

(No Model.)

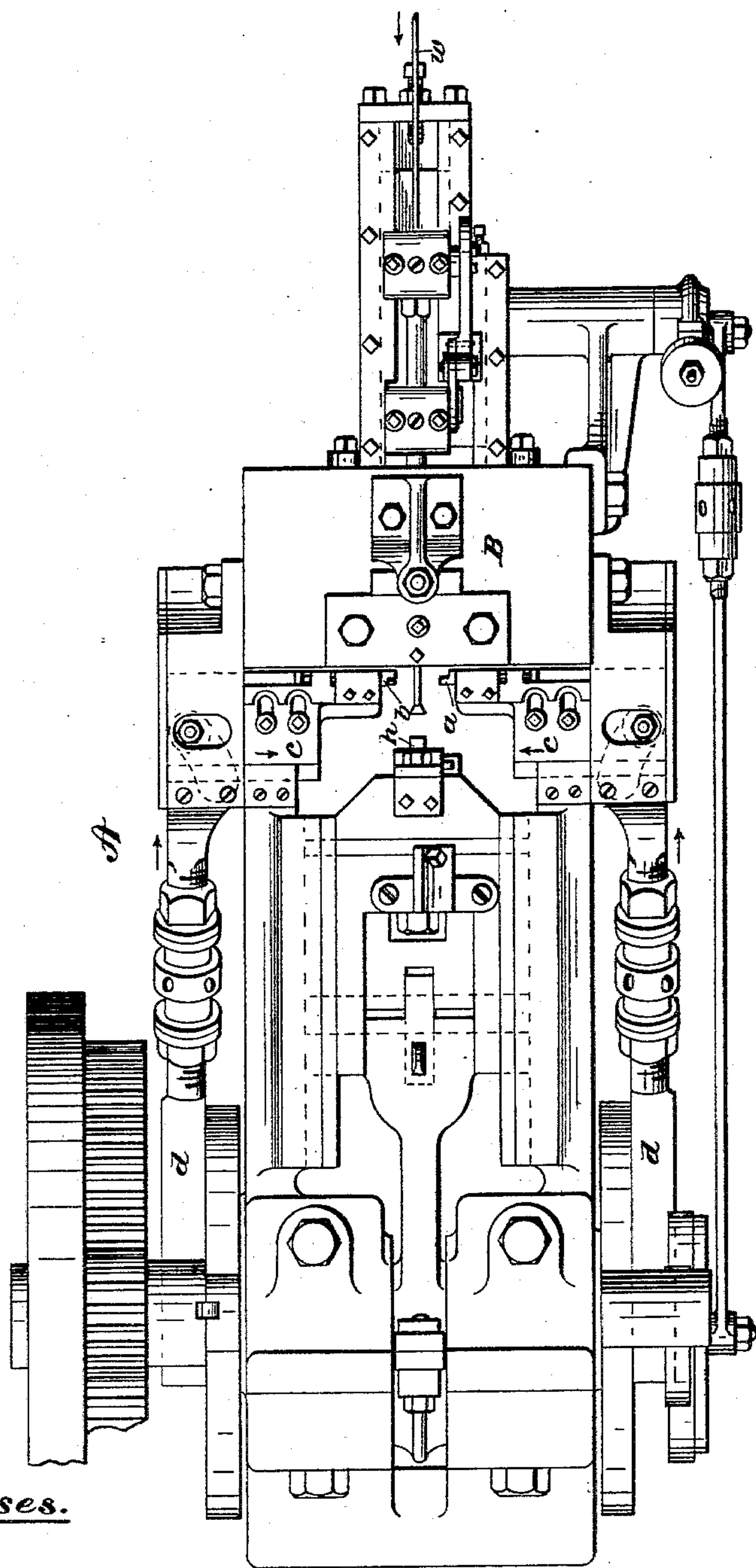
2 Sheets—Sheet 1.

C. D. ROGERS.

CUTTING-OFF DIE FOR MACHINES FOR MAKING SCREW BLANKS.

No. 563,885.

Patented July 14, 1896.



Witnesses.

Fred. Arnold.

Harold Senior

Inventor.

Charles D. Rogers.

by Remington T. Henthorn
Atty.

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2 Sheets—Sheet 2.

