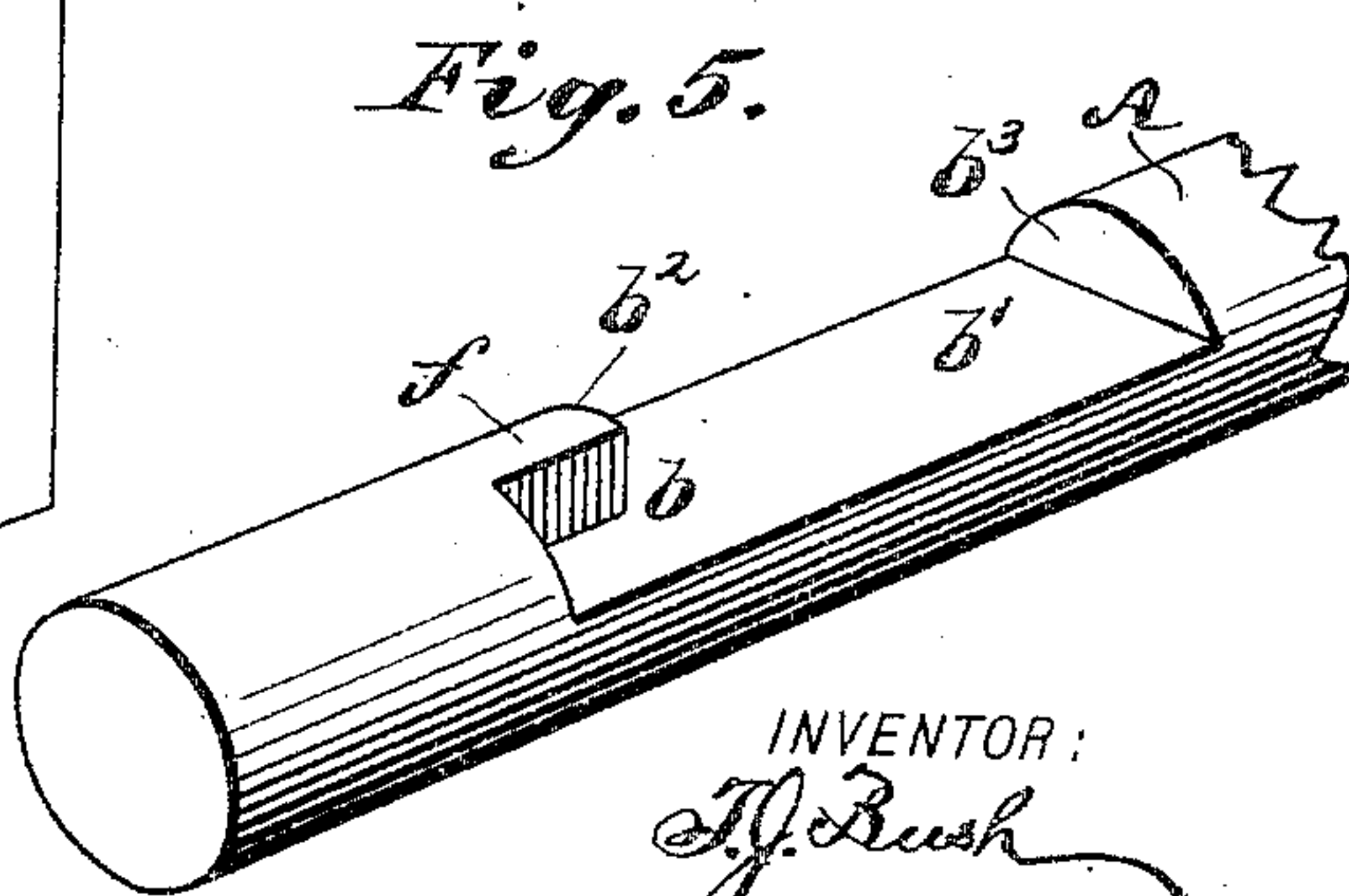
