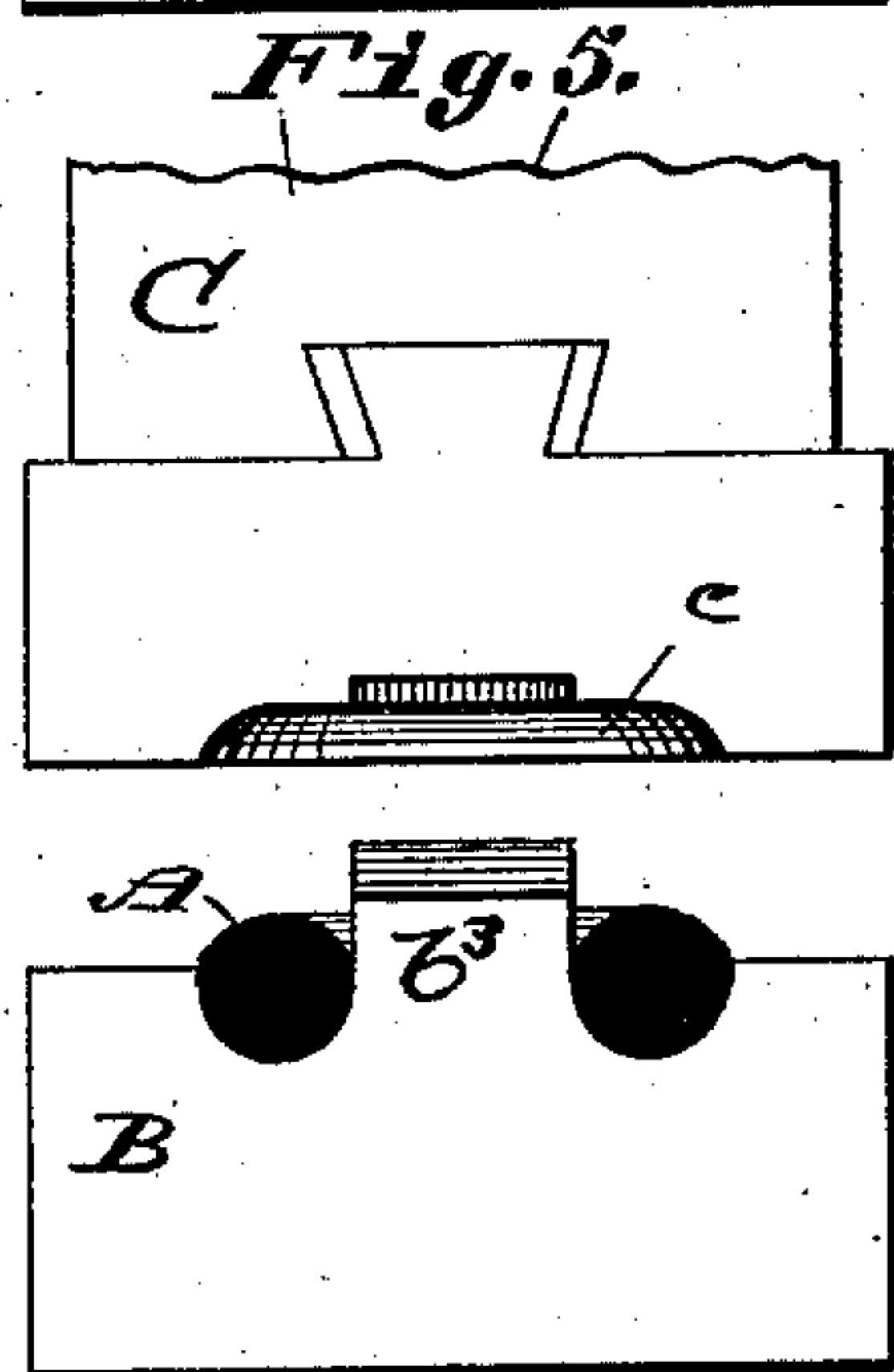
