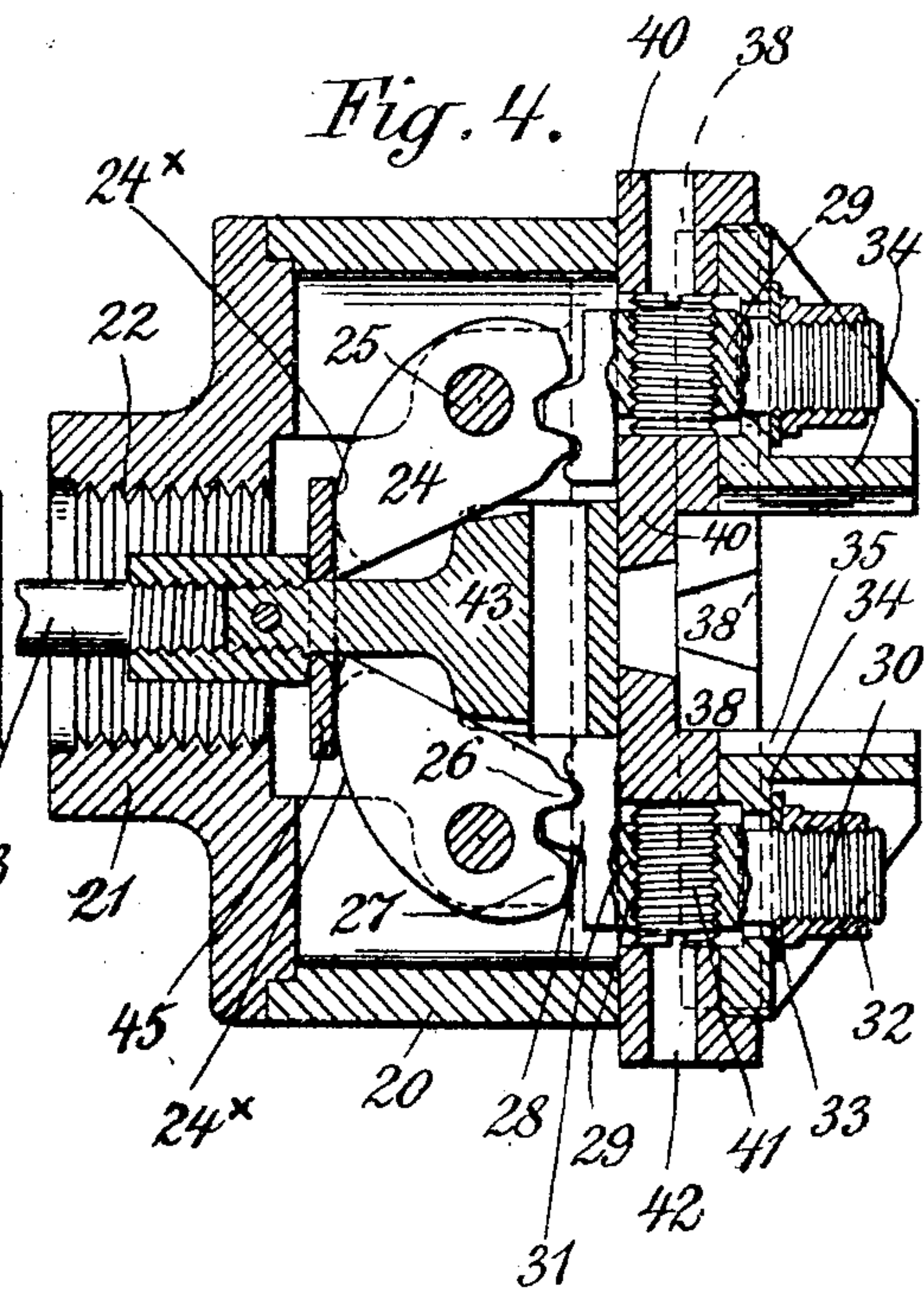
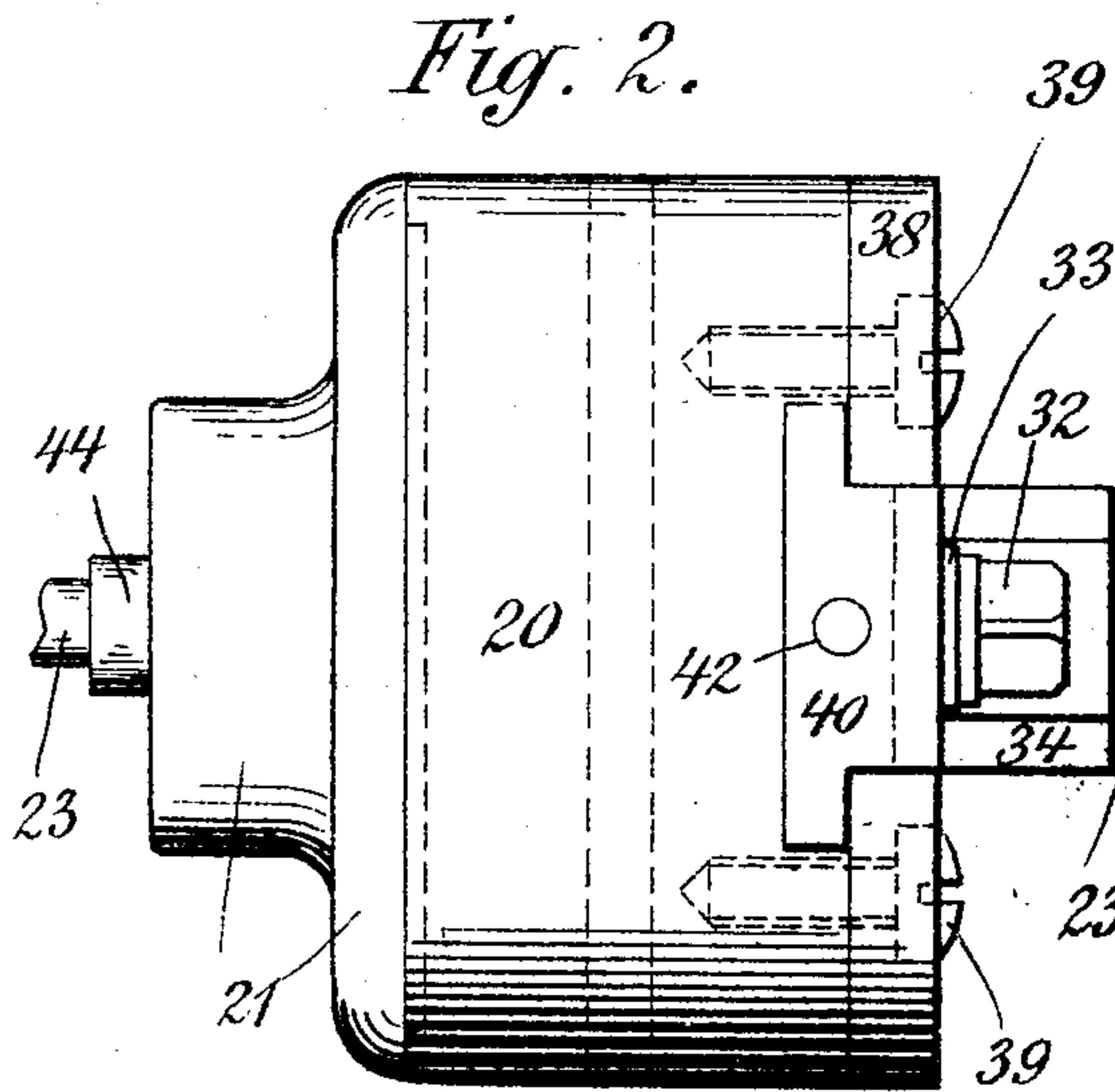