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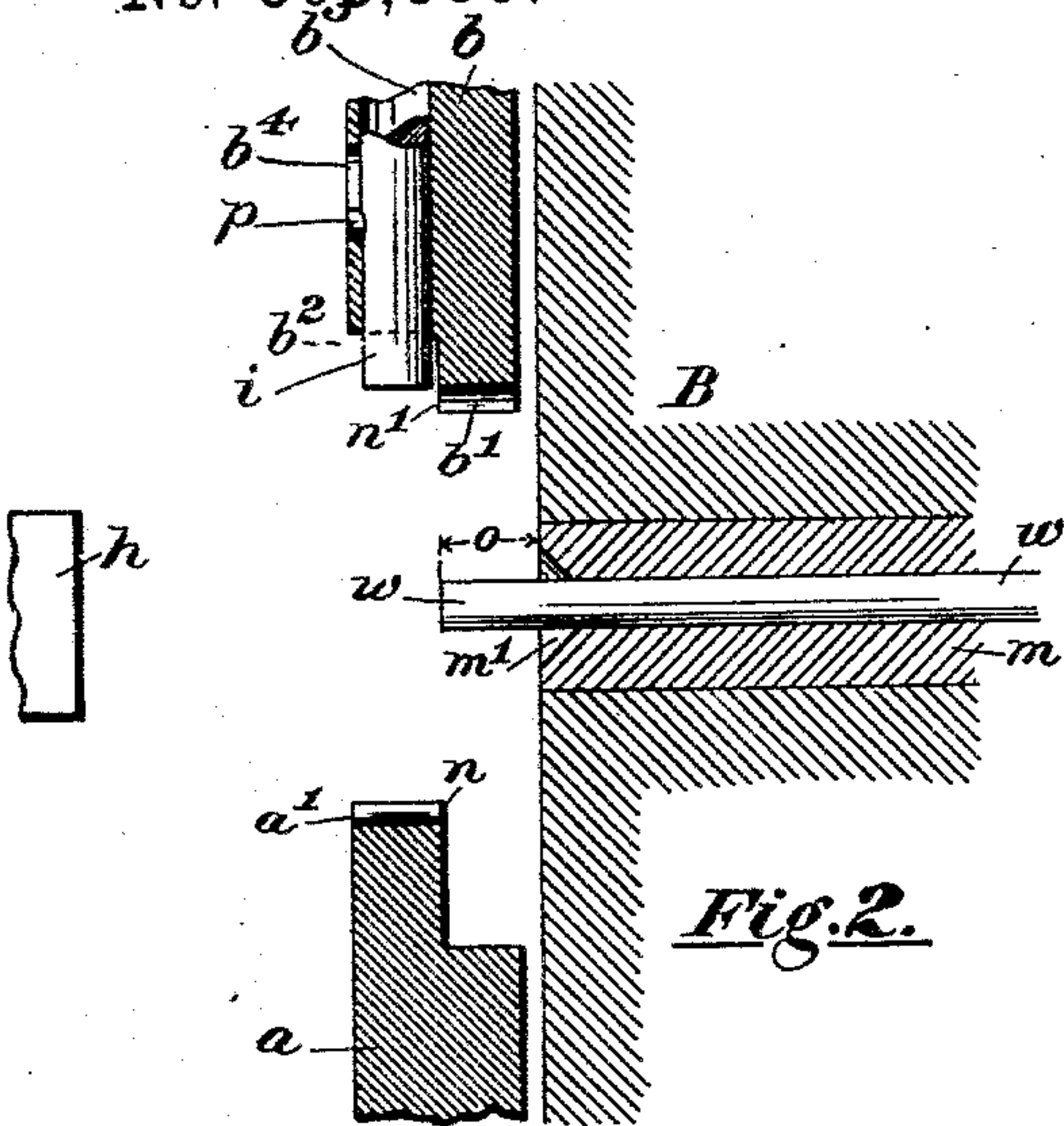


Fig. 2.

