

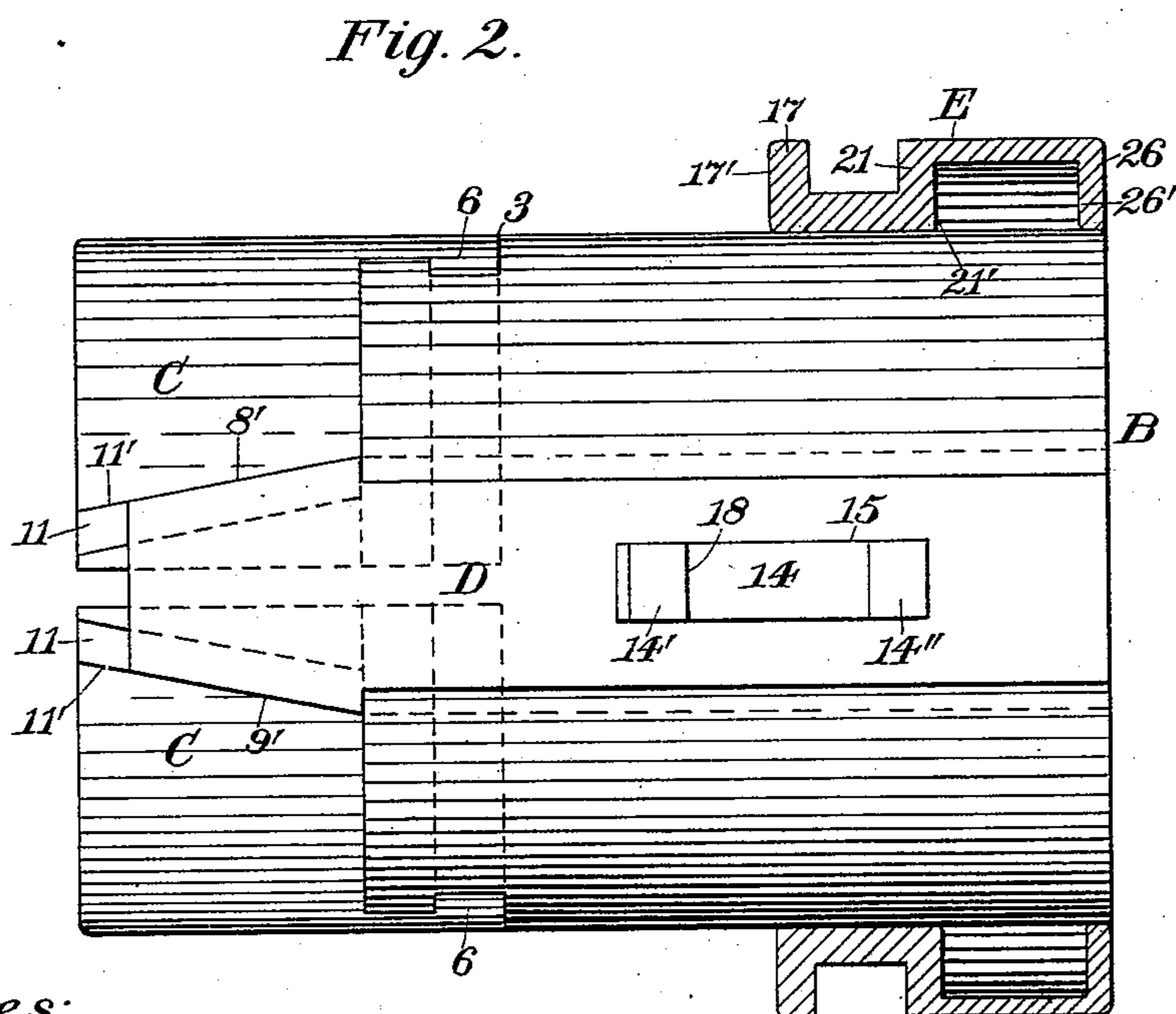
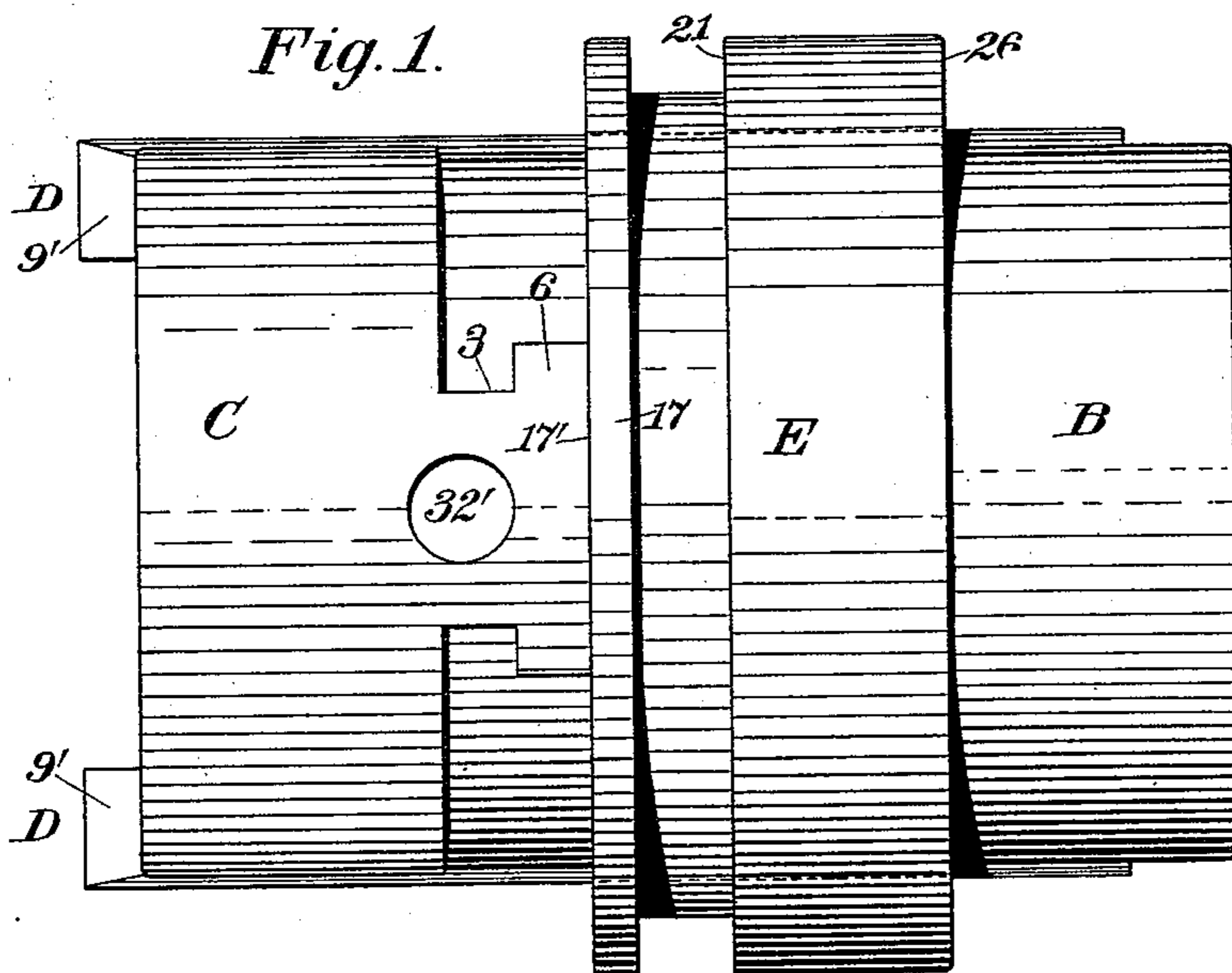
(No Model.)

