

J. SEARS.

Manufacture of Tips for Soldering-Irons.

No. 154,523.

Patented Aug. 25, 1874.

FIG. 1.

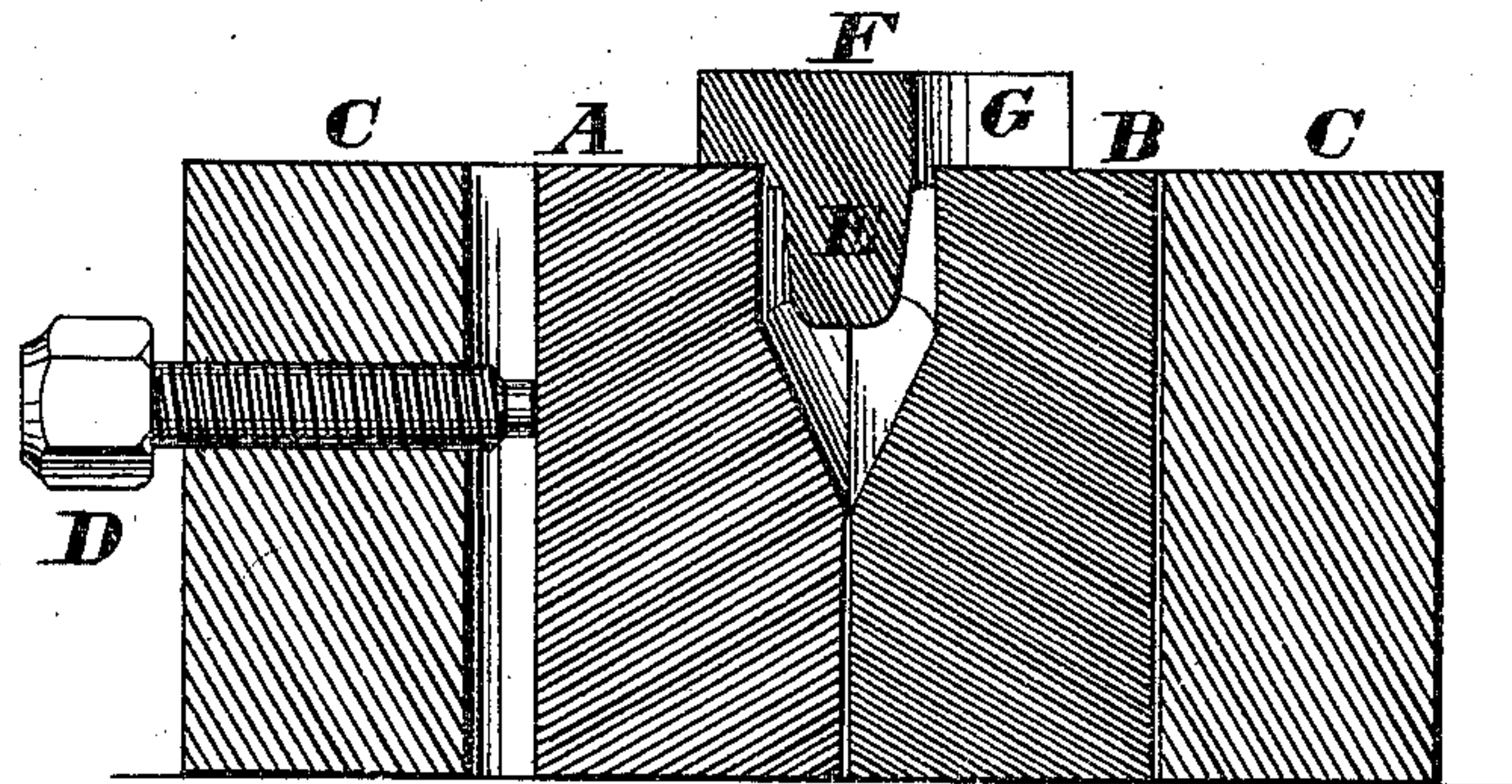


FIG. 2.