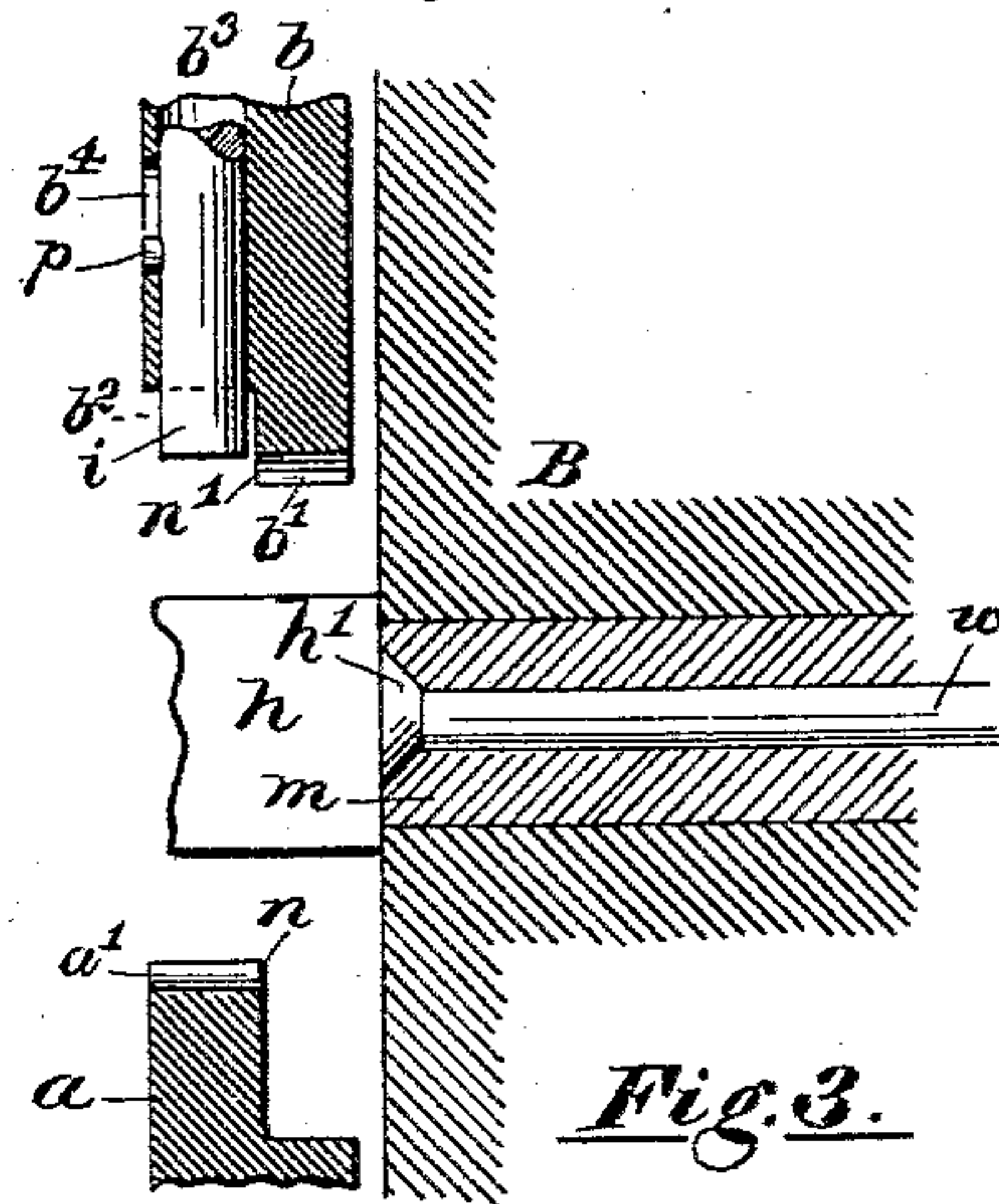


Fig. 3.

