

(No Model.)

2 Sheets—Sheet 1.

J. H. PHILLIPS.
EXPANDING REAMER.

No. 478,069.

Patented June 28, 1892.

Fig. 1.

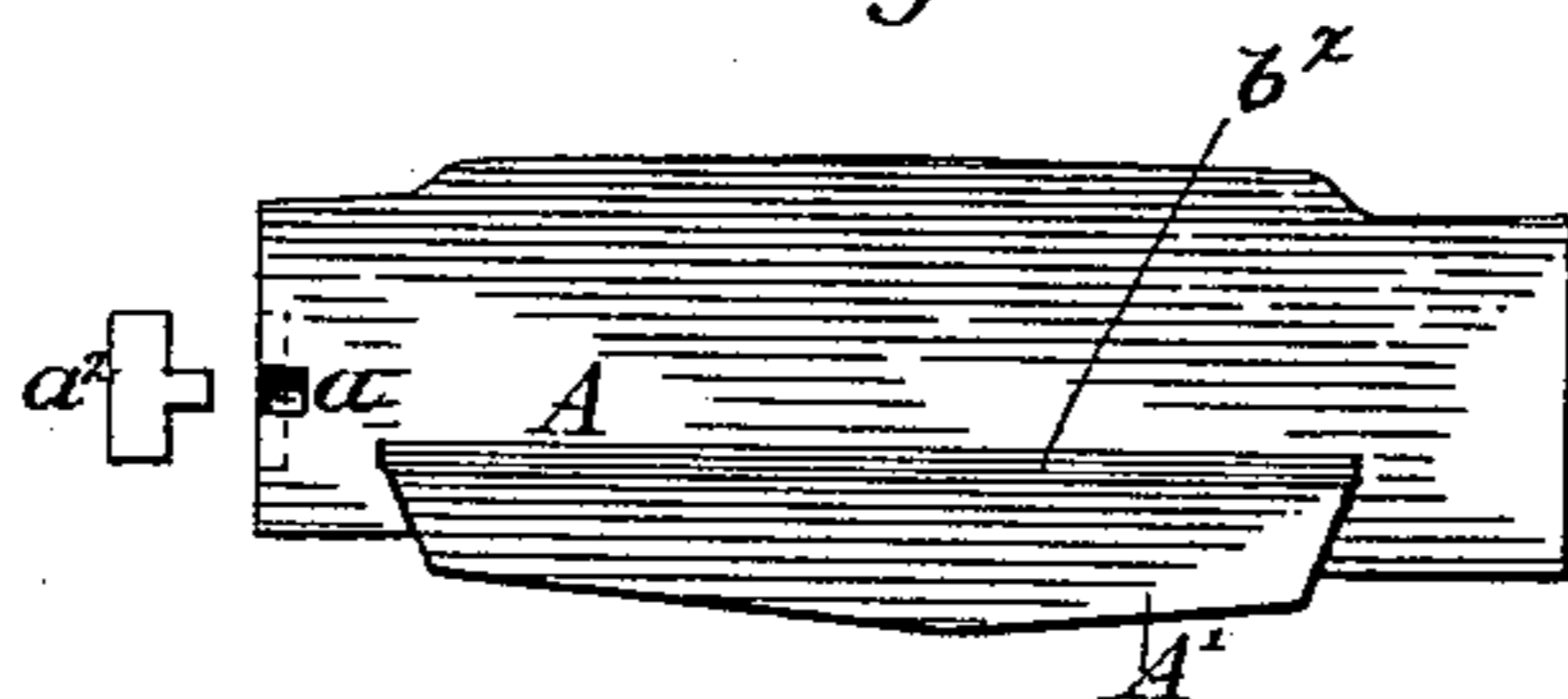


Fig 2.