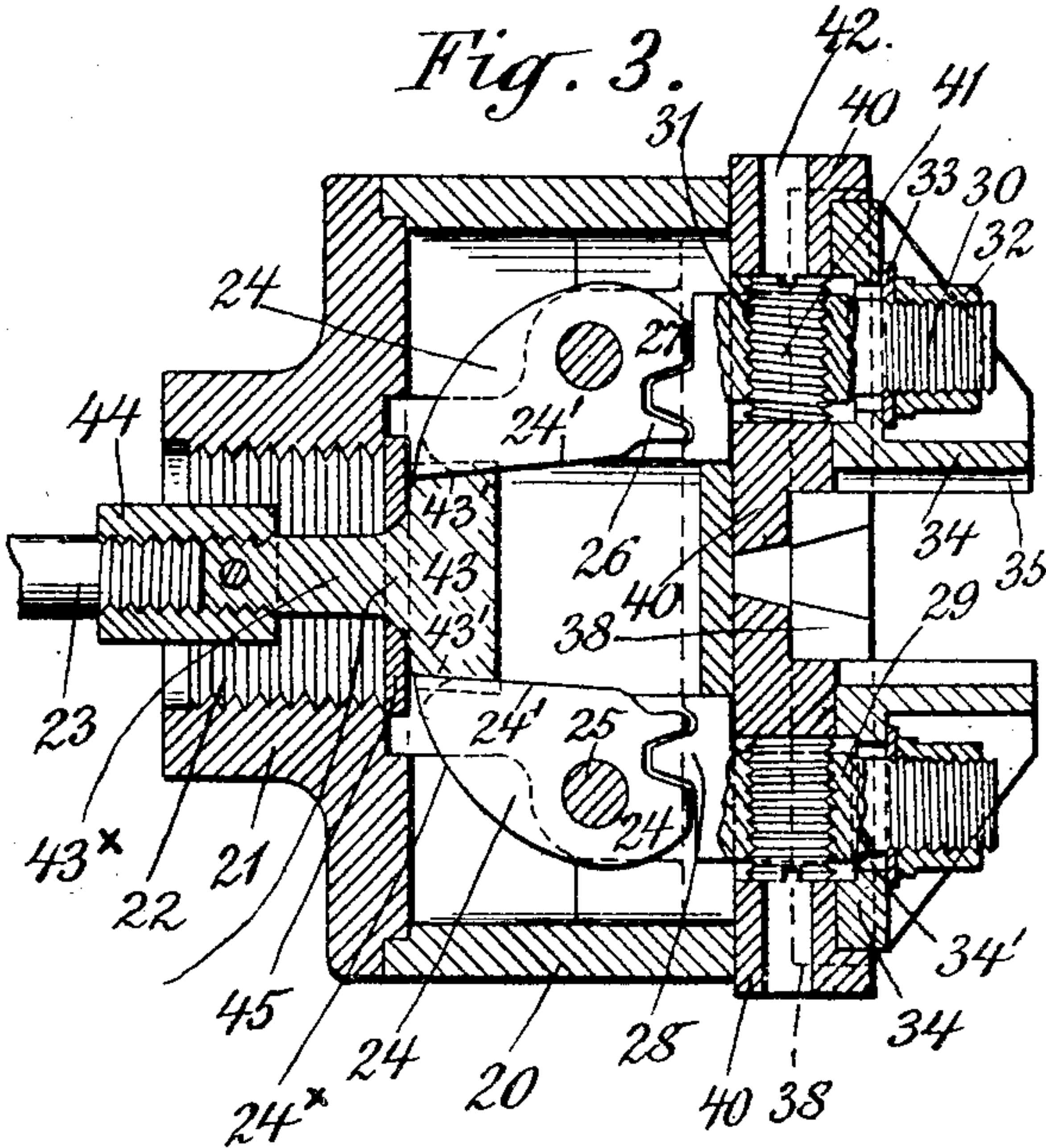
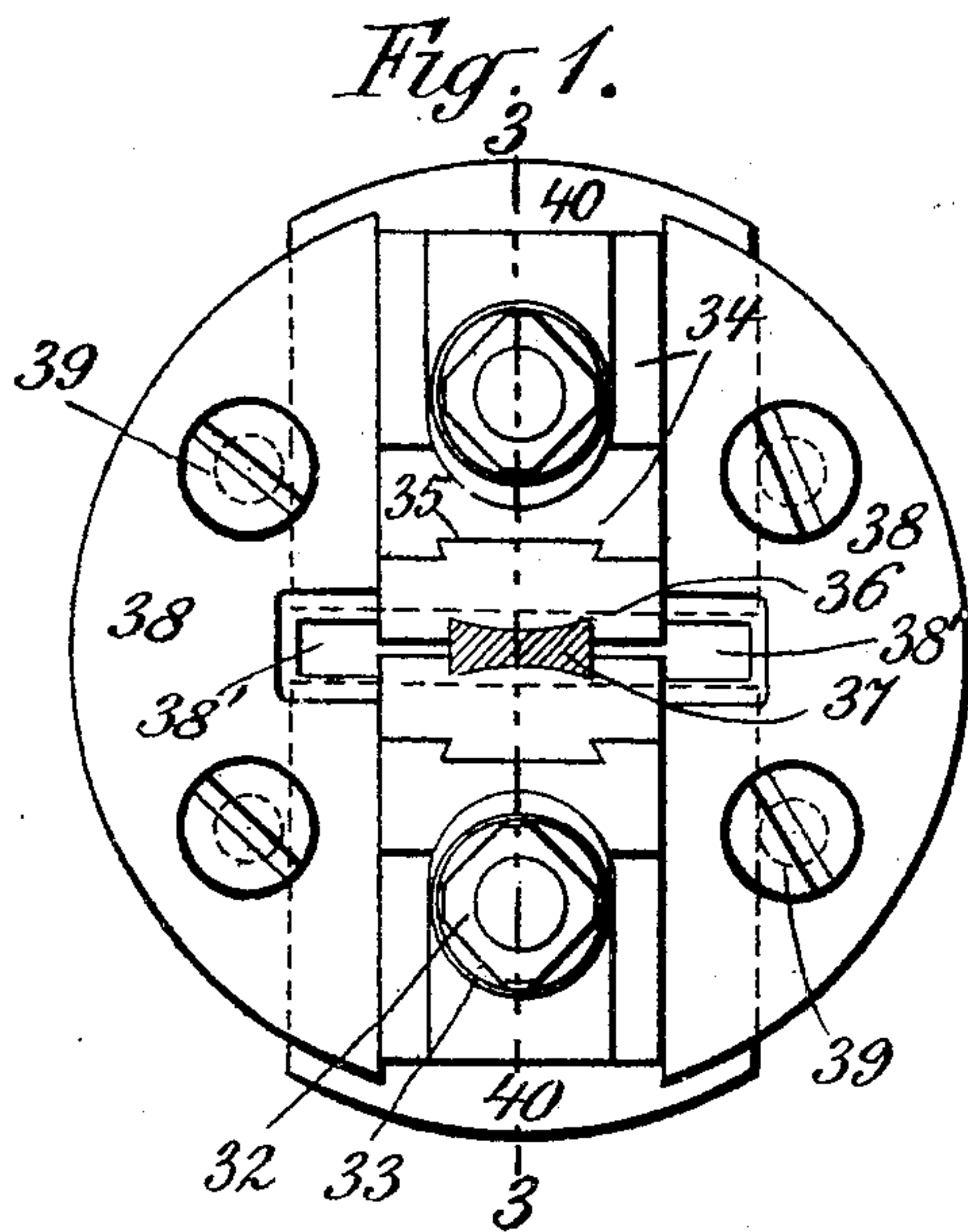