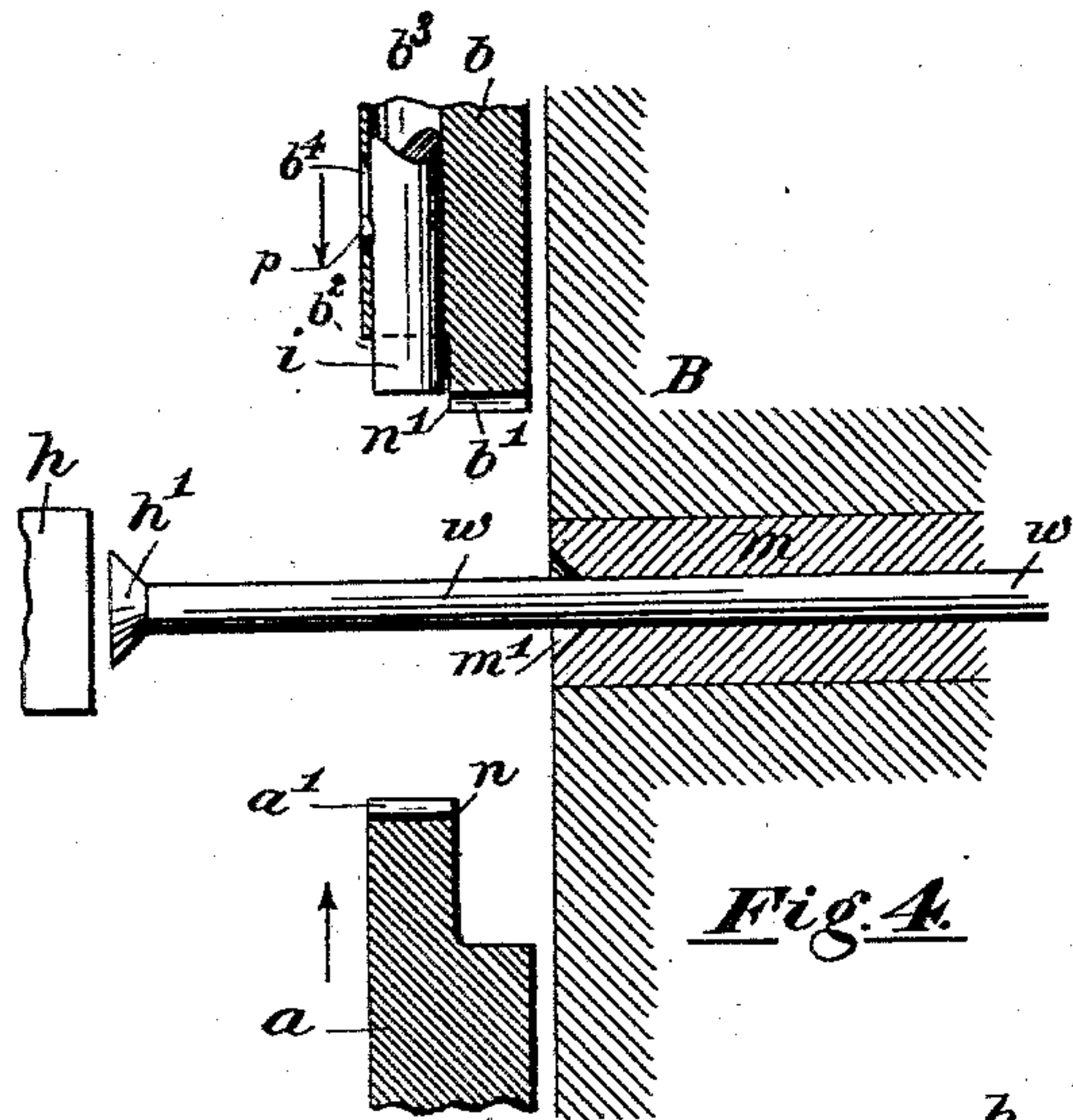


Fig. 4.