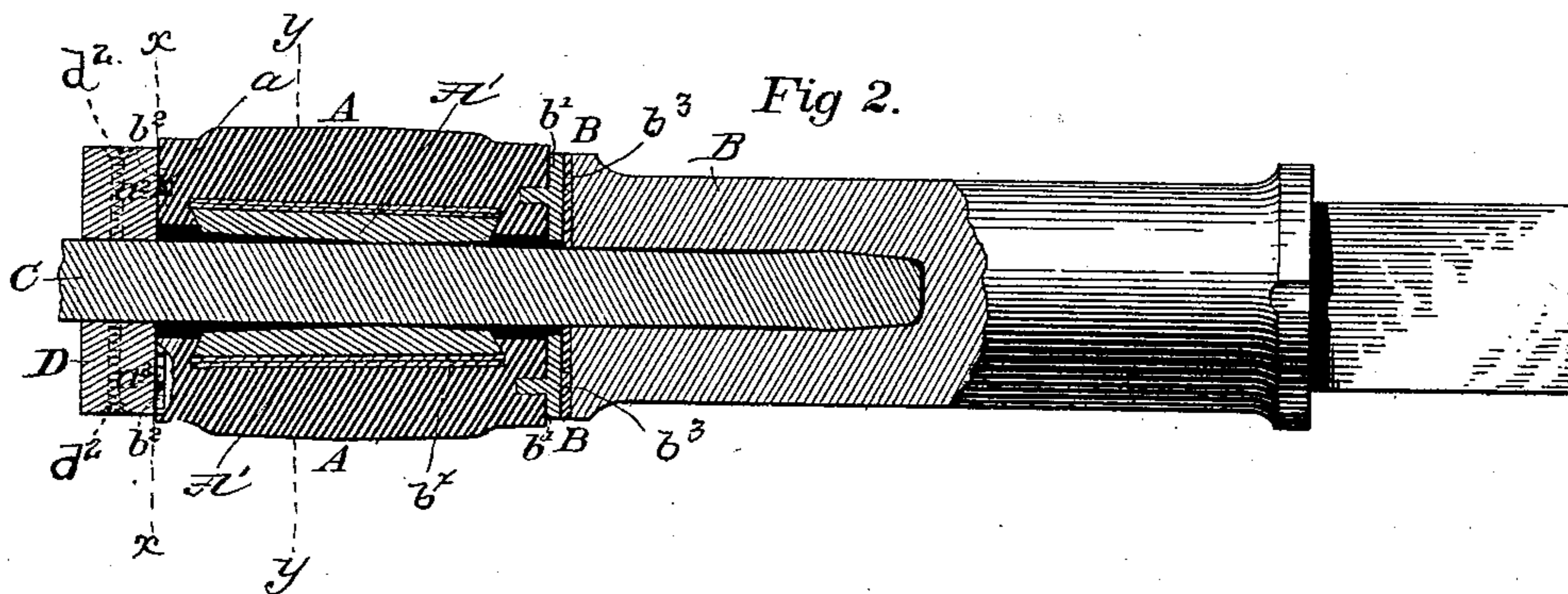


Fig. 3.