P. F. KRUG.

CHUCK.

APPLICATION FILED MAY 7, 1902.

3 SHEETS—SHEET 1.



Witnesses
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CHUCK.

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3 SHEETS—SHEET 2.

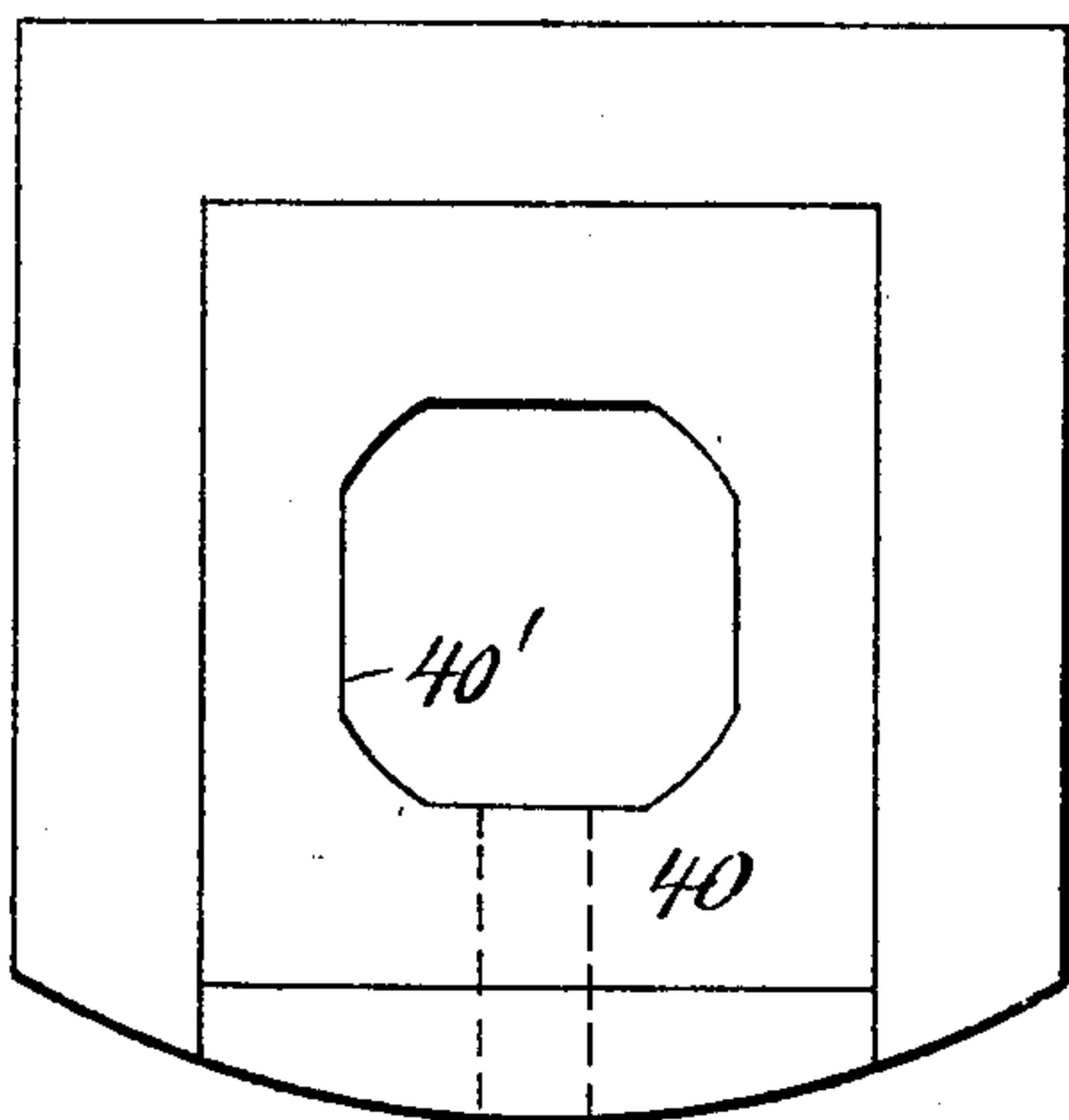


Fig. 5.