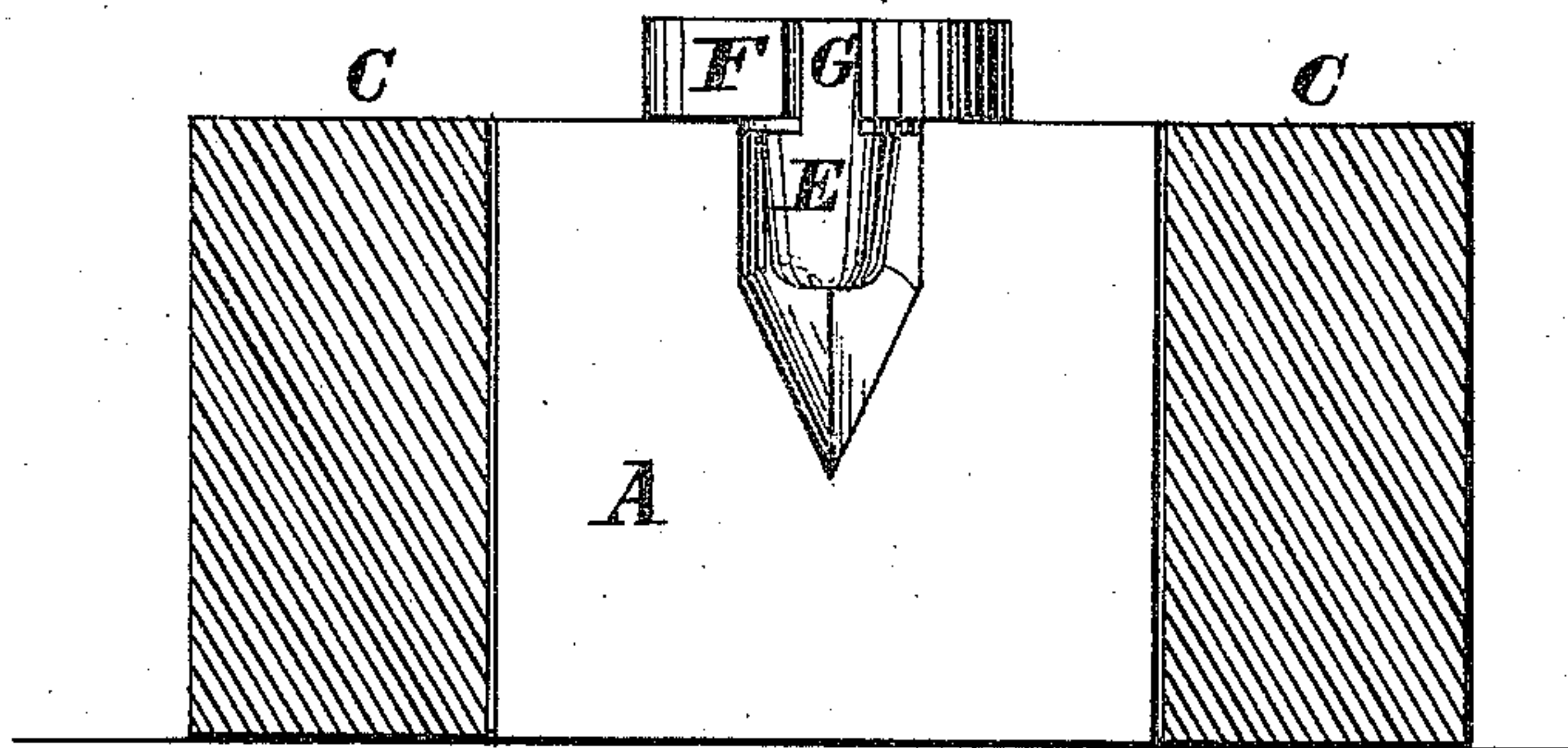