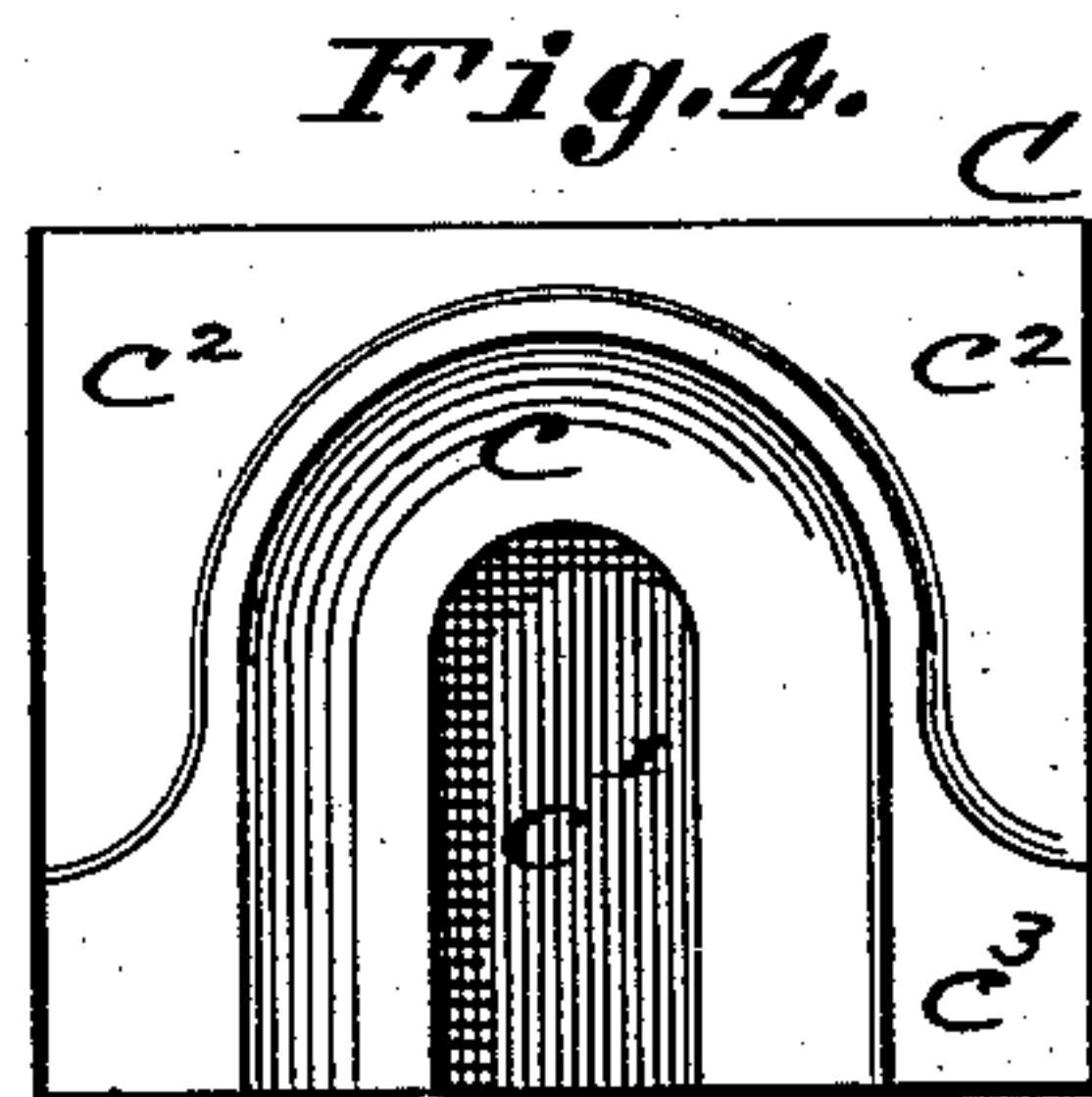
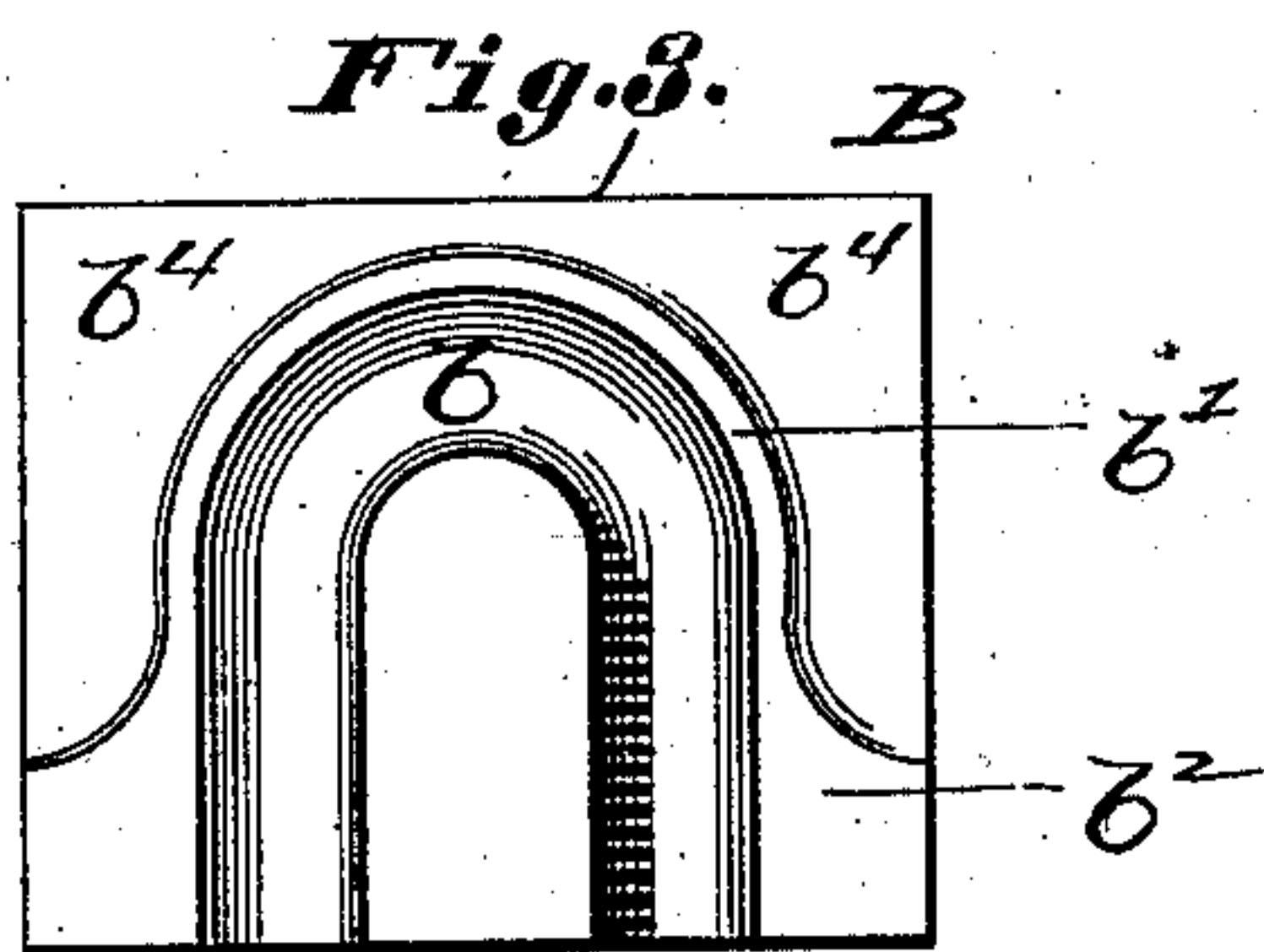