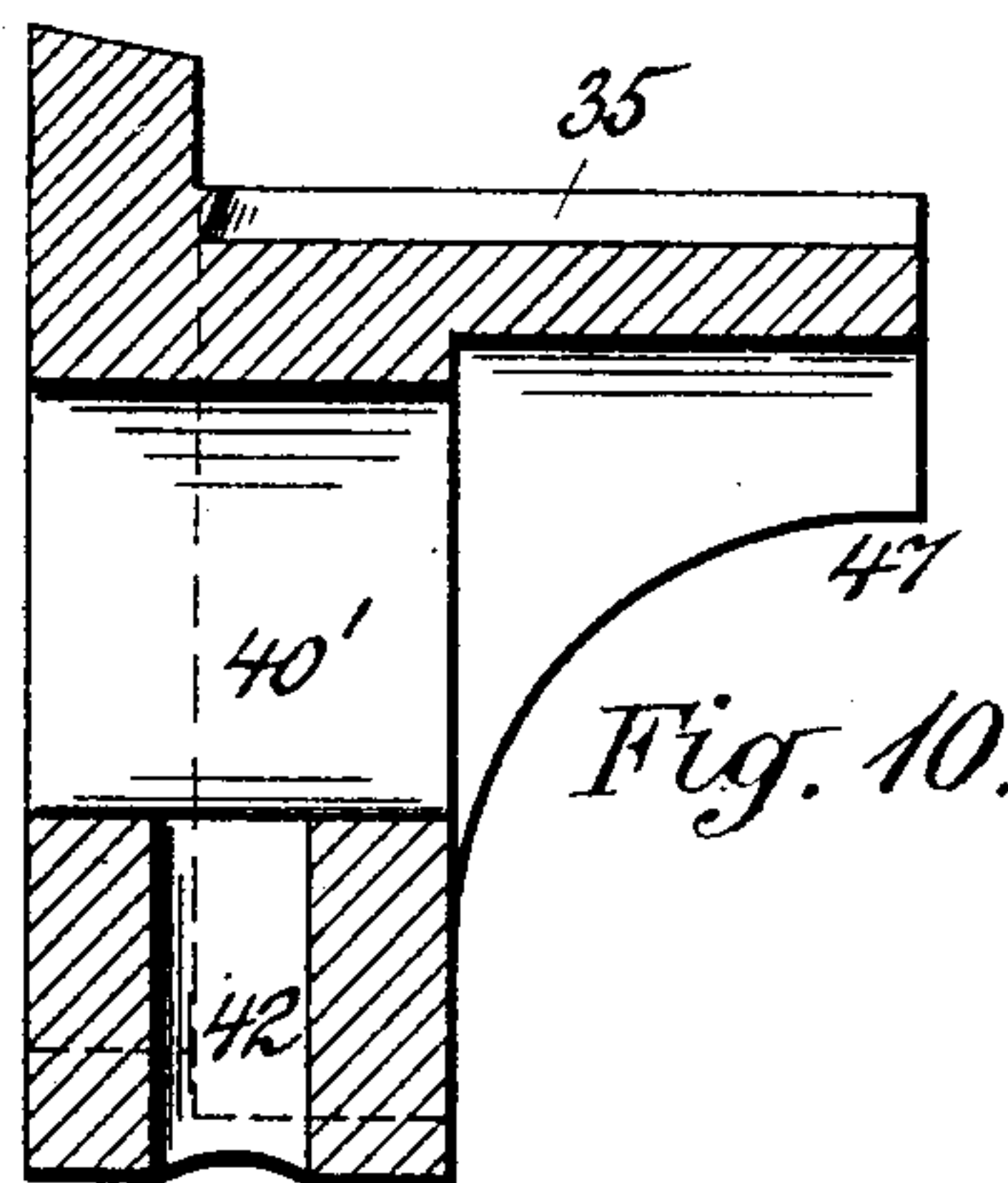


Fig. 10.

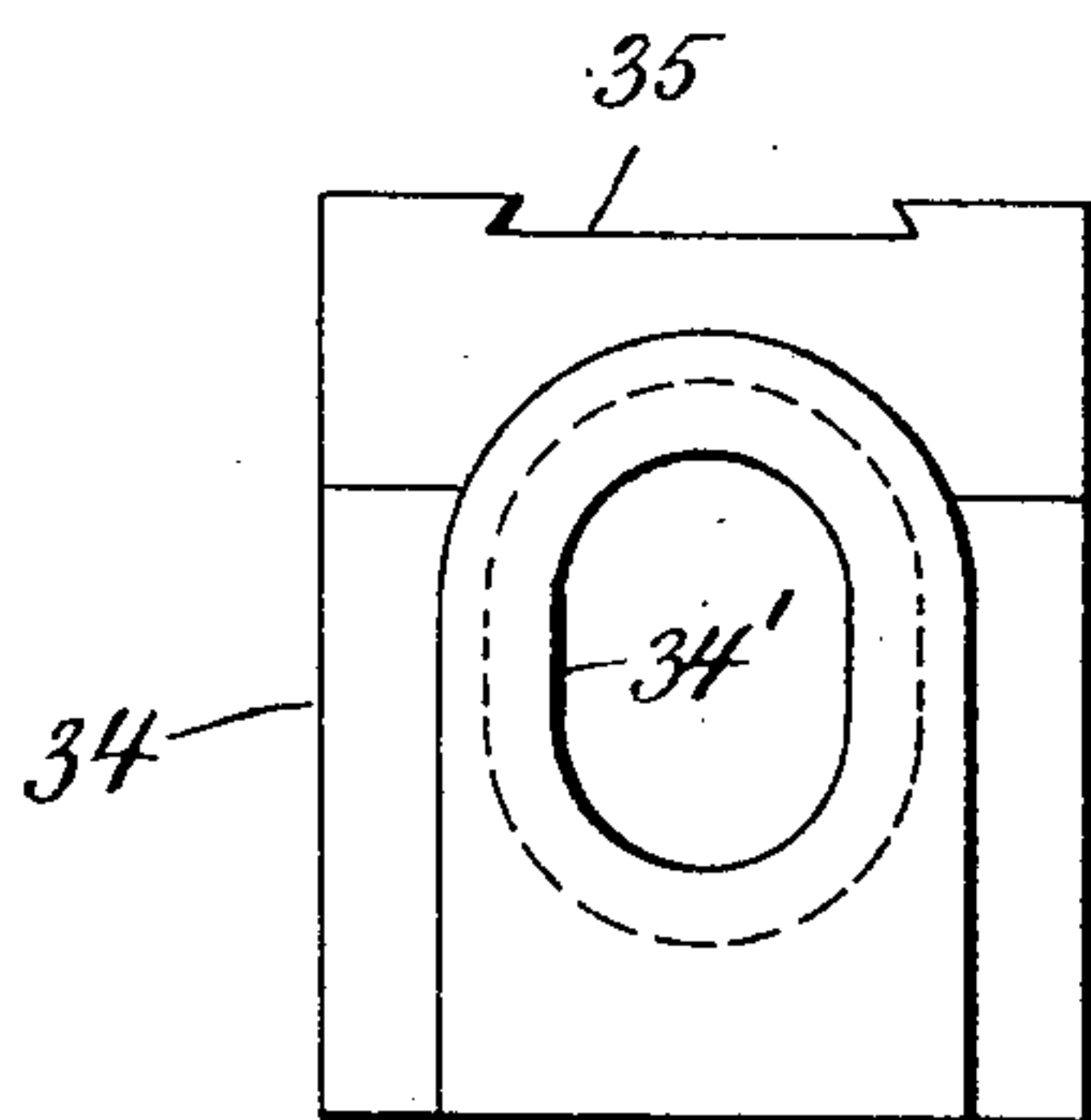


Fig. 6.