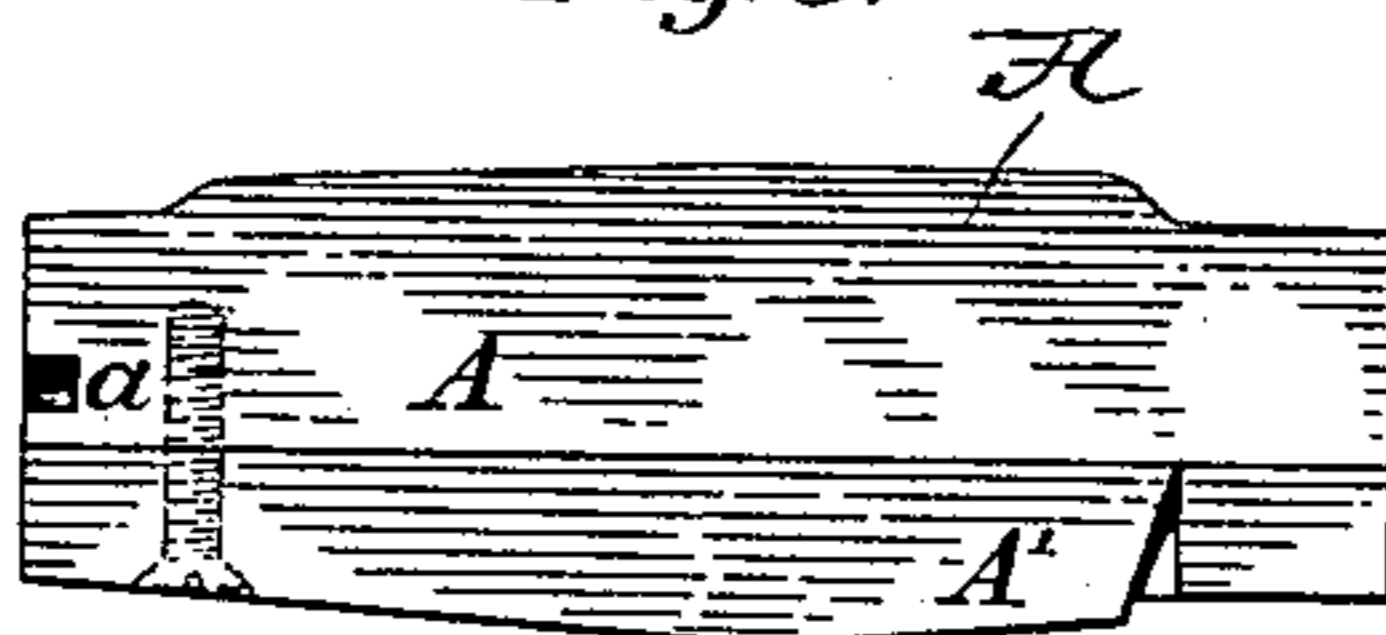


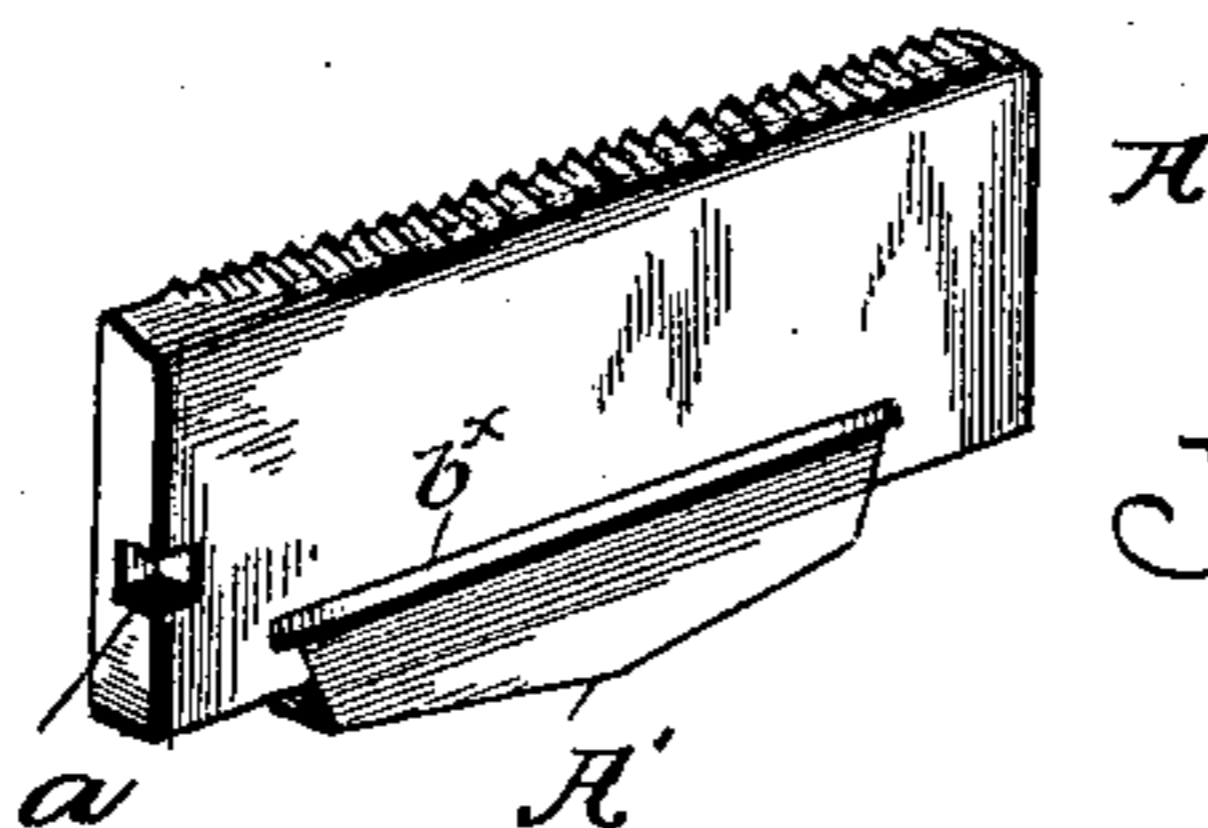
Fig. 4.