3 Sheets—Sheet 1.

F. H. RICHARDS.  
BOLT CUTTER HEAD.

No. 532,818.

Patented Jan. 22, 1895.



Witnesses:

J. L. Edwards Jr.  
Fred. J. Dole.

Inventor:

F. H. Richards

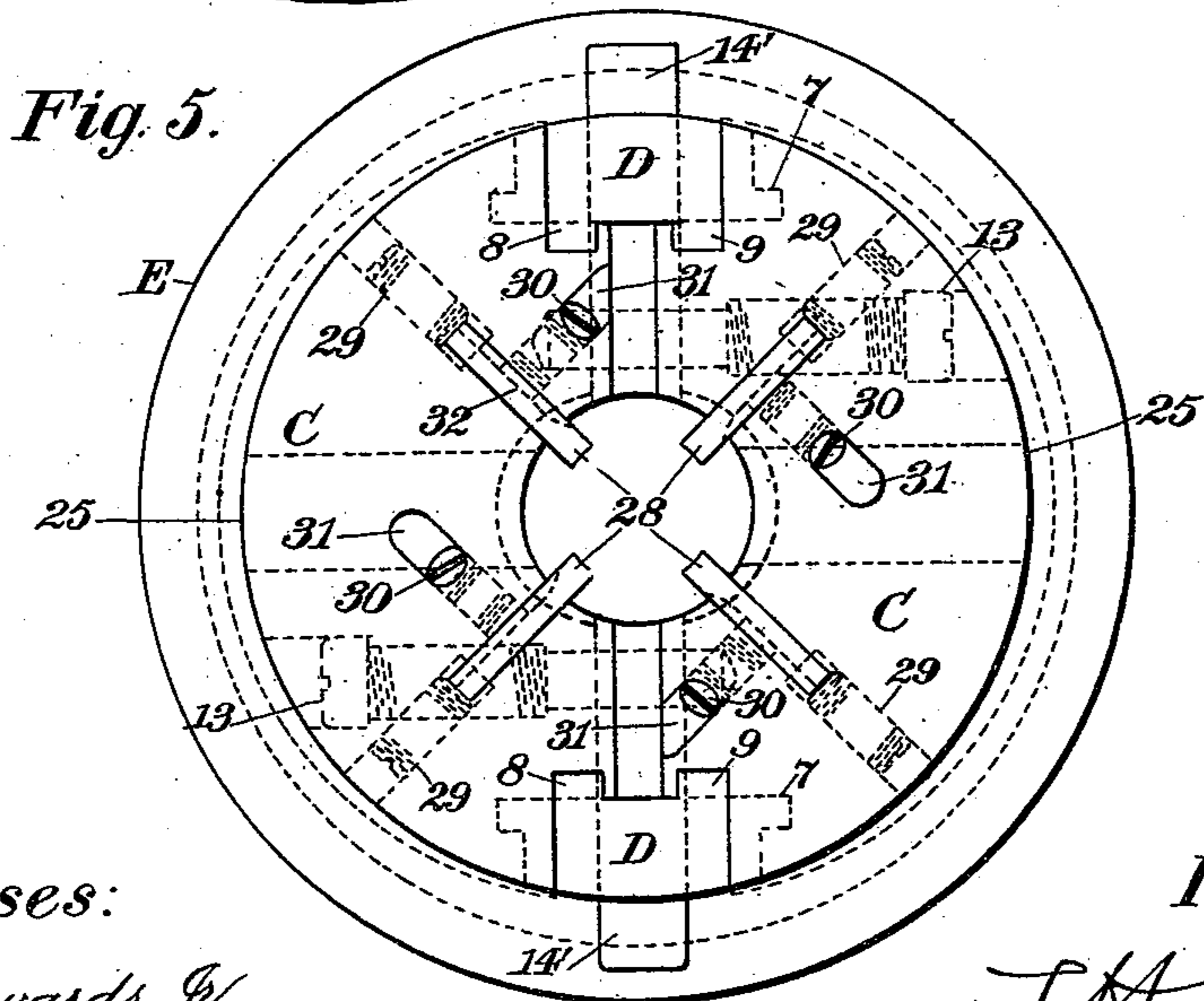
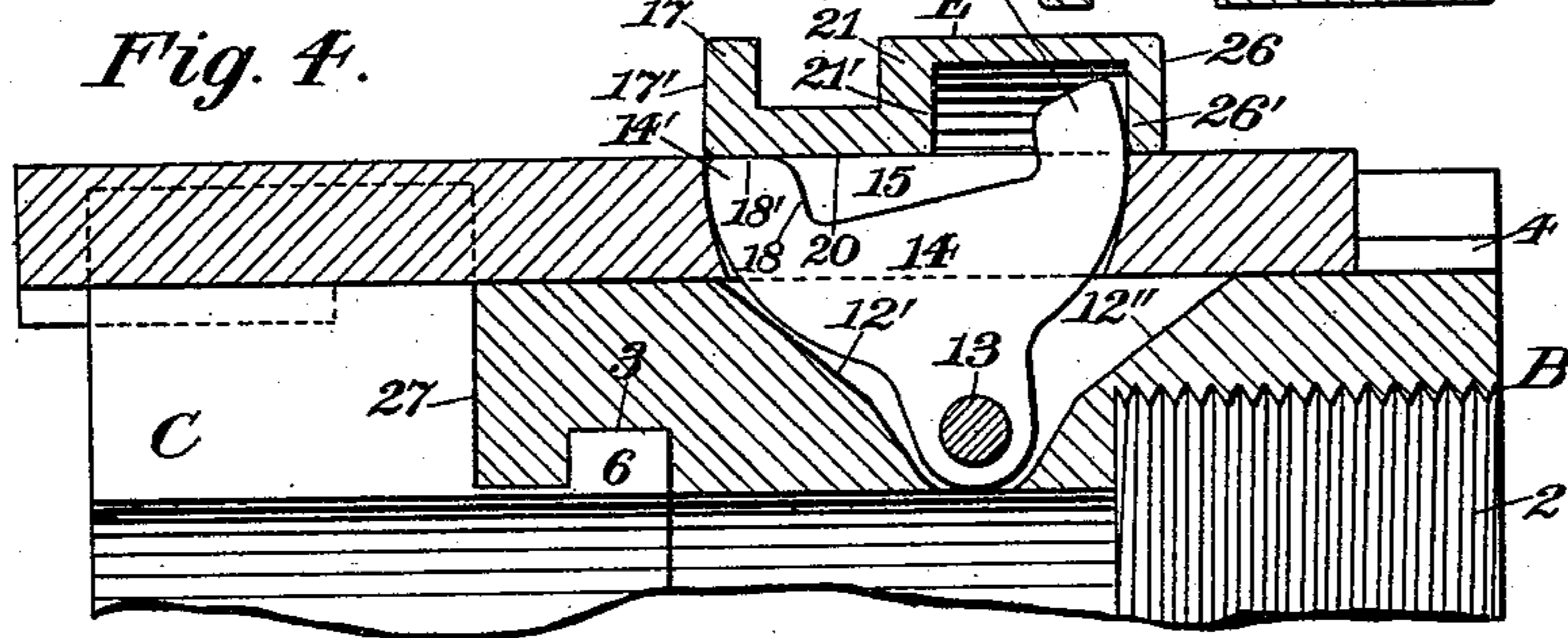
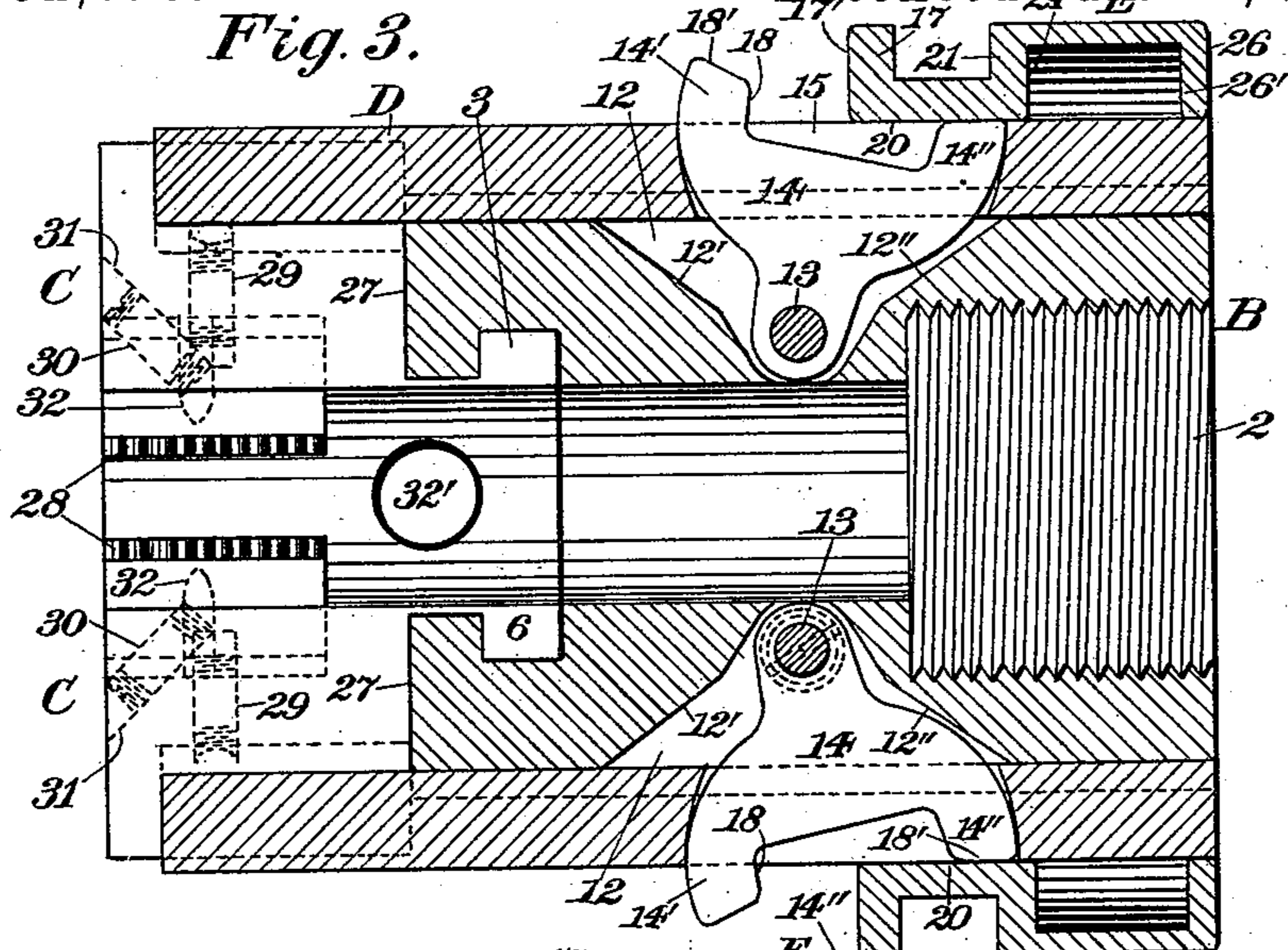