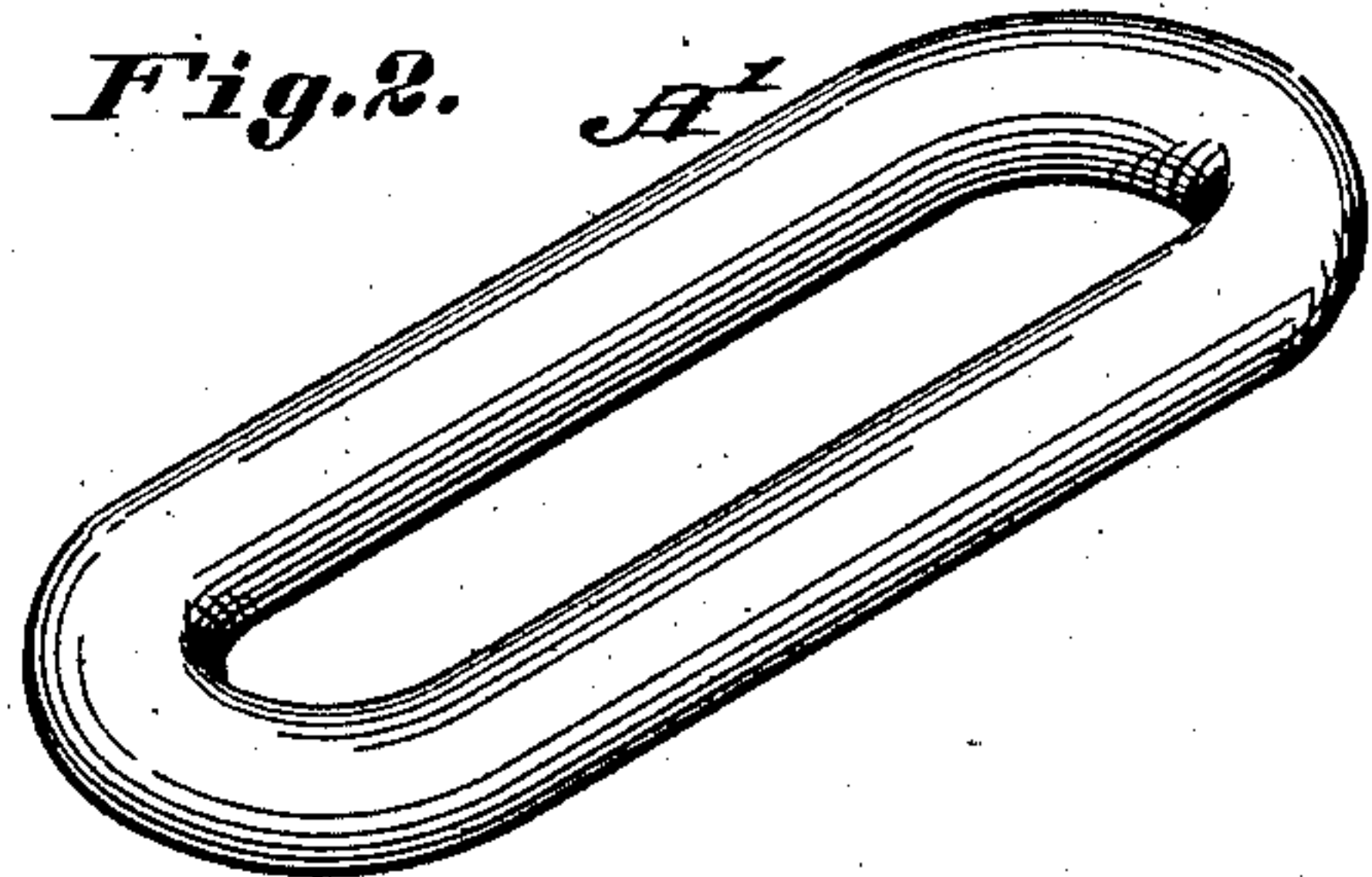