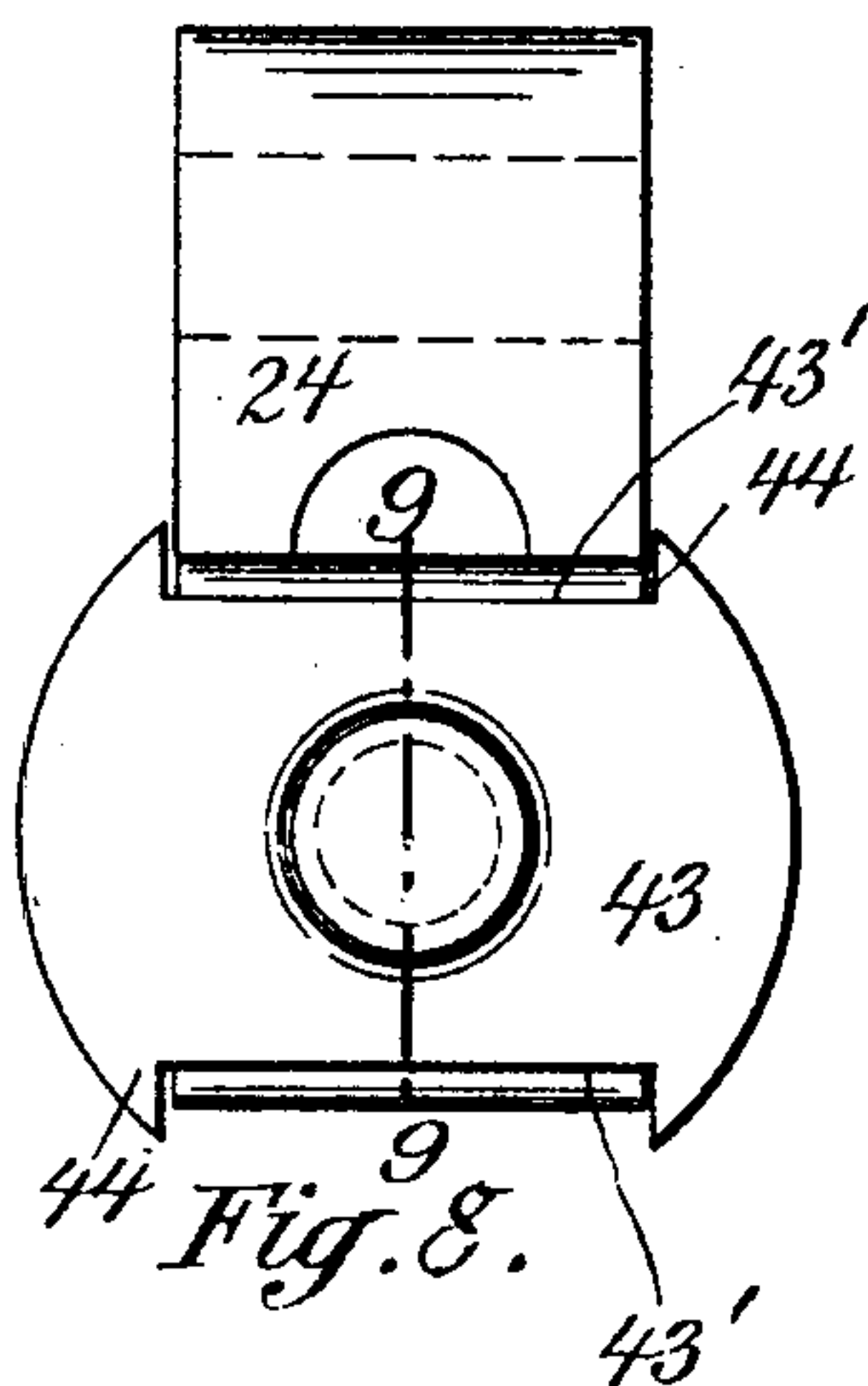


Fig. 8.