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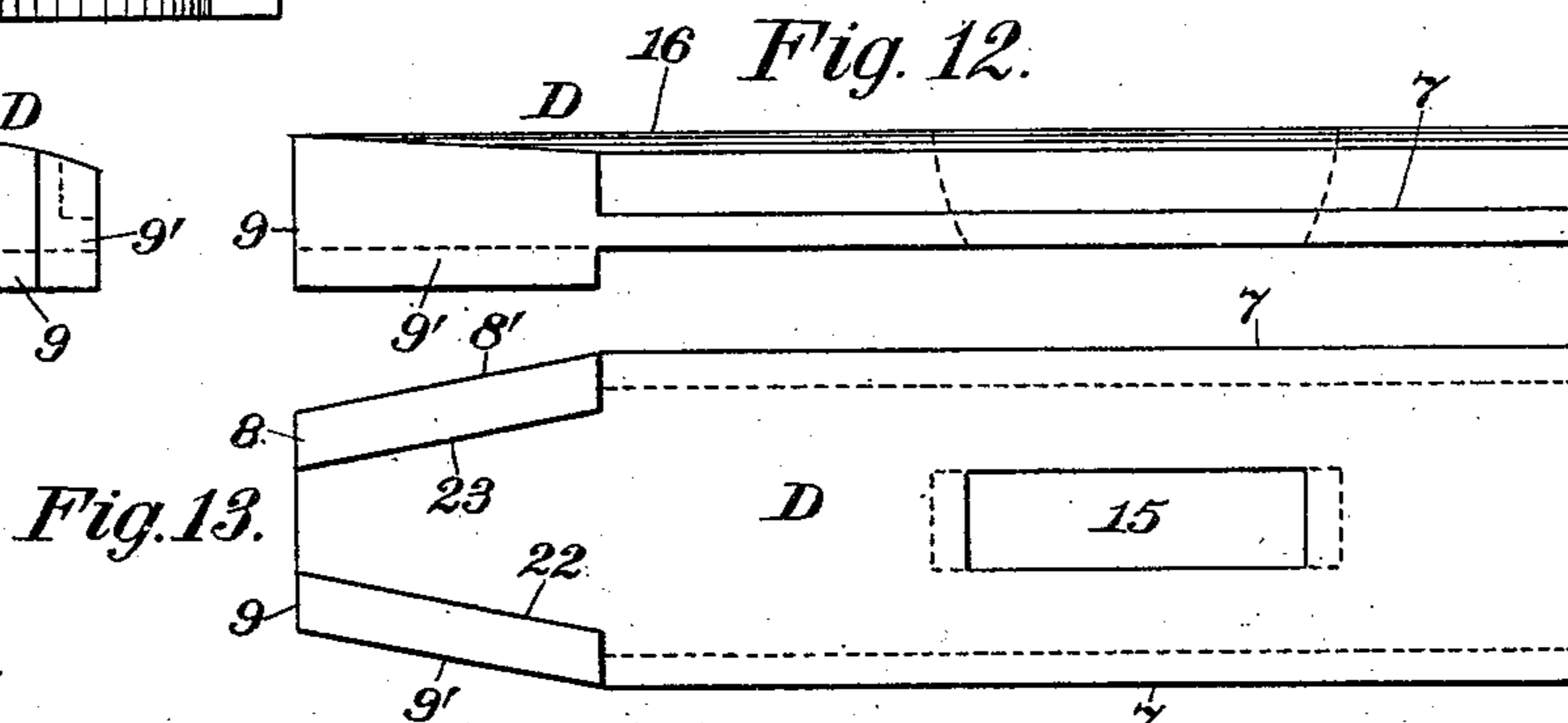
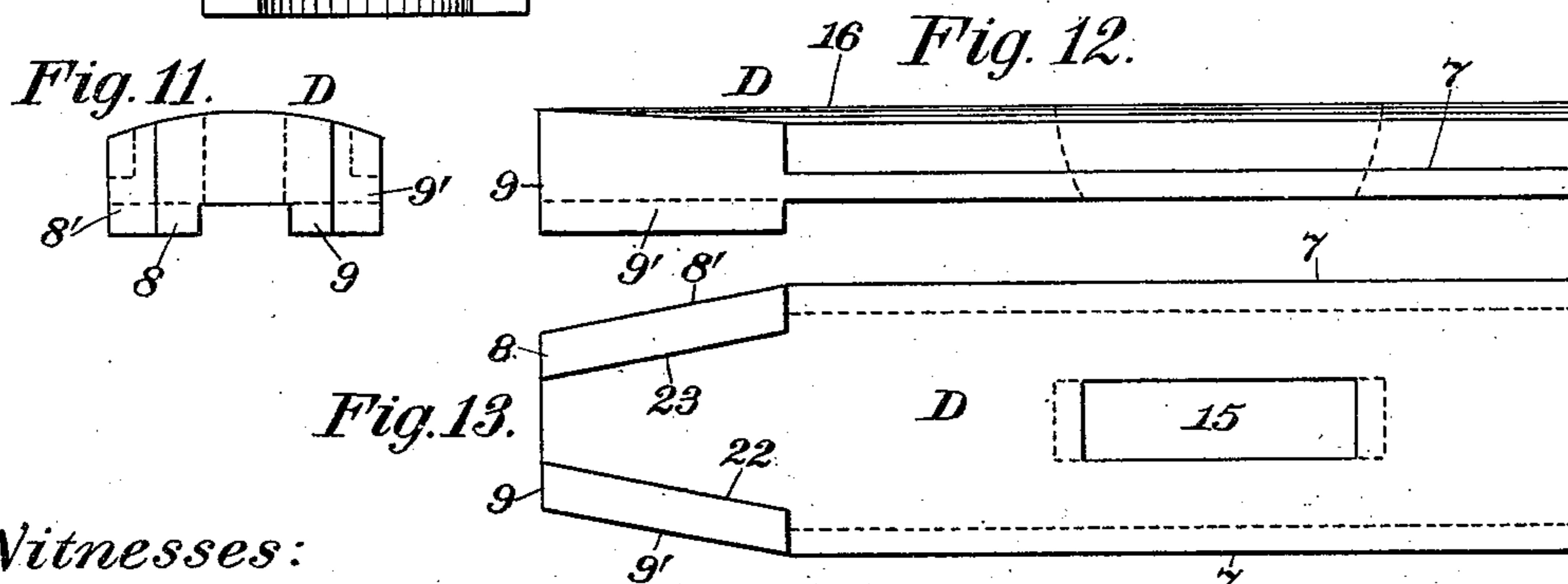