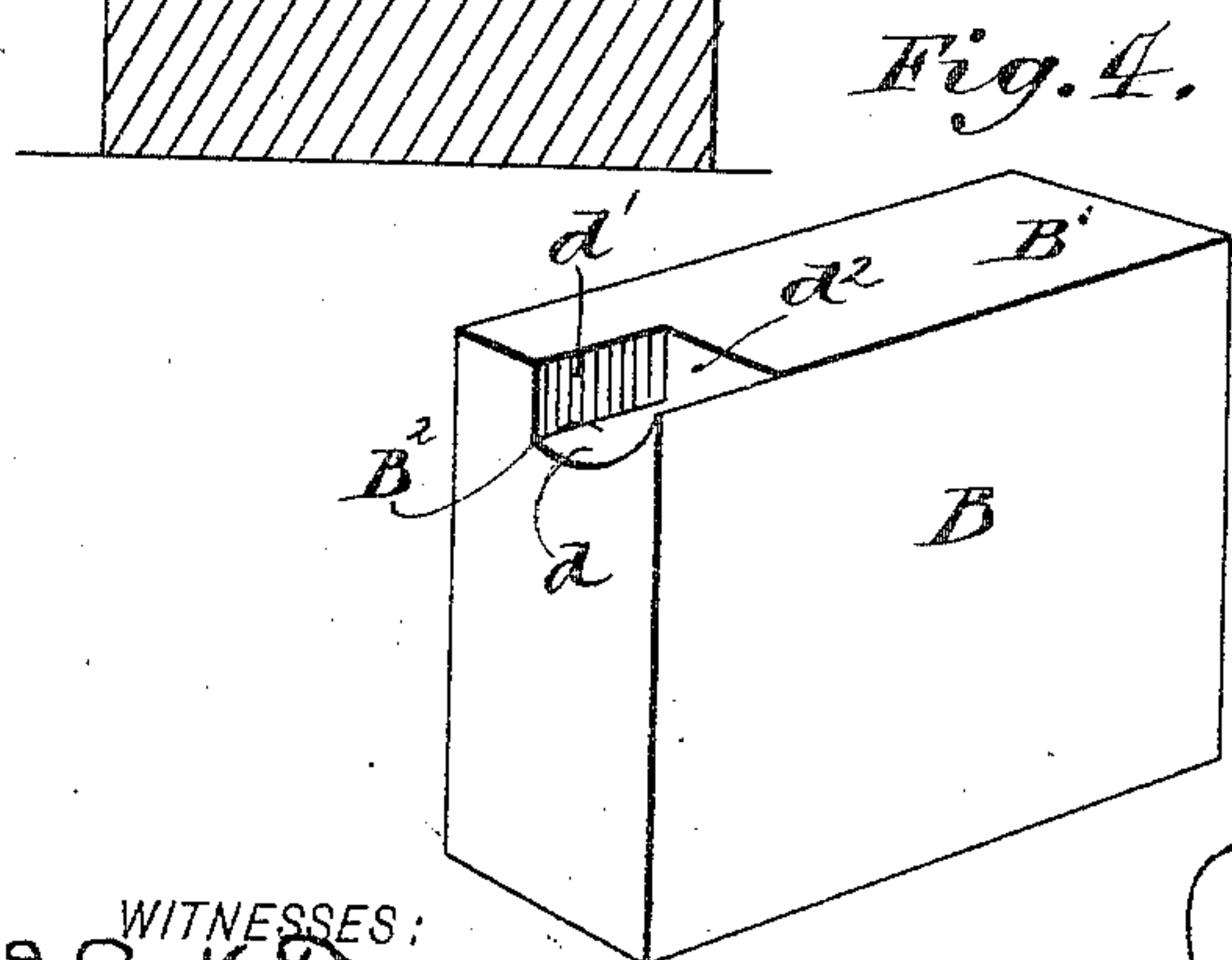
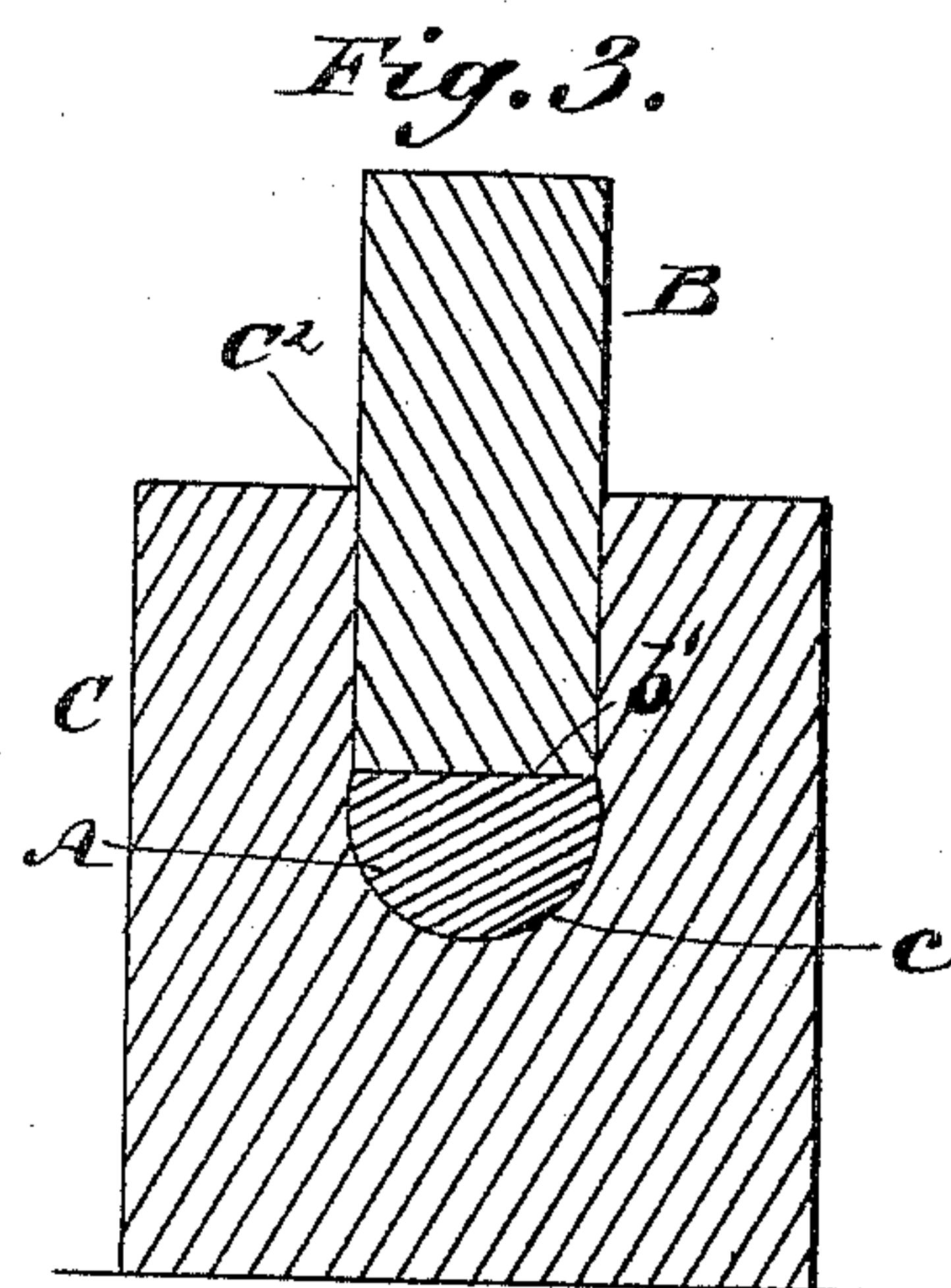