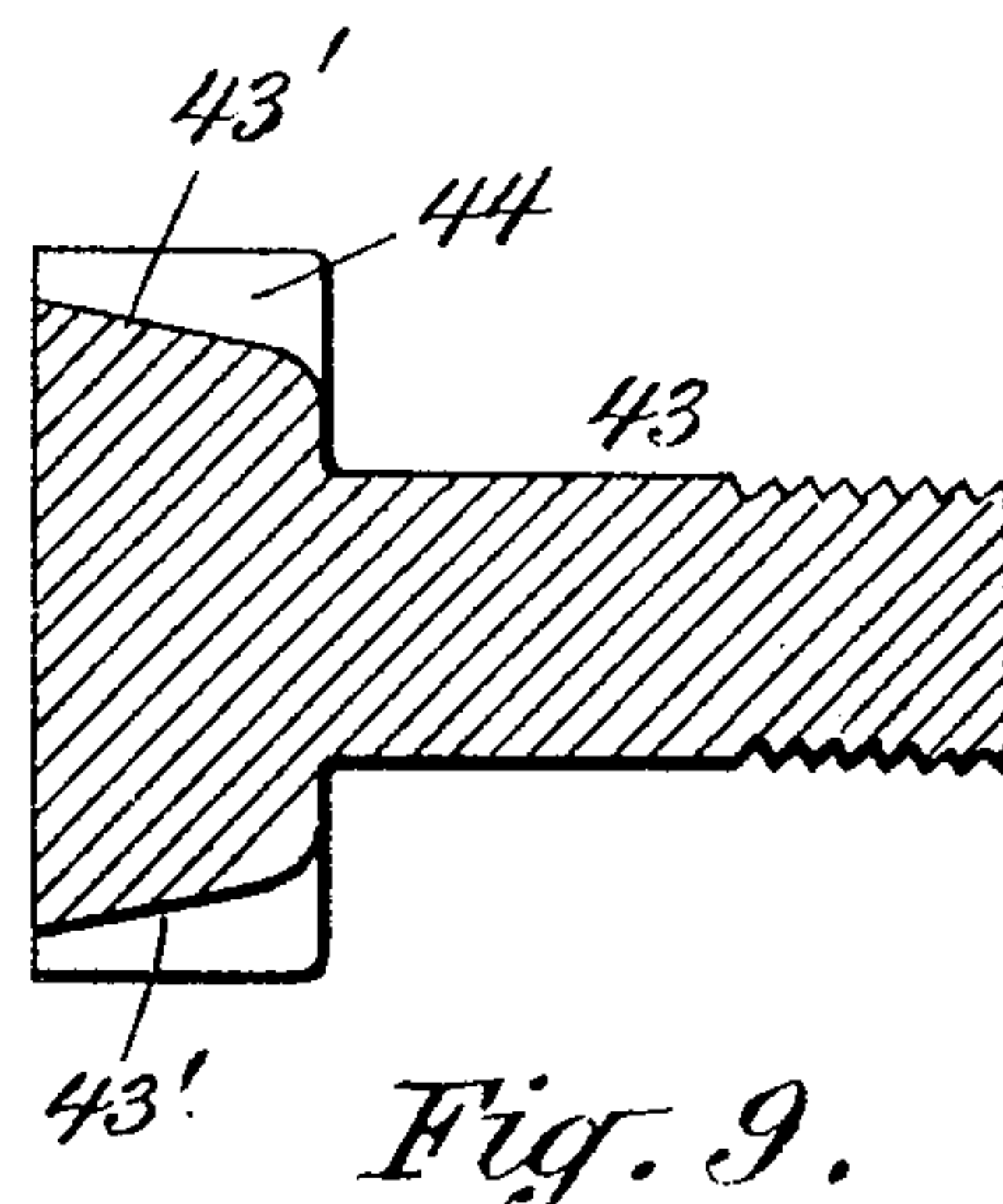


Fig. 9.

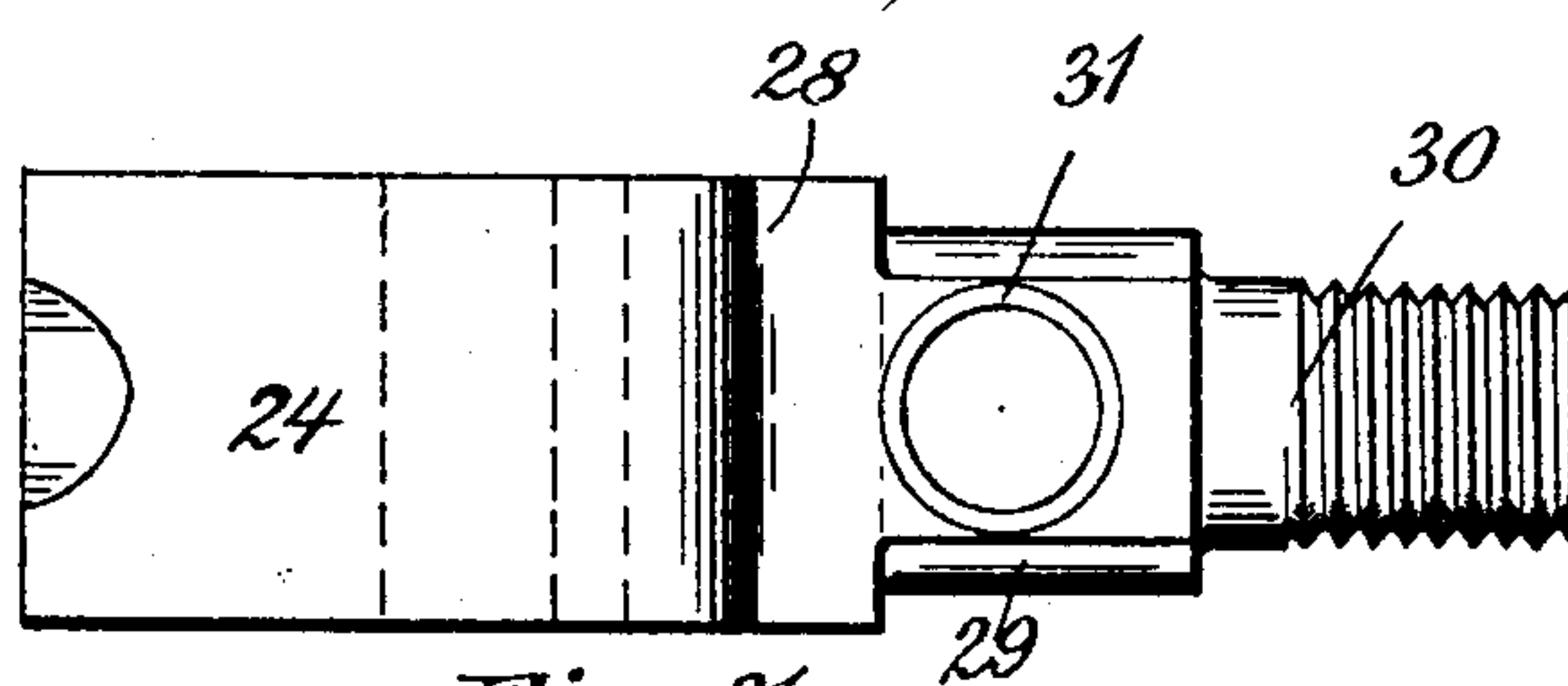


Fig. 7.