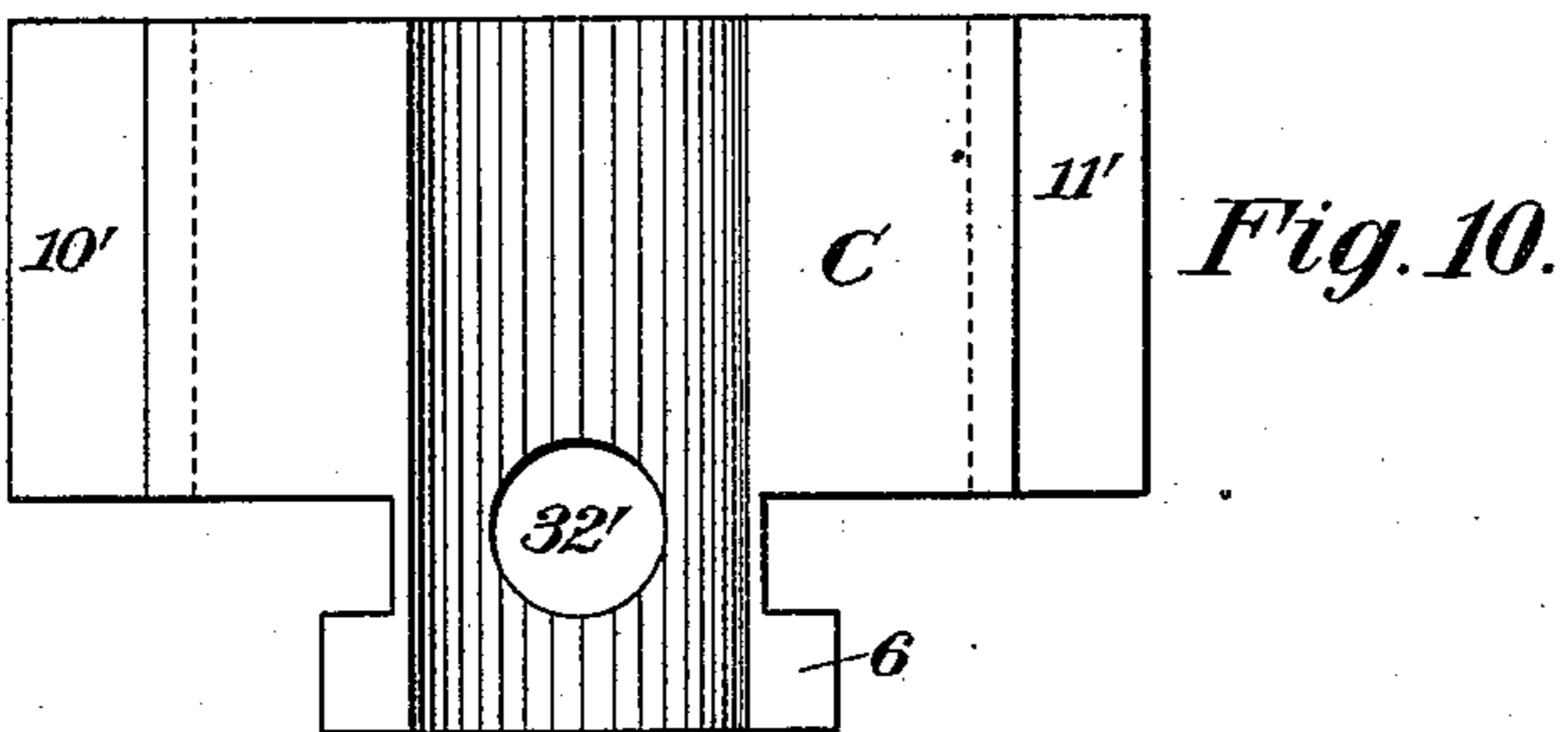
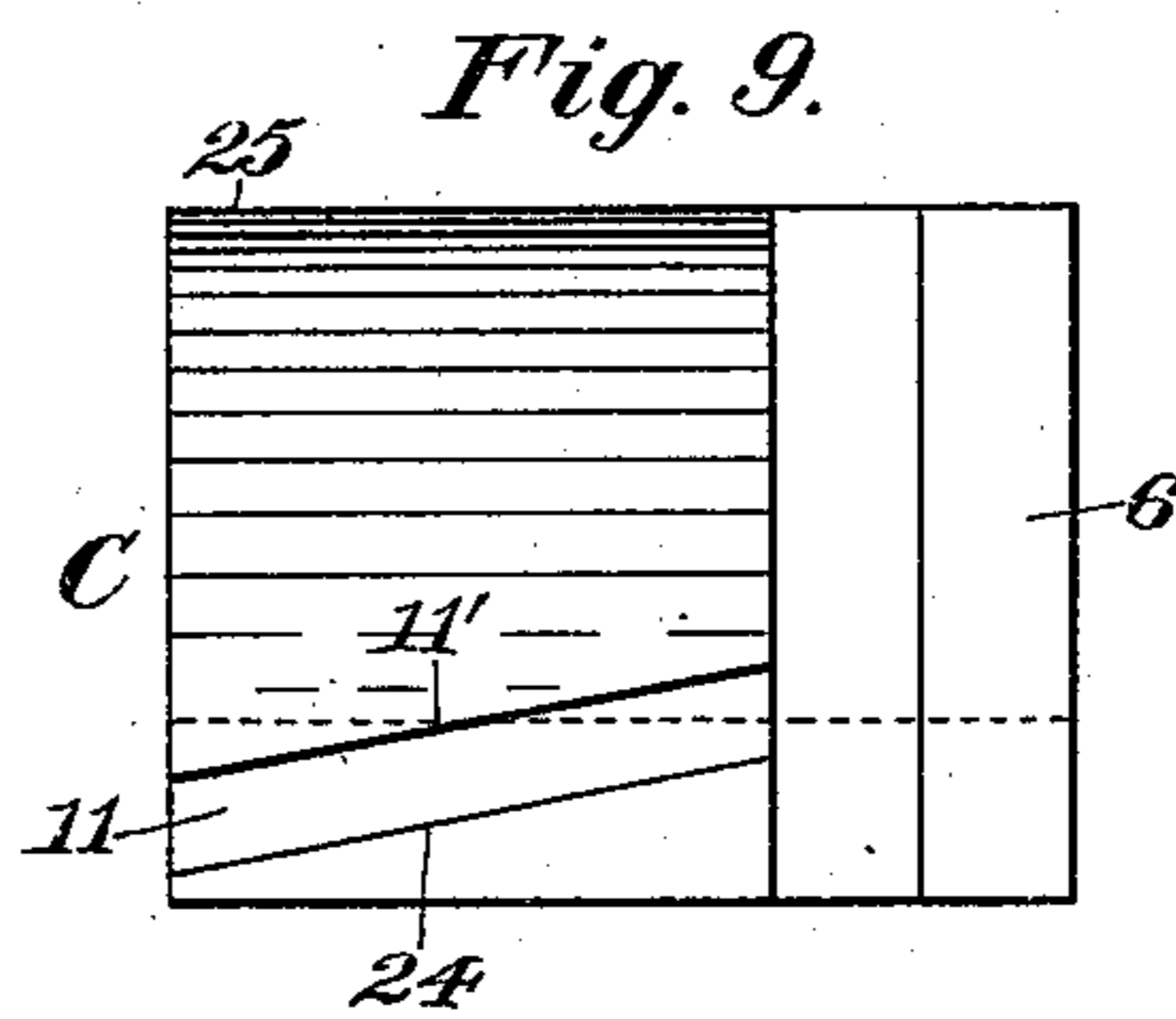
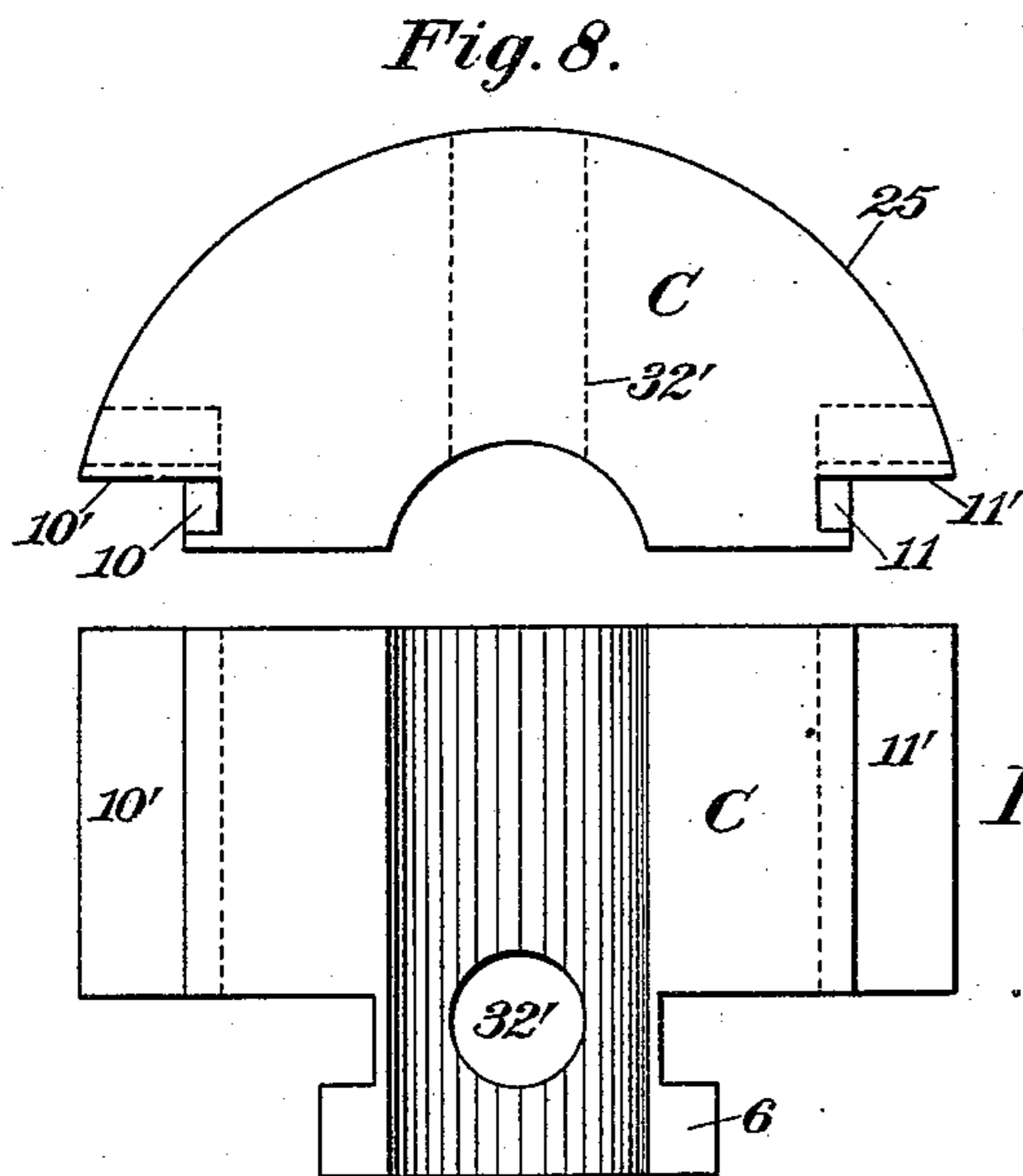
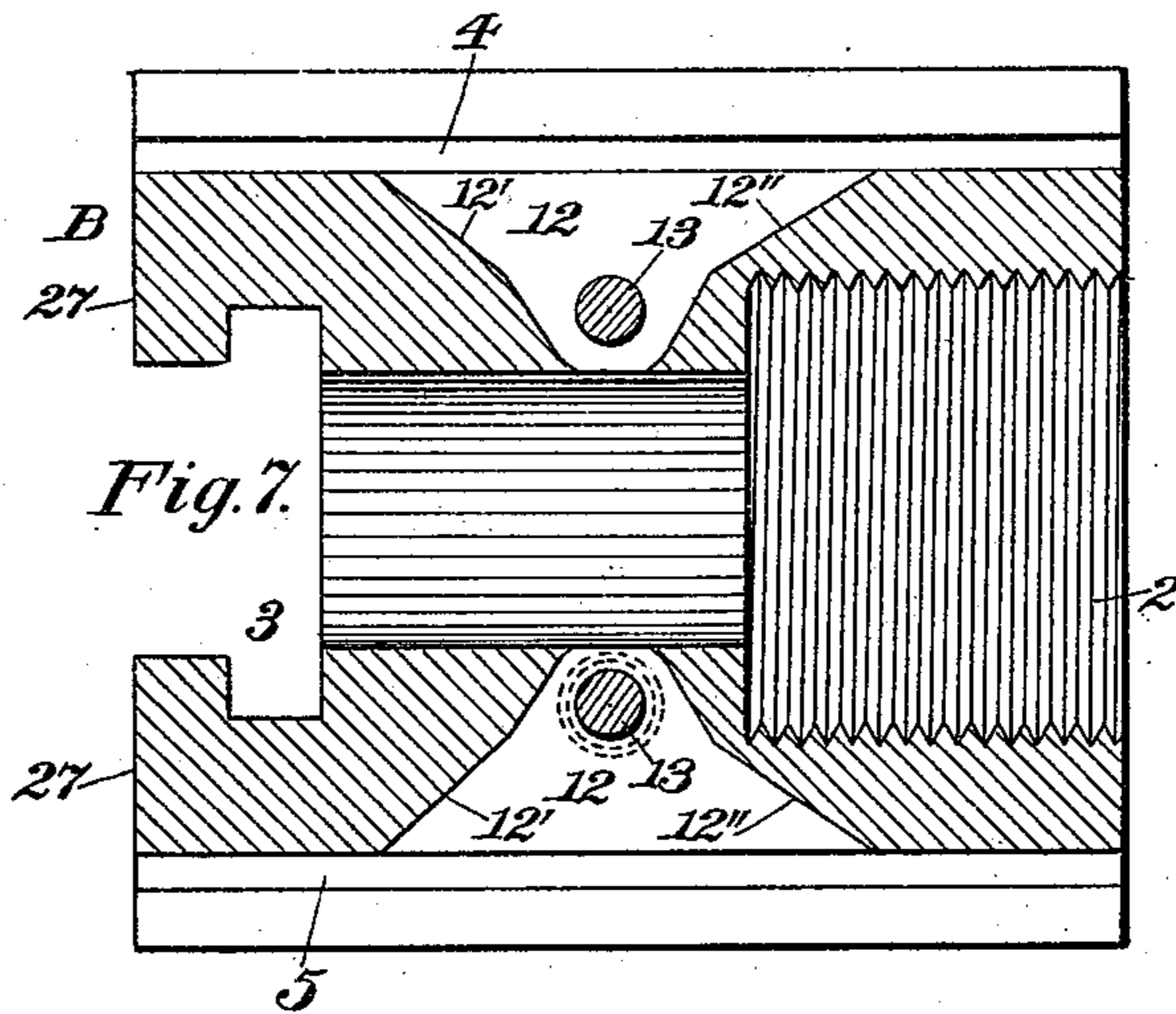