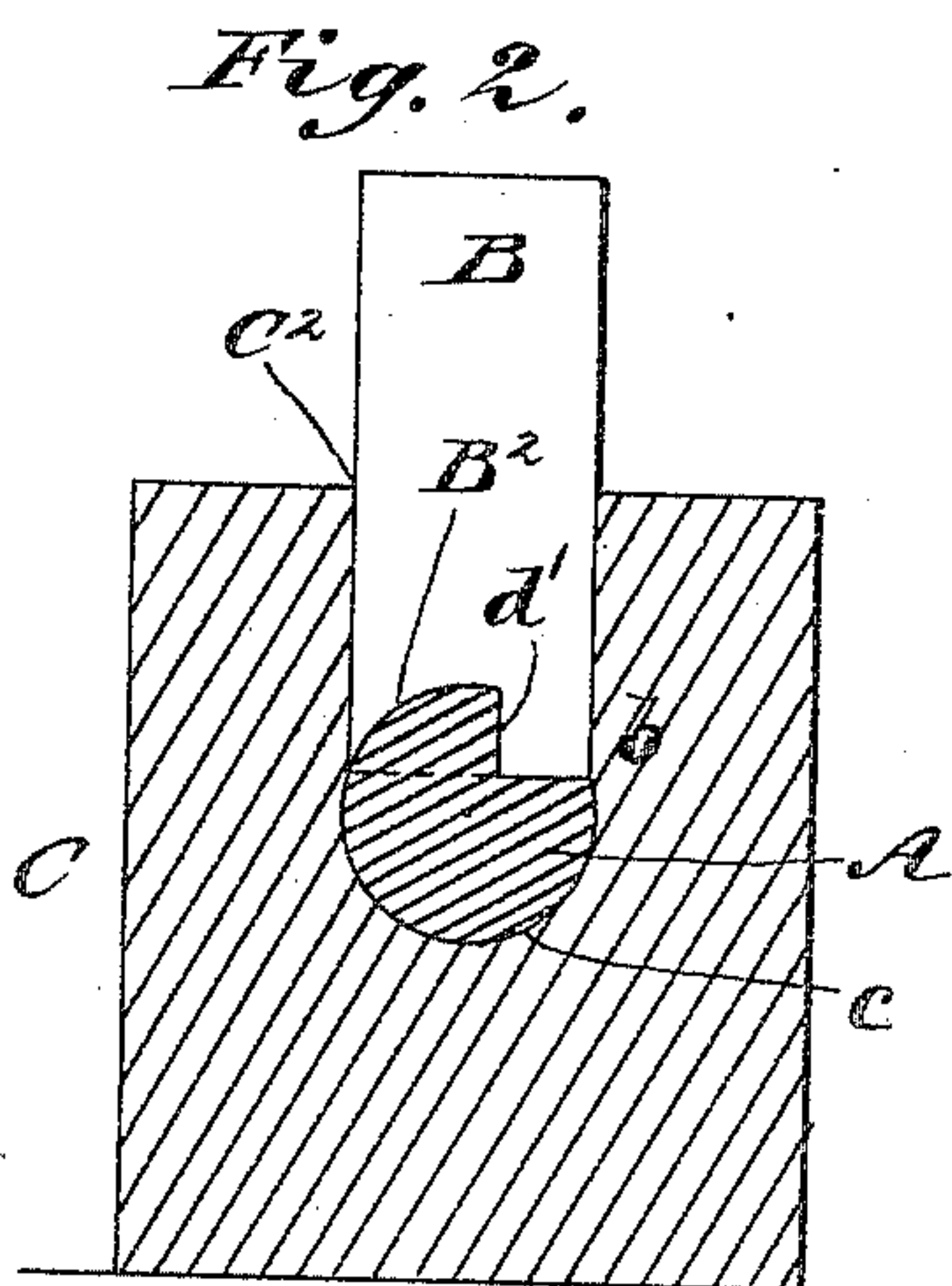