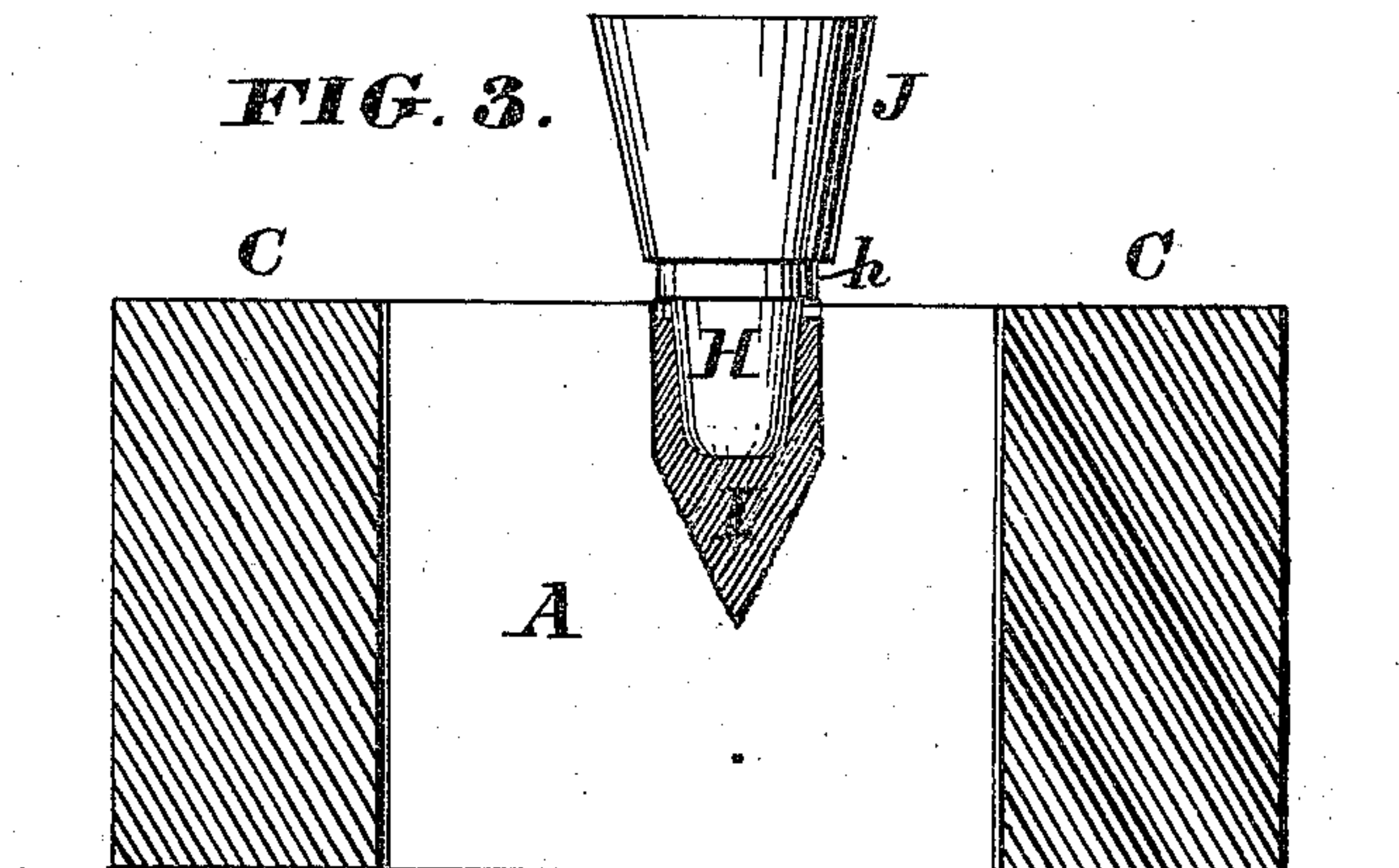