Fig 4^a

Witnesses:

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Inventor:

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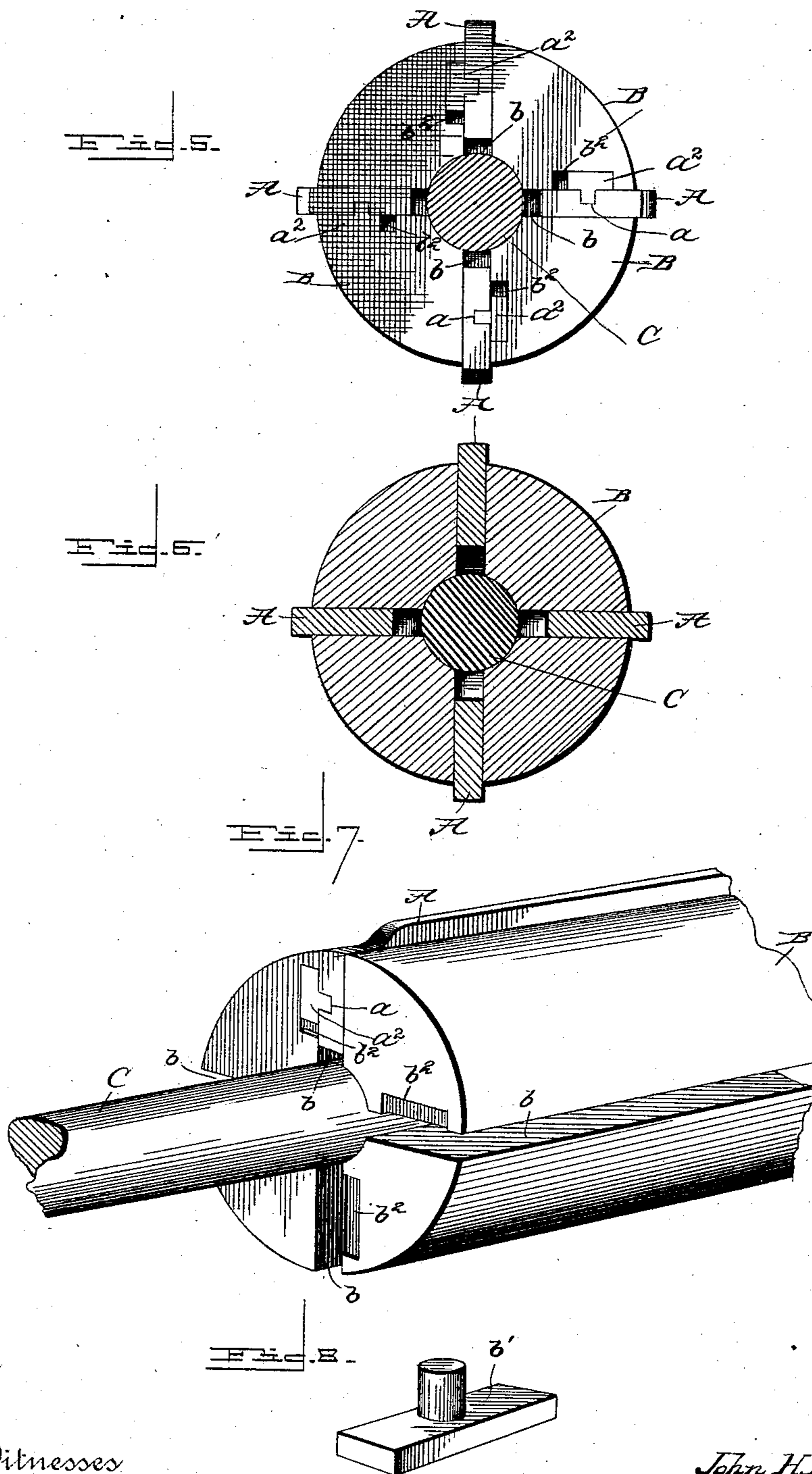
(No Model.)

2 Sheets—Sheet 2.

J. H. PHILLIPS.
EXPANDING REAMER.

No. 478,069.

Patented June 28, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN H. PHILLIPS, OF WHEELING, WEST VIRGINIA, ASSIGNOR OF TWO-THIRDS TO WILLIAM DAVIS, OF SAME PLACE, AND JOB ABLETT, OF PITTSBURG, PENNSYLVANIA.

EXPANDING REAMER.

SPECIFICATION forming part of Letters Patent No. 478,069, dated June 28, 1892.

Application filed October 3, 1889. Serial No. 325,853. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PHILLIPS, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Expanding Screw-Taps or Reamers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to expanding screw-taps or reamers.

The object of the invention is to produce an expanding screw-tap or reamer in which the dies are provided with a shoe designed to receive the impact of a mandrel upon its inner face. Furthermore, the object is to produce an expanding screw-tap or reamer of such construction as to permit a ready and free movement of the dies for the purpose of enlarging the openings or increasing the depth of the screw-thread to be cut without displacing the parts or lessening their effectiveness.