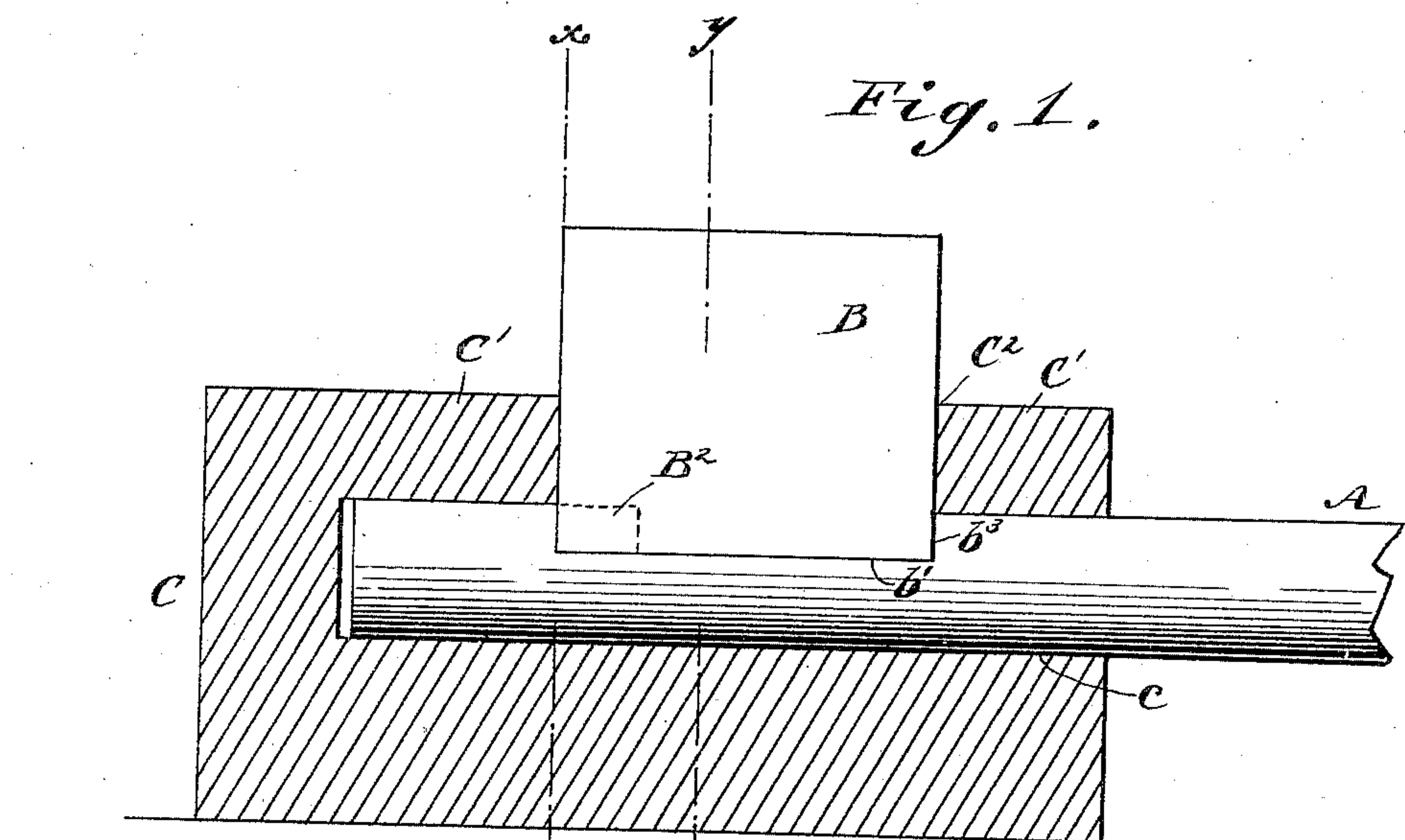