FIG. 3.



WITNESSES:

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INVENTOR:

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FIG. 4.

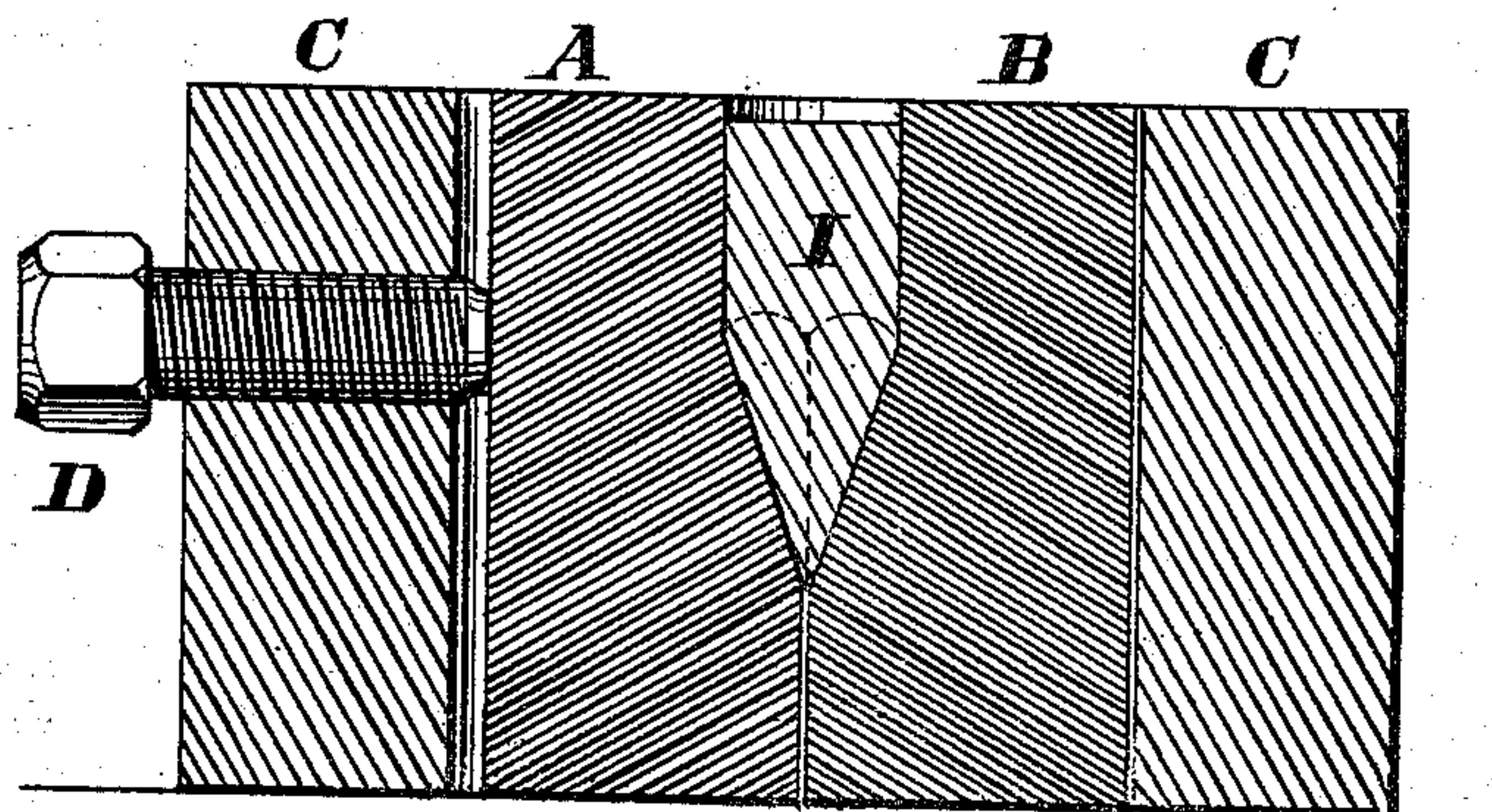
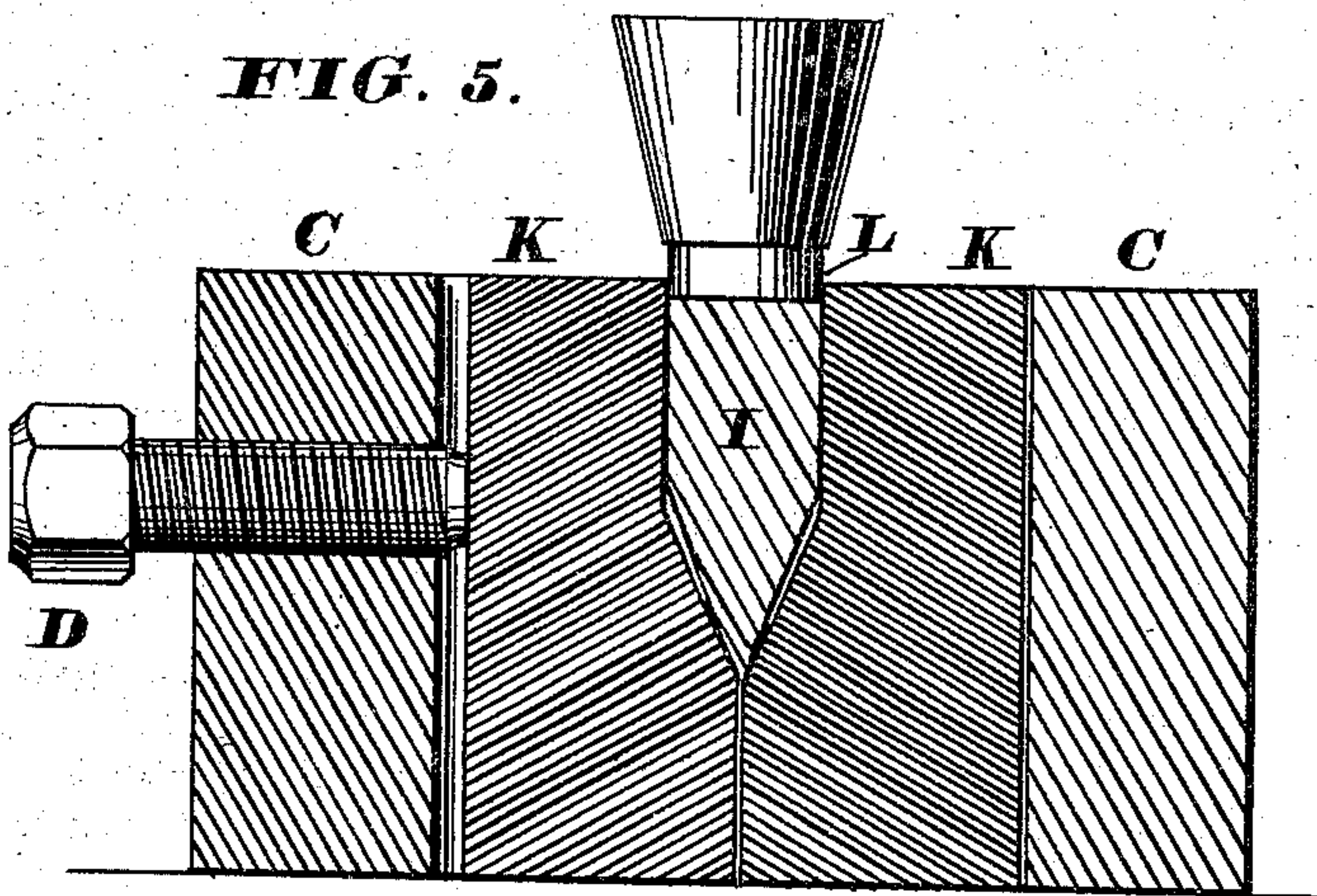


FIG. 5.