With these objects in view the invention consists, essentially, in an expanding screw-tap or reamer having its dies provided on their inner face with an adjustable shoe, said shoe being confined by metal extending from the die at one or both ends, preferably from the upper end, where most of the strain would come in the use of the tool.

The invention resides, furthermore, in a shank designed for the reception of dies, the shank being provided with suitable slots for their reception, into each slot being fitted an adjustable piece, in order that the portion of the dies lying longitudinal to the shank may be adjusted at will to provide for the adjustment of the dies to compensate for changes in the dimensions of the same arising from any cause, such as tempering.

The invention consists, furthermore, in an expanding screw-tap or reamer having a shank provided with slots for the reception of dies capable of moving into and out of the slots to expose more or less of the operating-surface.

I have illustrated the invention in the accompanying drawings, in which—

Figure 1 is a side view of the die constructed in accordance with my invention. Fig. 2 is a sectional view illustrating the die in position for use in a suitable shank and showing the mandrel bearing upon the inner face of the dies. Figs. 3, 4, and 4^a illustrate modified forms of dies. Fig. 5 is a cross-section on the line *xx* of Fig. 1. Fig. 6 is a similar view on the line *yy*. Fig. 7 is a detail view, in perspective, showing one of the dies in position; and Fig. 8 is a detail view of one of the adjustable blocks.

In the drawings, A designates a die provided on its outer face with a cutting-edge or with screw-threads and having in its inner face a recess for the reception of the shoe A'. The ends of the recess are by preference undercut or dovetailed, and the ends of the shoe are beveled in this instance to correspond to the contour of the recess, the difference between the size of the recess and of the shoe being such as to permit the introduction of liners *b*^x, whereby to prevent the dies from working loose when in use, and also to provide for the adjustment of the dies to compensate for changes in the dimensions of the same arising from any cause, such as from shrinkage, due to tempering. B designates the shank, which may be of any preferred construction and having a central bore designed to be engaged by a mandrel C, which latter bears against the inner faces of the shoes A'. The mandrel is provided with enlarged and reduced portions in order that the diameter of the cut may be regulated at will.

In order that the dies may be adjusted longitudinally in the slots *b* of the shank B, I provide blocks *b*', each having a pin or projection designed to engage an aperture in the ends of the dies to hold the blocks in position. Between the end of the shank and the blocks is interposed a suitable liner *b*^s, which liners may be of the desired thickness to accomplish the above-stated adjustment. The dies bear upon the blocks *b*', and when the latter have become worn out they may be replaced at but a slight cost.

In order to prevent the dies from falling out of the slots *b* when the reamer is removed

from the work, and also to provide a stop to limit the radial movement of the dies, I provide each die at the end opposite that carrying the blocks b' with a recess b^2 , Figs. 5 and 7, in which fits the head of a T-shaped key a^2 , the shank of which fits in a recess a in the side of the die. The recess b^2 is of greater length than the head of the key, as clearly shown in Figs. 5 and 7, and this difference in size between the head and slot permits the dies to have the desired radial play. A removable collar D on the shank bears against the ends of the dies and serves to keep the keys a^2 in place, but does not interfere with the radial movement of the dies. The collar is shown in this instance as being secured in position by means of screws d^2 , which bear upon the mandrel; but it is to be understood that any other suitable means may be employed for keeping the collar in place.

While I have particularly described the dies as provided with a dovetail-shaped recess for the shoes A' and the liners interposed between the shoes and the dies, I do not wish to be understood as limiting myself in this respect, as metal may be left at only one end to confine the shoe. If desirable, I may employ a construction illustrated in Fig. 3 of the drawings, wherein a screw is utilized for retaining the shoe in proper relation to the die and as being provided with an indentation or recess for

the reception of the shoe. This construction may be reversed and the shoe provided with an indentation to receive a projection from the die, as illustrated in Fig. 4.

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

1. An expanding screw-tap or reamer having its dies provided in their inner faces with an adjustable shoe, substantially as set forth.

2. A shank provided with radial slots and a die, each slot having an adjusting block or piece engaging with the die and adapted to confine liners between the ends of the dies and the shank for the longitudinal adjustment of the dies, substantially as set forth.

3. An expanding screw-tap or reamer comprising a shank having slots, the dies arranged in said slots, adjusting pieces or blocks movable in said shank and adapted to connect with said dies to limit the outward or radial movement of the dies, substantially as set forth, and a collar on the shank for keeping the said blocks in operative position.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. PHILLIPS.

Witnesses:

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