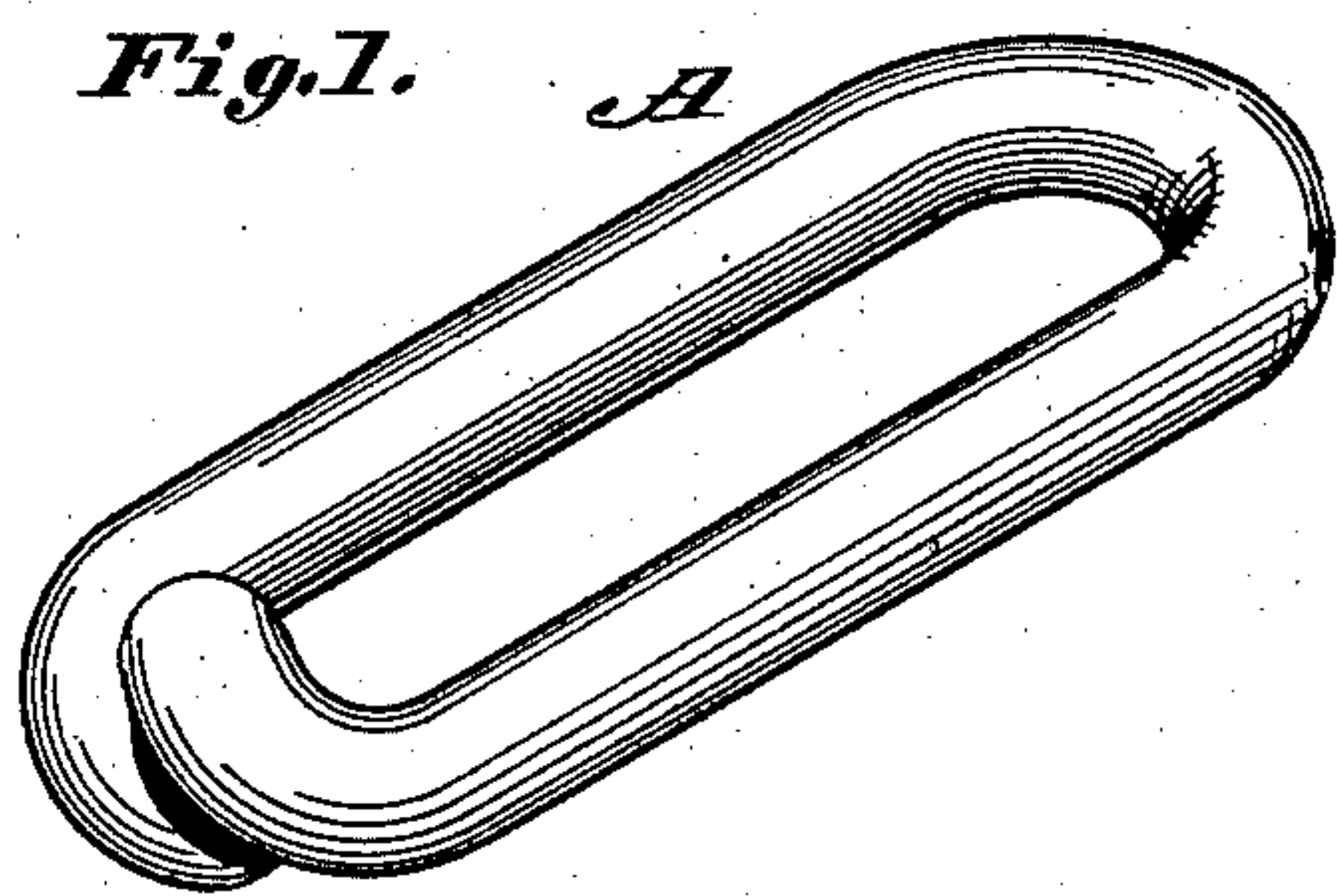