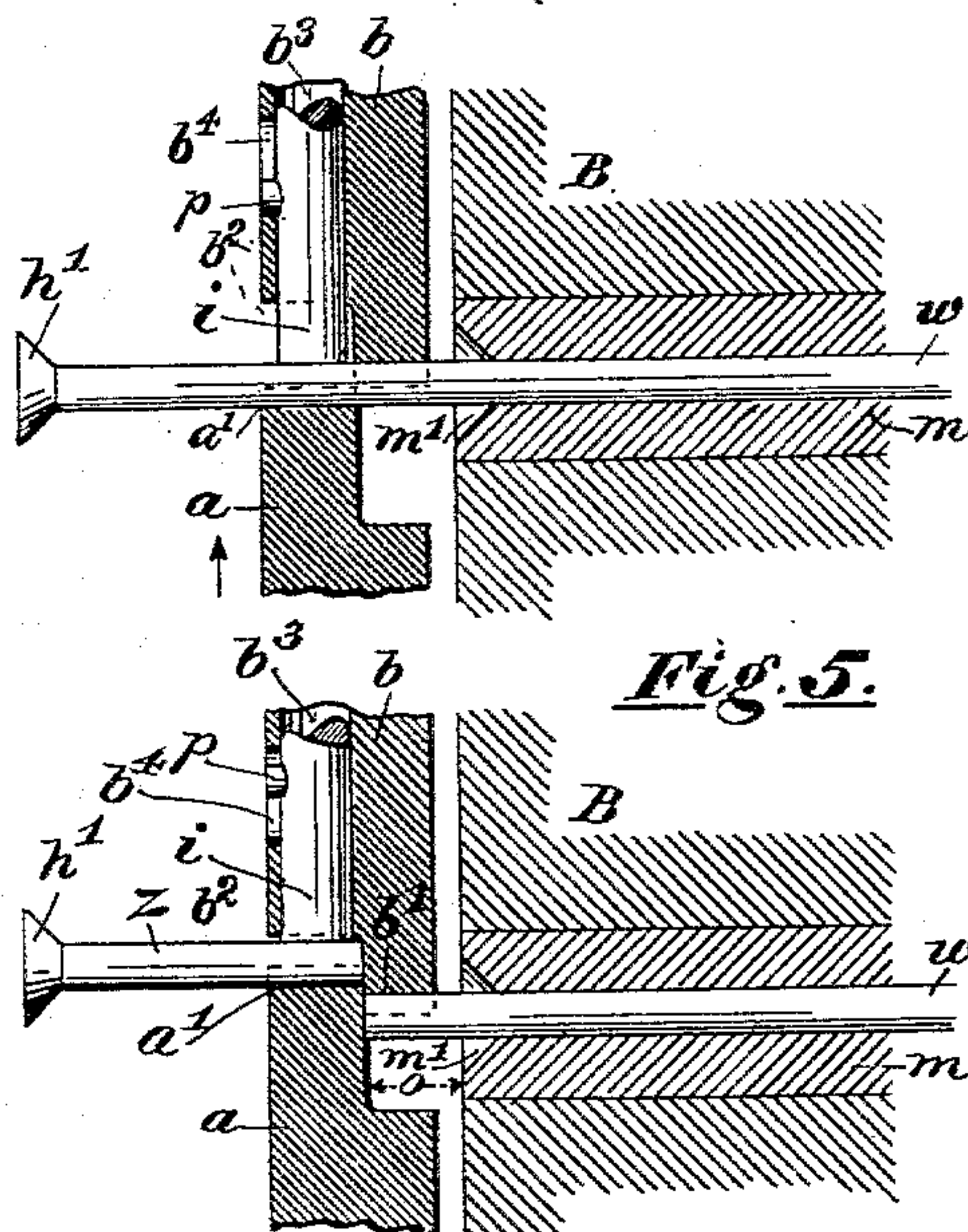


Fig. 5.

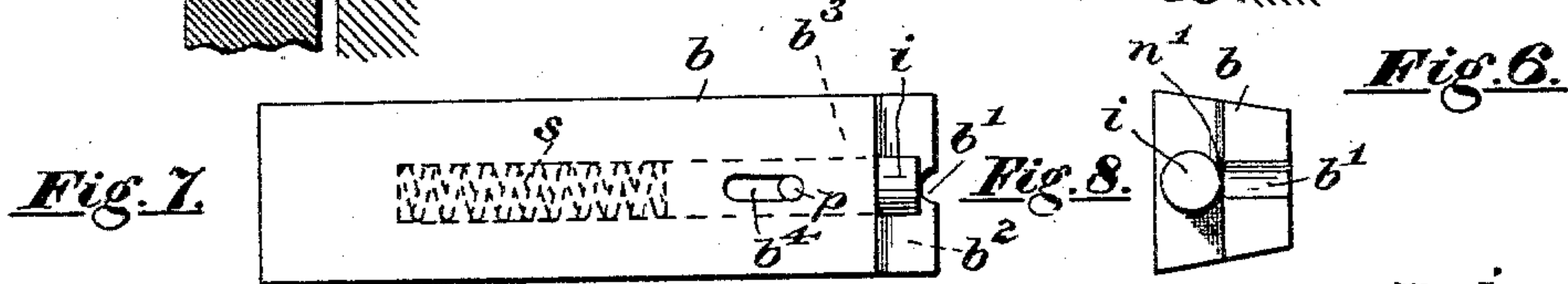


Fig. 6.

Fig. 7.

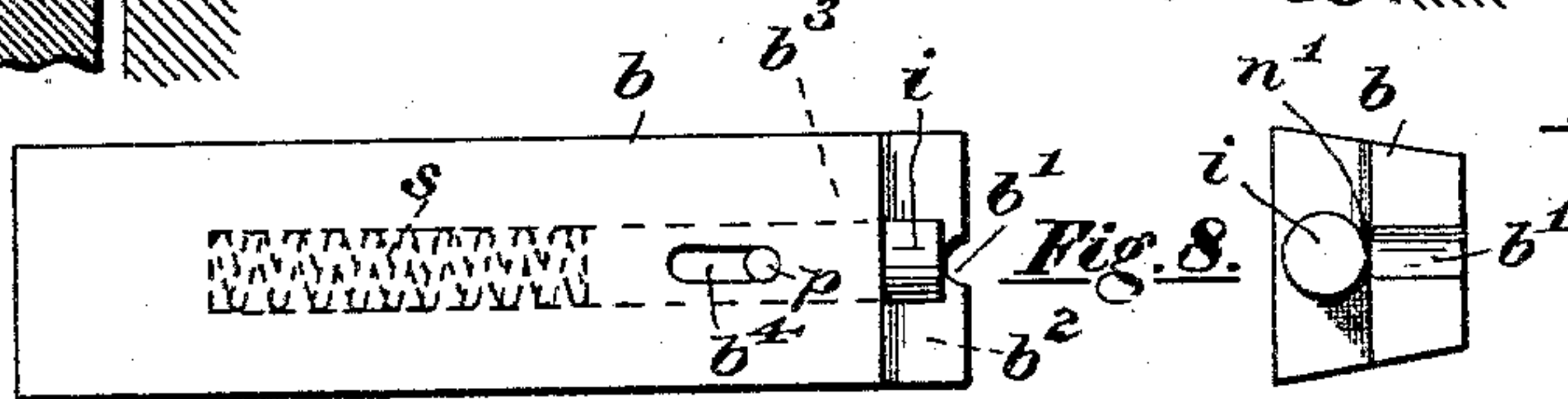


Fig. 8.

Fig. 10.