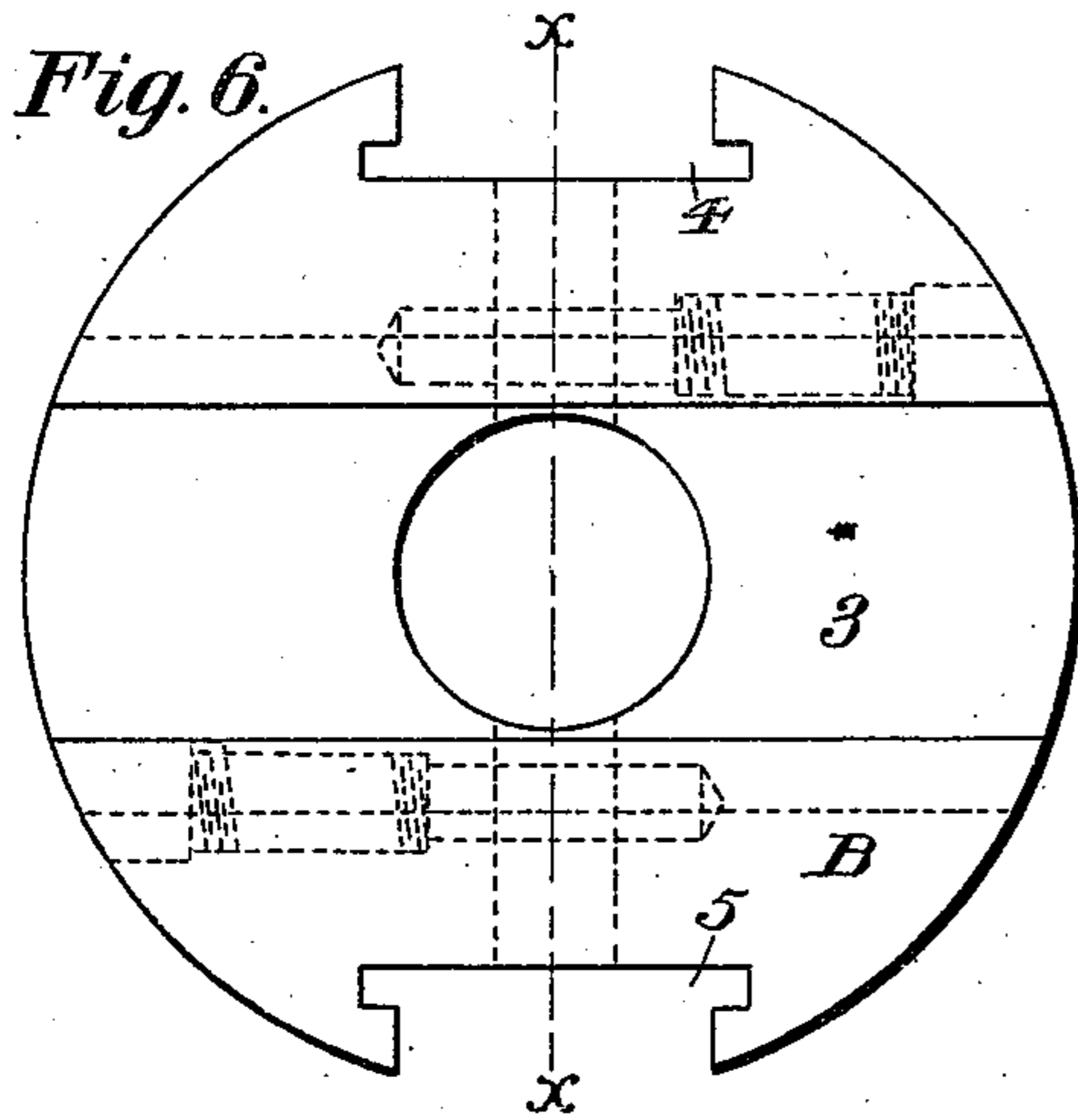
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# UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