(No Model.)

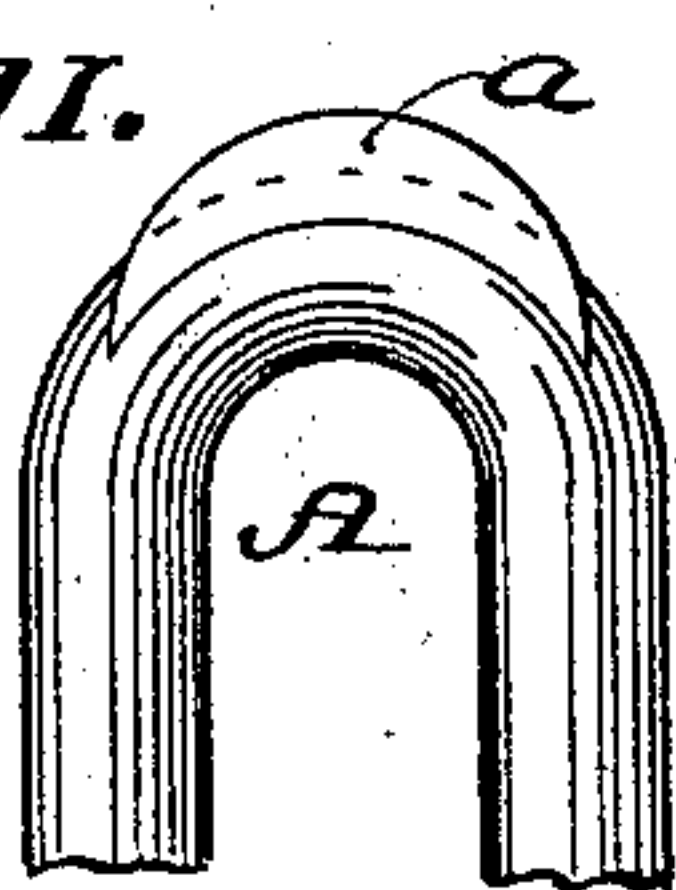
A. McINNES.  
LINK WELDING DIE.