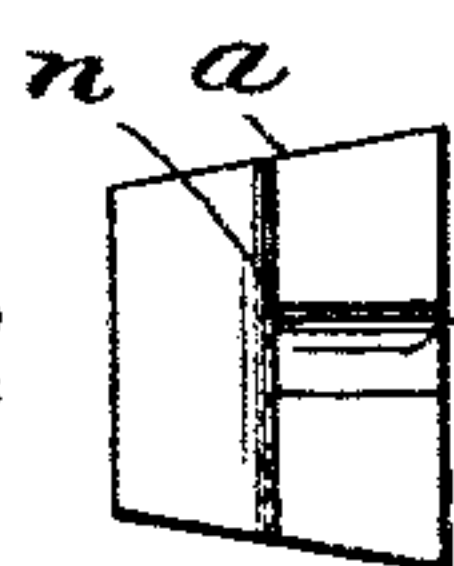


Fig. 9.

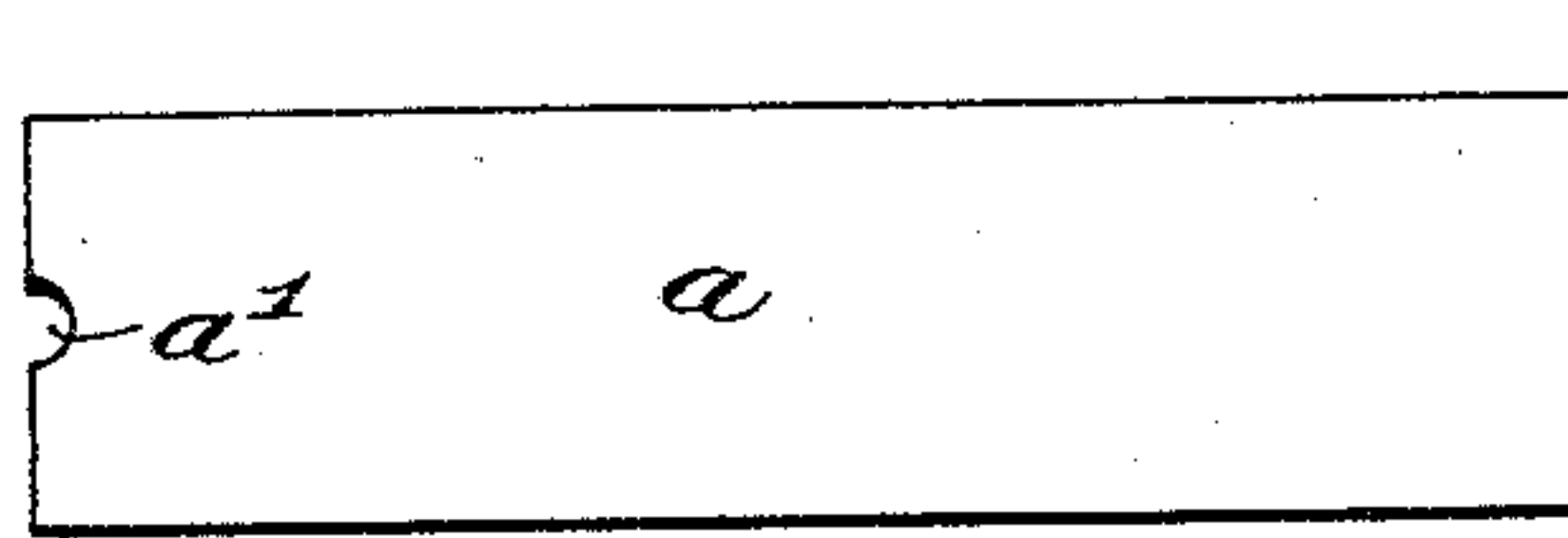


Fig. 11.



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UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND.

CUTTING-OFF DIE FOR MACHINES FOR MAKING SCREW-BLANKS.

SPECIFICATION forming part of Letters Patent No. 563,885, dated July 14, 1896.

Application filed June 18, 1895. Serial No. 553,203. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. ROGERS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Cutting-Off Dies for Machines for Making Screw-Blanks, &c.; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention relates to the class of machines for making headed screw-blanks or other blanks from a continuous length of wire or rod—that is to say, machines in which the forward end of the wire operated upon is first upset or swaged in the heading-die to form a head, the headed wire being next advanced through the heading-die the desired distance and finally severed by a pair of co-acting dies working at right angles with the longitudinal axis of the wire, at the same time leaving a length of wire protruding through the heading-die to be formed into a head, as before stated.

Machines of the above class differ from those in which the length of wire forming the blank is first sheared off while in the stationary feeding-die by means of a combined cutting-off die and carrier forced across its face, which at the same time transfers the severed blank to a heading-die, where it is then forced into the latter, then headed and finally ejected from it before the next succeeding length of wire can be brought into position. In such last-named machines it will be seen that the ends of the wire are or may be cut squarely across, because the mouth of the feeding-die is not enlarged or recessed and the shearing side of the cutting-off die works in close proximity to the face of the fellow or feeding-die; and since the wire is guided and supported throughout the length of the feeding-die to the actual point of severance it follows that the wire will not become bent or deflected. Consequently the head produced will be true and central.