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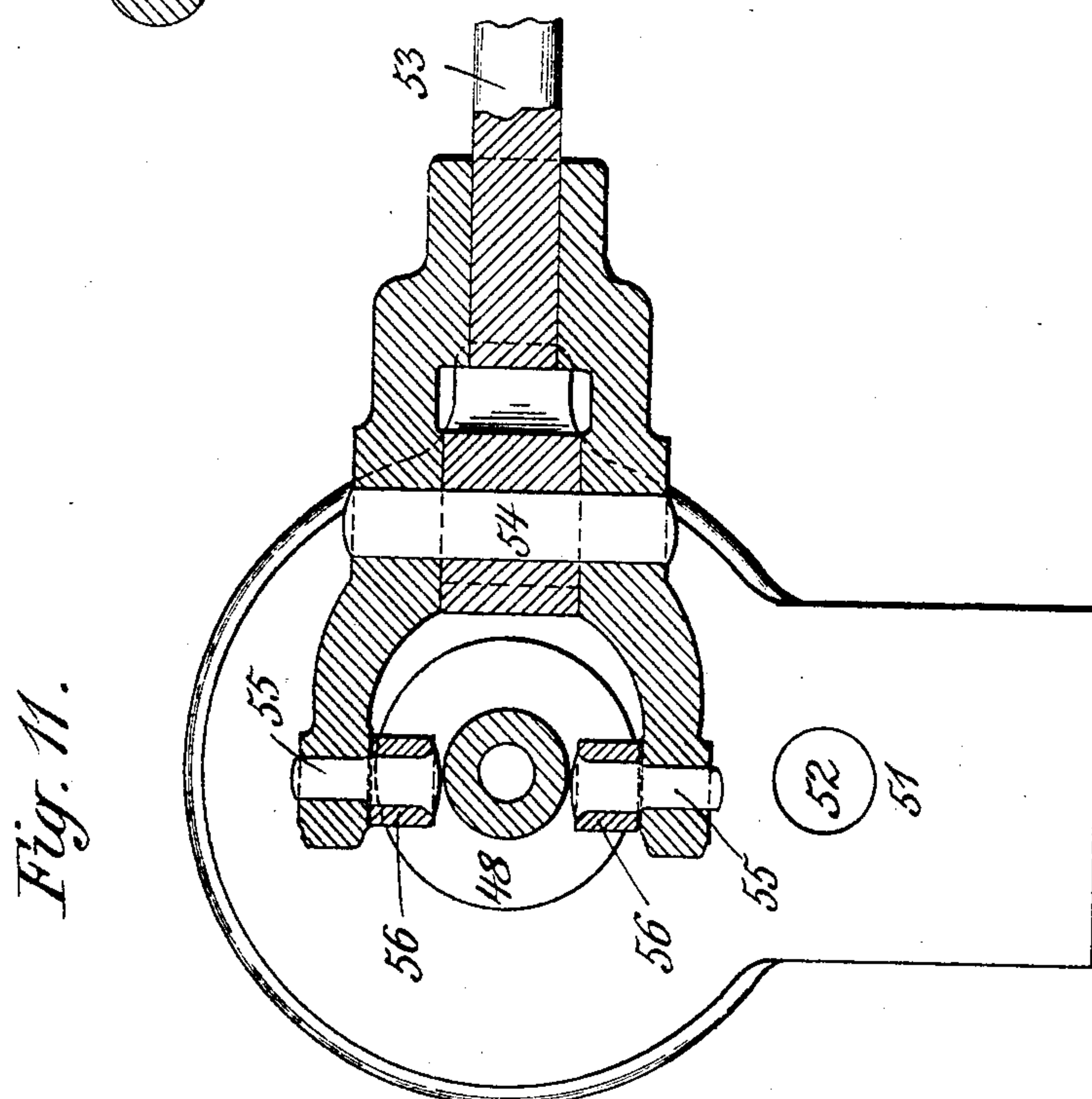
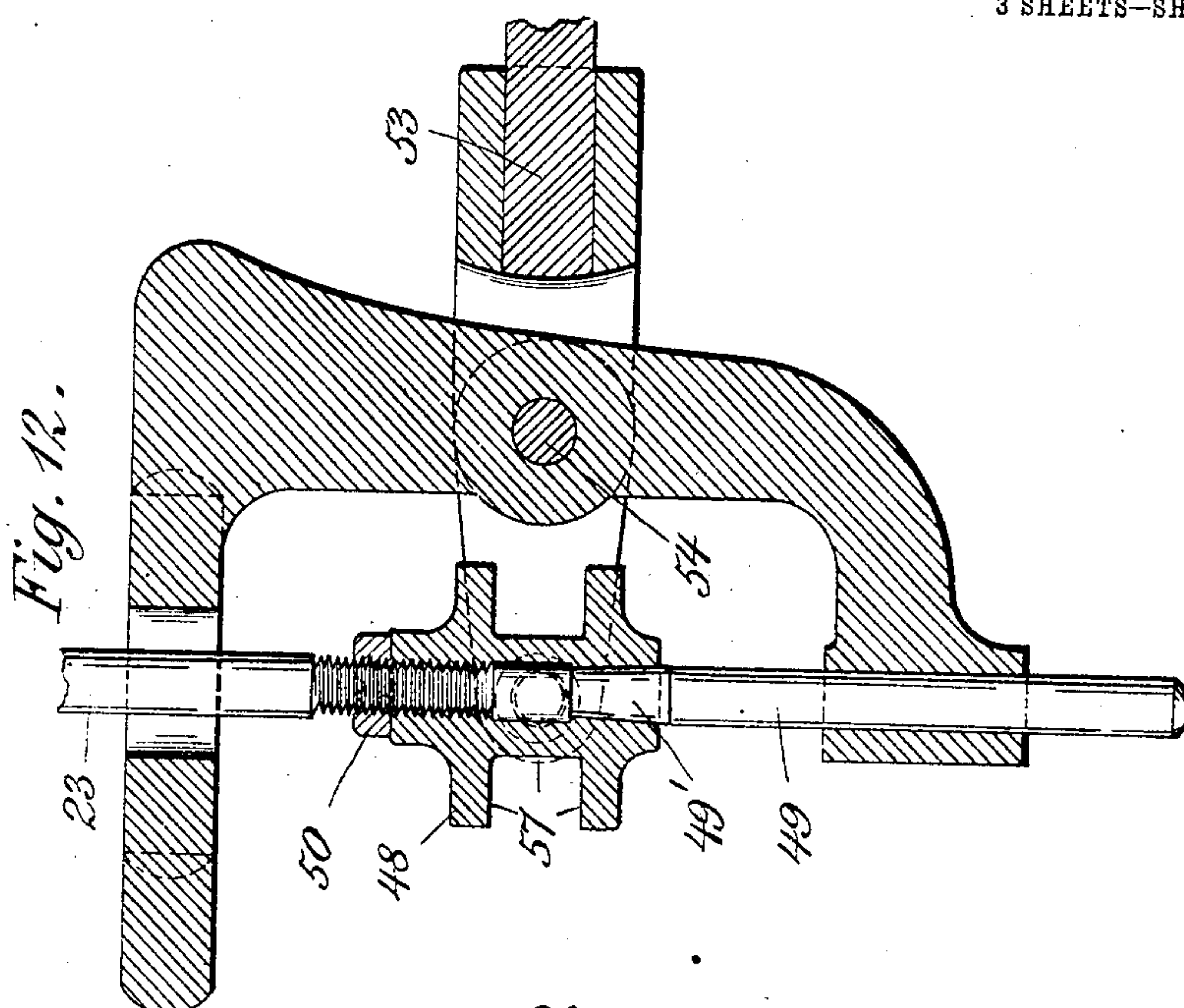
No. 803,604.

PATENTED NOV. 7, 1905.

P. F. KRUG.
CHUCK.

APPLICATION FILED MAY 7, 1902.

3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

PHILIP F. KRUG, OF NEW YORK, N. Y.

CHUCK.

No. 803,604.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed May 7, 1902. Serial No. 106,276.