(No Model.)

T. J. BUSH.
DIE FOR MAKING BOLTS.

No. 445,001.

Patented Jan. 20, 1891.



WITNESSES:
John K. Deemer
C. Sedgwick

INVENTOR:
T. J. Bush
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

THOMAS J. BUSH, OF LEXINGTON, KENTUCKY.

DIE FOR MAKING BOLTS.

SPECIFICATION forming part of Letters Patent No. 445,001, dated January 20, 1891.

Application filed May 2, 1890. Serial No. 350,342. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. BUSH, of Lexington, in the county of Fayette and State of Kentucky, have invented a new and Improved Die for Making Bolts, of which the following is a full, clear, and exact description.

My invention relates to a machine for making interlocking bolts, such, or substantially such, as are shown in my patent of September 19, 1882, No. 264,622. The bolt is faced off near its lower end and recessed to form a locking-shoulder, and this facing off and recessing of the bolt I effect by compression without removing the metal, so that while the bolt is reduced in area at the end its strength is not materially weakened.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of the preferred form of die or machine for making the bolts. Figs. 2 and 3 are cross-sections on the lines $x x$ and $y y$, respectively, of Fig. 1. Fig. 4 is a perspective view of the movable die, and Fig. 5 is an enlarged perspective view of the lower end of the finished bolt.

The bolt A is made from a rod of wrought-iron pressed by the movable die B, to which heavy pressure is applied by any suitable means to form a recess b and to face off the side of the bolt, as shown at b' , forming the shoulders $b^2 b^3$. The heavy pressure required to effect this solidifies the metal at that point, so that the bolt is about of the same strength

at the recess as at any other part. In other words, the bolt is not materially weakened, as would be the case if the metal were removed to face off and recess it.

The bolt is shaped in the die C, formed with a seat c , to receive the round rod. This seat may be covered, as shown at C' , said cover having an opening C^2 for the movable die B, or it may be open at the top, with a separate guide for the movable die and with or without separate means to hold the bolt from bending under the pressure.

The undersurface of the punch B, the surface which comes in contact with the bolt, is flat, as shown at B' , except at one corner, where it is formed with a cup B^2 , having a curved surface d and straight shoulders $d' d^2$ at right angles to each other, as shown clearly in Fig. 4, so that in pressing a lug f will be left intact on the bolt, as shown in Fig. 5.

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

The die B, formed at its bottom or inner surface with an aperture or cup shaped to form shoulders $d' d^2$ at one corner of the lower or contact surface, to be used jointly with the die C, formed with a seat for the bolt-blank and with an aperture for the die B coincident with the said seat, substantially as described.

THOMAS J. BUSH.

Witnesses:

H. A. WEST,
C. SEDGWICK.