The object I have in view is to provide

blank-making machines of the class first referred to with means whereby the portion of wire extending in front through the recessed heading-die can be cut or severed squarely across at any point in its length, the standing portion of the wire at the same time being rigidly supported. By means of my improvement the blank is not severed in one die and then transferred to another die to be headed, but instead the end of the wire is headed before the blank is severed from it, the feeding and heading being effected in one die only. While this feature, broadly considered, is not new, as may be seen in United States Patent No. 386,091, issued July 10, 1888, it will be observed that in that machine the points of the screw-blanks made therein are cone-shaped, the cutting-off dies being reversely arranged and working simultaneously upon opposite sides of the wire. Moreover, cutting-off dies as usually made cannot be employed in such types of patented machines for transversely severing the wire, whereby the point end of the blank as well as the end of the standing wire are cut squarely across simultaneously and without waste of stock.

In carrying out my improvement in blank-making machines provided with a fixed die through which a continuous length of wire is intermittently fed, I employ a member arranged in front of said fixed die capable of being brought into engagement with the side of the projecting wire and forming a rigid rest therefor, and also forming a shearing member provided with a combined yielding guide and support for the wire, with respect to the said shearing portion, in combination with an oppositely-arranged fellow shearing or cutting-off die adapted to be forced transversely across the wire, thereby severing the headed blank from the length of wire, the blank portion at the same time being supported by the said resilient guide, which latter moves by and in unison with the cutting-off die, all as will be more fully hereinafter set forth and claimed.

In the accompanying two sheets of drawings, Figure 1, Sheet 1, represents a plan view of a blank-making machine provided with the improved cutting-off dies forming the subject of my present invention. Fig. 2, Sheet 2, is an enlarged horizontal sectional

view taken substantially through the center of the combined heading and feeding die and the adjacent portions of the cut-off dies, showing a length of wire extending beyond the face of the feeding-die and adapted to be converted into a head by swaging it into the recessed portion of the die, the several parts being in the normal position. Fig. 3 is a similar view showing the head formed on the end of the wire by the action of the heading-hammers. Fig. 4 shows the relation of the parts after the headed wire has been forced ahead from the die the proper distance, the cutting-off dies advancing toward each other. Fig. 5 shows the combined shearing and guide member of the severing-dies stopped at the instant of its engagement with the headed wire, the other die member advancing. Fig. 6 shows the blank severed from the wire by the action of the last-named die member, thus completing the operation. Fig. 7 is a side elevation of the combined guide and shearing member. Fig. 8 shows the front end of the same. Fig. 9 is a side elevation of the other or main shearing member. Fig. 10 is a front end view of it, and Fig. 11 is a partial side view of the yielding guide slightly modified.

A, again referring to the drawings, represents in plan view a machine well adapted for making screw-blanks and is substantially the same as the patented machine hereinbefore referred to. Another analogous machine is set forth in United States Patent No. 389,169, dated September 4, 1888.

In the drawings, Fig. 1, the machine is represented as provided with oppositely-located holders *c* in which my improved cutting-off dies *b a* are adjustably secured. These holders are capable of being moved toward or from each other through the medium of movable cam connections *d*. The continuous length of wire *w* from which the blanks are to be cut is intermittently fed or advanced by any suitable device through a die *m*, (see Sheet 2 of the drawings,) mounted in the head portion B of the machine. As drawn, said die *m* may be termed a "combined feeding and heading die," since its outer or front end is recessed at *m'*, the shape of said recess obviously being the counterpart of the head to be swaged therein on the adjacent end of the standing wire, the swaging being effected by means of suitable heading-hammers *h*, which are mechanically forced into engagement with the end of the wire for the purpose.

In my improved cutting-off dies *a b*, the latter may be termed the "combined supporting and anvil member." Its front or working end is grooved transversely at *b'* to fit, say, the semidiameter of the wire operated upon and form a fixed anvil therefor when in use. The outer end *n'* of the grooved portion, that is, the end farthest from the face of die *m*, is hardened and tempered and adapted to form a shearing part in conjunction with the fellow die *a*. The outer or

front portion of the die *b* is drilled longitudinally. In the hole *b³* thus formed a cylindrical guide *i* is movably fitted. The latter, as drawn, is provided with a stop *p*, extending into a slotted opening *b⁴*, formed in the side wall of the die, the arrangement of the parts being such that the front end of the guide, when in the normal position, is flush with or a little in advance of the bottom of said groove *b'*. The guide is made resilient by the use of a comparatively stiff spring *s*, mounted in the hole *b³* and bearing against the rear end of the guide. (See Fig. 7.) The end of the die is cut away at *b²*, thus exposing the outer portion of the guide and also providing for the passage of the working end of the fellow die *a*.