## BOLT-CUTTER HEAD.

SPECIFICATION forming part of Letters Patent No. 532,818, dated January 22, 1895.

Application filed July 30, 1894. Serial No. 518,966. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Bolt-Cutter Heads, of which the following is a specification.

This invention relates to improvements in heads for bolt-cutters and like machines, the object being to provide a head of the self-opening type, which shall have a practically rigid interconnection of its sliding parts and be for all practical purposes a substantially rigid body, both in its open and closed positions.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of a bolt-cutter head constructed in accordance with my present invention and showing the parts in their open positions. Fig. 2 is a sectional elevation, taken at right angles to that of Fig. 1, and showing the head closed. Fig. 3 is a central, longitudinal section, corresponding to Fig. 2. Fig. 4 is a similar, partial section, corresponding to Fig. 1. Fig. 5 is a front elevation of the head. Fig. 6 is a front elevation of the body portion of the head. Fig. 7 is a longitudinal section in line  $x-x$ , Fig. 6. Figs. 8, 9 and 10 are, respectively, front and side elevations and an under side view of one of the die-blocks. Figs. 11, 12 and 13 are similar views of one of the die-block-actuating slides.

Similar characters designate like parts in all the figures.

According to my present invention the bolt-cutter head is shown as having a body portion formed with a transverse guide-way and longitudinal guide-ways, laterally-movable die-blocks engaging with said transverse guide-way, and die-block-actuating slides engaging with said longitudinal guide-ways of the body portion.

The body or main portion B of the head is shown formed of a solid piece and is internally screw-threaded at its rear end at 2, for securing the same to the spindle of the machine. Upon the front end or face of this body portion is shown a guide-way, 3, of the tongue-and-groove variety, and other similar guide-ways 4 and 5 are formed, longitudinally, in the side of said body. Slide-blocks,

such as C, engage, by means of the tongues or T-shaped portions 6, with the said guide-way 3, and are adapted to move therein toward or from one another. Die-block-actuating slides, such as D, are shown as engaging, by means of the T-shaped portions 7, with the corresponding guide-ways 4 and 5 of the body portion B, and as adapted to travel therein longitudinally with respect to the axis of the machine-spindle. Said actuating slides also engage, by means of the guides 8 and 9, with inclined guide-ways, such as 10 and 11, formed in the side edges of the die-blocks and traversing the same longitudinally, parallel with one another and with the axis of the machine-spindle. It will therefore be seen that, when the actuating slide or wedge is moved forward, the wedging action thereof will be exerted transversely upon the upper walls 10' and 11' of the die-blocks, and longitudinally thereupon. The force thus exerted will spread the die-blocks, and these will be carried away from the axis of the head by the wedging action of the inclined side faces 8' and 9' of the actuating slides.

For the purpose of simultaneously actuating both of the die-blocks, I provide a lever-mechanism in connection with the slides or wedges, which will now be described. The body portion B is shown as having longitudinal recesses 12, formed as continuations of the guide-ways 4 and 5, and located centrally thereof, so that their axes are in a line passing through the axis of the machine-spindle and are also parallel with said axis. Within said recesses are shown pivoted at 13, by bolts or any other suitable means, two-armed or angle-levers, such as 14, the arms 14' and 14'' of which engage, by their preferably curved, outer edges, the end walls of a central, longitudinal slot 15 in the actuating slide or wedge D. The recesses 12 in the body portion register with the corresponding slots in the actuating slides, and are formed with front and rear stop-faces or abutments 12' and 12'', against which the arms of the angle-lever are engaged to limit the movements thereof. Upon the periphery of the hub or body portion B of the head, and also upon the curved portions 16 of the actuating slides or wedges, which portions or faces are so curved as to coincide with the circle bounding the said

hub,—is mounted a lever-actuating collar, E, loosely secured thereon and adapted for reciprocation thereupon with respect to the body portion B. This collar is provided with  
 5 an annular flange 17 upon its forward face, for the purpose of engaging against the inner wall 18 of the arm 14' of the angle-lever and rocking said lever upon its axis 13, where-  
 10 upon the actuating slide or wedge is carried forward, by engagement of said arm 14' against the forward end or wall of its slot 15, to the position shown in Fig. 4. At the end  
 15 of this movement the arm 14' is securely locked in position by engagement of its curved, outer face with the stop-face or abutment 12' of the body portion, and by engagement of its  
 20 upper face 18' against the inner side or stop-face 20 of the wedge-collar E. This movement of the lever has carried the corresponding die-block C forward, and, by the wedging  
 25 action of the actuating slide, exerted in transverse direction against the outer wall of the inclined guide-way in the die-block, said die-block is carried away from the axial line of  
 30 the head, and the die correspondingly opened. It will be understood, of course, that both of the angle-levers are actuated simultaneously by means of the wedge-collar, and that the  
 35 action upon each side of the head is identical with that upon the opposite side, whether the die is being opened or closed.