No. 294,060.

Patented Feb. 26, 1884.



*Attest:*  
*Saml. S. Boyd*  
*Chas. Williams*



*Inventor:*  
*Alexander McInnes*  
*by C. P. Moody.*  
*atty.*



# UNITED STATES PATENT OFFICE.

ALEXANDER MCINNES, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE HELMBACHER FORGE AND ROLLING MILLS COMPANY, OF SAME PLACE.

## LINK-WELDING DIE.

SPECIFICATION forming part of Letters Patent No. 294,060, dated February 26, 1884.

Application filed June 28, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER MCINNES, of St. Louis, Missouri, have made a new and useful Improvement in Link-Welding Dies, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a view in perspective, showing the link as before welding; Fig. 2, a view of the link welded; Fig. 3, a face view of the lower part of the die; Fig. 4, a face view of the upper part of the die; Fig. 5, a front elevation of the die, the upper part being raised; Fig. 6, a side elevation of the die, the upper part being raised; Fig. 7, a vertical section taken on the line 7 7 of Fig. 8; Fig. 8, a section taken on the line 8 8 of Fig. 7, the link being welded and the fin formed thereon; Fig. 9, a section similar to that of Fig. 8, the upper part of the die being raised, and the link being reversed to bring the fin into position for being sheared off; Fig. 10, a section similar to that of Figs. 9, 10, the die being closed and the fin sheared off; and Figs. 11 and 12, respectively, a plan and an edge view of the link before the fin is removed.

The same letters denote the same parts.

The present invention relates to the construction of the recesses in the parts of the die, and the mode of forming and removing the fin.

A, Fig. 1, represents the form in which the bar is prepared for the die, the link being shaped and ready for welding.

B C represent the two parts of the improved die. The lower part, B, has a recess, *b*, to receive the end of the link to be welded. The noticeable feature of the recess is its depth, the recess, measured from the level of the outer portion, *b'*, of the face *b<sup>2</sup>* of the part B, being deeper than one-half the thickness or diameter of the bar from which the link is being made, and the walls of this recess above a horizontal plane intersecting the semicircular floor of the recess are perpendicular to said plane; or the walls may have a slight upward flare to allow the link to be readily drawn. I will here state that during the first opera-

tion of the dies on the link the recess in both dies will be entirely filled with metal, the surplus being pressed out between them, forming the fin *a*. The center *b<sup>3</sup>* of the part B is elongated in the direction of the length of the link, and it is projected upward higher than the entire thickness or diameter of the bar from which the link is made.

The upper part, C, of the die conforms to the lower part, B, the recess *c* therein being shallower than one-half the thickness or diameter of the bar from which the link is made, and at the center of the part C is a chamber, *c'*, to receive the projection *b<sup>3</sup>*. The outer portion, *b<sup>4</sup>*, of the face *b<sup>2</sup>* of the part B, as well as the outer portion, *c<sup>2</sup>*, of the face *c<sup>3</sup>*, of the part C is shaped out somewhat, to provide clearance for the scale incident to the operation.

The welding operation is as follows: The bar, in the form shown in Fig. 1, is laid in the recess *b* of the part B. The part C is then closed upon the part B and bar A, forcing the bar into the position shown in Figs. 7, 8. The projection *b<sup>3</sup>* serves to guide the part C to its proper bearing upon the part B. It also acts to force such metal as is in excess of what is needed in forming the weld to the outer side of the recess *b*, where it is formed into a fin, *a*. This fin, however, owing to the depth of the recess *b*, comes above the center of the link, as seen in Fig. 8. The upper part of the die is then raised, and the link reversed and laid in the position shown in Fig. 9. It will be seen that in this position the link is upheld over the recess *b* by reason of the fin bearing upon the edge *b'*. The upper part, C, is then closed again upon the lower part, B, forcing the link from the position shown in Fig. 9 into that shown in Fig. 10, and in so doing, shearing the fin from the link and finishing the latter, as shown at A', Fig. 2.

It will be seen that after the first operation the link will present an angular portion, as well as a fin, and that during the second operation of cutting off the fin said angular portion will be more or less reduced. During the third or finishing operation the link will be made approximately round in cross-section.

It is not necessary that the link should be exactly cylindrical in cross-section.

I claim—

5 The die herein described for welding links and cutting off the fins, consisting of the part B, having a recess,  $b$ , of a greater depth than the diameter of the finished link, the projection or guide  $b^3$ , and the recess  $b^4$ , forming a raised fin-cutter, in combination with the part C,

having a recess,  $c$ , of less diameter than the finished link, the chamber for receiving the projection  $b^3$ , and the recess  $c^2$ , forming the upper fin-cutter, all constructed and adapted to operate substantially as described.

ALEXANDER MCINNES.

Witnesses:

C. D. MOODY,  
ALBERT G. FISH.