The cutting-off die member *a* is located on the opposite side of the machine with respect to the said member *b*. Its working end is provided with a groove *a'*, substantially like that formed in die *b*. The end *n* of the groove *a'* nearest the face of die *m* is adapted to form a cutting edge, so that as the die is forced ahead against the standing wire (the latter being supported by the opposed and for the time being stationary die *b*) it acts to shear the wire, the continued movement of die *a* completely severing the wire smoothly and squarely, the guide *i* at the same time yielding rearwardly and carrying between them the headed blank *z*. (See Fig. 6.)

Now, assuming a blank-making machine to be provided with my improved dies *a b* and that the wire *w* projects through the feeding-die *m* a distance *o*, as shown in Fig. 2, the operation of producing a headed blank would be substantially as follows: The suitably-actuated hammer or hammers *h* upset the end of the wire into the die-cavity *m'*, thereby forming a head *h'* thereon, as shown in Fig. 3. The thus-headed end portion of the wire is then forced endwise from the die and fed ahead the desired distance, the cutting-off dies *a b* at the same time being advanced toward each other, as shown in Fig. 4, the movement of the die *b* ceasing at the instant it and the guide *i* fairly engage the side of the standing wire, as shown in Fig. 5. The continued forward movement of the other die member *a* acts to completely shear off the wire and carry the headed blank *z* slightly past the rest or anvil portion of the die *b*, as shown in Fig. 6.

It will be seen that while the severed ends of the wire are being cut squarely across the combined action of the grooved seat *a'* and the opposed face of the yielding guide *i* serve to hold the blank portion firmly between them, thereby keeping the blank true and straight. Upon separating the dies the finished blank drops from them, the relation of the parts then being, as shown in Fig. 2, ready for the production of the next succeeding blank.

The face of the supporting-guide *i* may, if

desired, be grooved, as at i^2 , Fig. 11, to receive the wire. My improved dies are well adapted to be used for cutting off wire having other forms cross-sectionally, the working
5 faces of the dies in such cases being correspondingly changed or modified.

It is to be noted that in a machine provided with my improved dies a b the wire can be cut off true and square and at any desired
10 distance beyond the face of the feeding-die m without bending or springing the wire in the least degree. Moreover, the blanks themselves are kept perfectly true and straight during the severing operation.

15 I claim as my invention—

1. In a machine for making blanks from a continuous length of wire, the combination, with a fixed die through which an end of the wire is fed, of a pair of oppositely-arranged
20 movable cutting-off dies, as a , b , capable of severing the wire squarely across at a point beyond the face of the first-named or fixed die, one of the said cutting-off dies, b , when in use being in non-yielding engagement with
25 the wire and forming an anvil therefor and provided with a yielding guide, as i , and having the grooved or adjacent faces of said guide and the fellow die member a adapted to snugly hold the wire between them while the blank
30 is being severed, the said anvil b at the same time rigidly supporting the end portion of the standing wire against lateral movement, substantially as described.

2. In a machine for making screw-blanks
35 from a continuous length of wire, the combination, with a die provided with a cavity in which the heads are to be formed and through which the wire is intermittently fed, of an anvil die member for supporting the projecting portion of the wire laterally during
40 the shearing operation and having a yielding

guide, as i , mounted therein capable of engaging the wire, and a cutting-off die member, as a , arranged to coact with the said supporting die member in severing the wire, 45 the said guide at the same time being opposed by the die a and moving in unison with the latter while the headed portion of the wire is held between them, and mechanism both for forcing the said anvil and cutting-off die together and then separating them, for the purpose set forth. 50

3. A pair of cutting-off dies, a , b , capable of severing wire squarely across at any desired point, one of said dies, b , forming an anvil and having its working face arranged to support the wire laterally while it is being severed and provided with a resilient guide, as i , adapted to engage the wire and to be forced rearwardly with respect to said die, 60 substantially as described.

4. The pair of cutting-off die members, a , b , hereinbefore described, each having its working face grooved transversely to receive and support the wire in a lateral direction 65 and having the adjacent edges of the working faces sharpened and adapted to shear the wire squarely across upon forcing the said cutting edge of the member a past that of the fellow member, b , the said member having its working end cut away, as at b^2 , contiguous to the shearing edge and provided with a yielding guide i having a stop for limiting its outward movement, substantially as and for the purpose hereinbefore set forth. 75

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

CHARLES D. ROGERS.

Witnesses:

GEO. H. REMINGTON,
FREDERIC ARNOLD.