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# UNITED STATES PATENT OFFICE.

JOSEPH SEARS, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN THE MANUFACTURE OF TIPS FOR SOLDERING-IRONS.

Specification forming part of Letters Patent No. **154,523**, dated August 25, 1874; application filed August 15, 1873.

*To all whom it may concern:*

Be it known that I, JOSEPH SEARS, of Chicago, in the county of Cook and State of Illinois, have invented an Improved Process for Manufacturing Copper Tips for Soldering-Irons, of which the following is a specification:

My process consists in first preparing the tip in proper shape, or in shape approximating to that which it is intended to have, and subsequently swaging or pressing it, by means of a drop or other press, within dies so formed as to impart the first and greater pressure and condensing effect to the point.

In the accompanying drawings, Figure 1 is a longitudinal section of a two-part molding-die, such as may be used in carrying out my process, as applied to the manufacture of hollow soldering-tips. Fig. 2 is a transverse section of the same. Fig. 3 is a longitudinal section of a similar die, with swaging-plunger applied. Fig. 4 is a longitudinal section of a mold employed for casting solid tips. Fig. 5 is a longitudinal section of a pair of dies employed for swaging and pressing the same, one of the solid tips being shown in position preparatory to swaging.

Referring to Figs. 1, 2, and 3, A B represent two parts of a steel mold or matrix-die, surrounded by a yoke, C, and held together by a clamp-screw, D. The chamber of this die is square in its transverse section, and tapers downward to give the required form to the point of the tip, the plane of separation between the parts of the die passing diagonally through two opposite angles. E is a core, suspended within the matrix from a cap-plate, F. G represents the pouring-gate. In Fig. 3, H represents a plunger or mandrel, corresponding in diameter with the core E, but somewhat longer, so that, when first applied, its head, *h*, is not in contact with the base of the cast tip I. J represents a drop by which the swaging may be effected. In Fig. 4, A B represent two parts of a mold similar to that shown in Fig. 1, but without a core, and formed to produce a solid tip, I, of greater length and with a more tapering point than the finished tip. In Fig. 5 the solid tip is shown in a two-part forming-die, K K, within which the point is first compressed and the entire tip subsequently hammered, so as to condense the metal, by means of a plunger, L, of the same area as its base.

My process may be carried out in either of the following modes, according to whether a hollow or a solid tip is to be produced, the process being the same in its essential features and peculiar results, and differing only in details well known to the art.

For producing a hollow tip, the metal is cast within a steel die, such as shown in Figs. 1 and 2, and are readily removed by withdrawing the clamp-screw D and allowing the parts of the die to separate slightly. After casting a number of tips the die is placed in a drop press or other suitable press, the drop of which should weigh from sixty to one hundred pounds. The tips are then heated to redness and placed in the die, with a plunger or mandrel, H, in the cavity, of slightly greater length than the core by which such cavity was formed, so that the base *h* of said mandrel, which is extended in size to that of the entire base of the tip, is slightly separated therefrom when the punch is first inserted. The object of thus making the mandrel of greater length is to impart the first condensing effect to the point of the tip. After one or two strokes of the drop, the mandrel or plunger settles down with its head on the base of the tip, after which a number of blows are given to condense the metal throughout the entire tip and swage it into its final shape. The same preliminary compressing of the point is accomplished in the case of a solid tip by means of the apparatus shown in Figs. 4 and 5, the tip being cast with a larger and more tapering point than it is ultimately to have, and subsequently swaged within a suitably-shaped die by blows communicated through the plunger L.

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

As an improved method of manufacturing copper tips for soldering-irons, the construction of the tip with an elongated point and of a shape otherwise substantially as described, and the subsequent reduction, compression, and consequent hardening of said tip, by subjecting it to the action of dies, in the manner substantially as specified.

JOSEPH SEARS.

Witnesses:

HALSTED BURNET,  
HENRY MOREHOUSE.