When the die is to be closed, the collar is retracted until the face 17' of the stop 17  
 35 clears the forward arm 14' of the angle-lever, and the wedge-collar thereby unlocks the wedges or slides, and the die can now be closed. A second actuating-face, 21', is formed by the  
 40 annular, flanged or upset portion 21 of the collar; and, shortly after the release of the arm 14' by the stop 17, the arm 14'' of the lever is engaged by said actuating-face 21', and the lever drawn to the position shown in Fig.  
 45 3, where it is locked by abutment against the inner, bearing face of the collar. It will be observed that the distance between the stop-faces 17' and 21' is somewhat less than the  
 50 distance between the inner walls of the two lever-arms, in order to allow for play of the lever during its rocking movements. The lever-arm 14' having been unlocked, by the  
 55 movement of the collar to the right, the arm 14'' is engaged, and, by engagement with the rear wall of the slot 15, in the actuating wedge or slide, carries said slide to the rear. By the  
 60 pull of the inner walls 22 and 23 of the guides 8 and 9 of the actuating slide upon the corresponding walls 24 of the die-blocks, said lever-arm draws said wedges or slides positively  
 65 to the rear, thereby causing the said blocks to ride down the inclined faces 8' and 9' of the actuating slides, and down the way 3, until the rounded faces 25 of said die-blocks, which were projected beyond the periphery  
 of the head by the opening movement, again coincide with the circle describing the periphery of the head. It will be noticed that the rear walls of the die-blocks project be-

yond the circumference of the body portion while the die is open, to form stops for limiting the forward movement of the wedge collar. In Fig. 4, a second stop for checking the  
 70 forward movement of the collar is shown, which comprises an annular flange, 26, formed integral with the said collar and having an inner stop-face 26'. Hence, when the collar  
 75 is in its forward position and the die is open, the angle-levers are completely covered by the collar.

In both the forward and the rearward movements of the collar and actuating slides, a  
 80 portion of the strain is taken up by the broad bearing-faces or surfaces of the guide-way 3 and the guides 6, so that the die-blocks yield freely when a force is exerted in either direction; the said die-blocks being guided within  
 85 the way 3 and against the forward faces 27 of the body portion, and actuated either by the bearing-faces 8' and 9' engaging corresponding, outer faces, as 10' and 11', of inclined  
 90 ways, such as 10 and 11, or else by the pull of the inner walls or bearing-surfaces 22 and 23 of the guides 8 and 9, upon the inner walls or faces 24 of the inclined ways of the die-blocks.

I have shown each of the die-blocks as provided with two dies, 28, each of which is held  
 95 against radial movement by a check-screw 29, and against lateral or wobbling movement by means of a clamping-screw, 30, working in an oblique slot 31 in the face of the body portion  
 100 and engaging the recessed portion 32 of the die, for locking it in position. The particular method of, or means for, holding the dies in place is, however, immaterial, as the same result might be accomplished in many different  
 105 ways.

In order to facilitate the discharge of chips from the dies, I have shown the die-blocks as provided with bores or openings 32', just beyond the rear edges of the dies; but these  
 110 openings may be omitted.

By means of my present improvements I obtain a head for bolt-cutters and like machines in which the several parts are maintained at all times in practically the same relation to one another, so far as the solidity of  
 115 the head is concerned, and in which all of the sliding parts are positively interconnected in such a manner as to maintain a substantially solid structure in all positions of the movable  
 120 parts. The force exerted upon the die-blocks is so distributed at both the front and the rear ends thereof, that there is but a minimum loss by friction between opposing faces of the guides and guide-ways, and the broad  
 125 bearing-faces of the way 3. The guide 6 and the face of the body portion B hold the die-blocks firmly in position, while preventing binding of the meeting faces of the inclined guides and ways against one another. Both  
 130 of the die-blocks move simultaneously, and are adapted to be operated from either end simultaneously, so that all of the movements upon one side of the central axis will be in

synchronism with those upon the opposite side, and an accurate adjustment of the dies thus assured by a single movement of the wedge-collar. When so adjusted, both of the levers for securing the die-blocks are simultaneously locked in their set positions, so that the shaking loose of said die-blocks by the jarring of the head and spindle to which they are secured is prevented.

Having thus described my invention, I claim—

1. In a head for bolt-cutters, the combination with the body portion of the head having a transverse guide-way, of opposing sliding die-blocks engaging said guide-way, and die-block-actuating means cooperating with said body portion and with the die-blocks and in position and adapted for engaging the opposing faces of said die-blocks on diametrically-opposite sides of the head and for closing the space between said faces in all positions of the head and also serving to simultaneously and positively actuate both die-blocks in either direction, substantially as described.

2. In a head for bolt-cutters, the combination with the body-portion of the head having a transverse guide-way therein, of opposing sliding die-blocks engaging said guide-way, die-block-actuating slides cooperating with said body portion and with the die-blocks and in position and adapted for engaging the opposing faces of said die-blocks on diametrically-opposite sides of the head and for closing the space between said faces in all positions of the head, and means for simultaneously actuating said slides in either direction, substantially as described.

3. In a head for bolt-cutters, the combination with the body portion of the head having a transverse guide-way therein, of opposing sliding die-blocks engaging said guide-way and having inclined lateral ways, and actuating slides cooperating with said body portion and having inclined guides engaging the inclined ways of the die-blocks and serving to actuate said die-blocks in either direction in said transverse way said slides being positioned and adapted to engage the opposing faces of the die-blocks on diametrically-opposite sides of the head and close the space between said faces in all positions of the head, substantially as described.

4. In a head for bolt-cutters, the combination with the body portion of the head having a transverse guide-way therein, of opposing sliding die-blocks engaging said guide-way and having inclined lateral ways, die-block-actuating slides cooperating with said body portion and having inclined guides engaging the inclined ways of the die-blocks and in position and adapted for engaging the opposing faces of said die-blocks on diametrically-opposite sides of the head and closing the space between said blocks in all positions of the head, and means for simultaneously actuating said slides in either direction in said transverse way, substantially as described.

5. In a head for bolt-cutters, the combination with the body portion of the head having a transverse guide-way and longitudinal guide-ways therein, of opposing sliding die-blocks engaging said transverse guide-way and having inclined lateral ways, slotted actuating slides engaging said longitudinal ways in the body portion and having inclined guides engaging the inclined ways of the die-blocks said slides being positioned and adapted to form with said body portion and die-blocks a substantially rigid and unitary structure in all positions of the head, angle-levers extending through the slotted slides and pivoted within the body portion of the head, and a collar surrounding the head and serving to engage the arms of the levers and thereby simultaneously actuate the slides, substantially as described.

6. In a head for bolt-cutters, the combination with the body portion of the head having a transverse guide-way therein, of opposing sliding die-blocks engaging said guide-way, die-block-actuating slides cooperating with said body portion and with said die-blocks and in position and adapted for forming therewith a substantially rigid and unitary structure in all positions of the head, angle-levers pivoted within said body portion for actuating the slides, and a lever-actuating collar surrounding the head and serving to lock said levers at the end of each movement thereof, substantially as described.

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Witnesses:

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