To all whom it may concern:

Be it known that I, PHILIP F. KRUG, a citizen of the United States, residing at New York, State of New York, have invented certain new and useful Improvements in Chucks, of which the following is a specification.

My invention relates more particularly to chucks which are to be used in combination with turning-lathes, and especially to chucks employing two clamping-jaws and used for holding articles of irregular cross-sections.

The purposes of my invention are to so construct a chuck as to permit of opening and closing the same readily and without the use of wrenches and tools and while the lathe-spindle is revolving and to produce prompt, strong, and uniform gripping action on the part of the jaws of the chuck. These and other useful purposes I accomplish by the means hereinafter specified, and set forth more particularly in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 represents a front view of a chuck constructed according to my invention, and Fig. 2 a top view of the same, while Figs. 3 and 4 represent vertical longitudinal sections of the chuck along line 3-3 in Fig. 1, Fig. 3 showing the same closed and Fig. 4 showing it partly open. Figs. 5, 6, 7, 8, 9, and 10 are drawn to an enlarged scale and illustrate details of the working parts of the chuck, while Figs. 11 and 12 are cross-sections of the lever mechanism for actuating the chuck, Fig. 11 being placed in a vertical and Fig. 12 in a horizontal plane.

Corresponding figures of reference throughout the different views refer to corresponding parts.

In the drawings, 20 is a cylindrical casing, attached to a flange 21 by suitable screws, (not shown,) said parts 20 and 21 together forming the main body of the chuck, the screw-thread 22 on flange 21 particularly serving as the means for attaching the chuck to a suitable lathe.

23 is a reciprocating rod for opening and closing the jaws of the chuck. The same revolves with the chuck.

24 represents two levers pivoted at 25 to the body of the chuck and having teeth 26 and 27 engaging with cams 28, the lower one of said levers, together with the cam 28 engaging therewith, being shown in ground plan in Fig. 7. Said levers and their connecting parts are alike, and they are mounted symmetrically with reference to the axis of the

chuck, so that the following description of the arrangement and of the connections of one of said levers will also cover those of the other lever.

29 is a horizontal cylindrical shank flattened on top and bottom and made integral with cam 28, and 30 a screw-threaded horizontal stud which forms an extension of shank 29. 31 is a screw-threaded perforation extending through said shank in a direction radial with reference to the main axis of the chuck.

32 is a screw-nut engaging with the screw-thread on stud 30, and 33 a washer interposed between said nut and the face of a clamping part 34, shank 29 and stud 30 passing through a perforation 34' in part 34. Said perforation is elongated in the direction toward the axis of the chuck, so as to permit of holding said shank in fixed contact with said clamping part at varying distances from such axis.

35 represents a dovetail on the clamping part, into which is to be inserted a separate mouthpiece 36, having that part of its surface nearest to the axis of the chuck so shaped as to receive and clamp, with the assistance of the opposite mouthpiece, any piece of metal, such as 37, which is to be worked in the chuck.

The dotted lines shown at the left of the levers 24 in Figs. 3 and 4 of the drawings refer to interior portions of the chuck-casing, the construction and configuration of which is not material as far as the present invention is concerned.

38 is a sectional face-plate of the chuck, comprising two segments of a disk fixedly attached to the main body of the chuck by screws 39. Said sections of the face-plate serve to guide between them clamping parts 34 and also sliding parts 40 toward and away from the axis of the chuck, and through a perforation 40' in each of said sliding parts passes one of the shanks 29, said perforation being made larger than said shank in all directions, so as to permit of easy insertion of said shank and of adjustment of the same toward and away from the axis of the chuck, together with the corresponding clamping part 34, the latter being fixedly held to said sliding part by means of nut 32 and washer 33, which latter compels said parts 34 and 40 to move together with cam 28.

Fig. 5 represents an end view of a sliding part 40, and Fig. 6 such a view of a clamping part 34. Sliding parts 40, together with clamping parts 34, form the jaws of the chuck.

41 is a screw inserted in perforation 31. By

turning said screw the position of cam 28 with reference to sliding part 40 and clamping part 34 can be adjusted. 42 is a perforation in the corresponding sliding part 40 for inserting
5 into the same a screw-driver for actuating such a screw.

Teeth 26 and 27 on levers 24 are moved inward and outward, and the jaws are thereby forced toward the axis of the chuck into their
10 clamping positions or away from said axis and out of such clamping positions by the following means: 43 is a locking-bolt attached to reciprocating rod 23 by means of a coupling 44. The sides of levers 24 facing each other, which
15 are indicated by 24', are straight and engage either with the flattened surfaces 43' 43' of block 43, as shown in Fig. 3, or with the rear edges of such surfaces. Such locking engagement, however, can only take place when the
20 points where block and levers contact are in the rear of pivots 25, and the most favorable positions in that respect are shown in Fig. 3, as there the greatest leverage for clamping the jaws is obtained. Fig. 8 shows a rear
25 view of said locking-bolt and of one of the levers 24 in engagement therewith, while Fig. 9 is a longitudinal section of said bolt along line 9 9 in Fig. 8. 44 44 are cheeks on said bolt along both sides of the contact-surfaces
30 43', which help to maintain levers and locking-bolt in their proper relative positions. 45 is a washer loosely mounted upon the rear reduced portion 43^x of locking-bolt 43, so as to be capable of sliding along the same while
35 said locking-bolt is reciprocating. The outer surfaces 24^x of the levers 24 are made curving in the form of part of a circle. When rod 23 is being pushed toward the face of the chuck for the purpose of opening the latter,
40 the rear ends of the levers will be freed, so as to become capable of swinging inward, and washer 45 will be moved along the rear shank portion 43^x of locking-bolt 43, owing to its contact with the curving portions of
45 said rear ends, until the forward end of coupling 44 meets said washer and by forcing it forward compels the swinging inward of said rear ends and therefore the swinging outward of the forward ends of said levers 24, which
50 engage with cams 28, thus enforcing opening of the chuck. It will thus be seen that washer 45 is in contact with the rear curving portions of levers 24 not only prior to the opening of the chuck, but remains in contact therewith
55 while the said levers are being actuated for the purpose of opening the chuck. By so constantly insuring contact between said washer and the curving portions of said levers I secure easy movement of the chuck without sudden injurious impacts of said parts, and thereby guard against uneven wearing of the washer and against producing indentations in the levers and the washer when the chuck is being opened. Said washer through its tangential
60 contact with the rear curving surfaces of said

cams during the movements of the latter and while the same occupy their locking positions serves to produce uniform movements and actions of said cams. It will thus be seen that the firm grip of the jaws of the chuck will
70 first be relaxed and that afterward positive force applied to levers 24, through the instrumentality of washer 45, will enforce outward movement of the same until the chuck is open. The rear curving parts of the levers are made
75 circular in outline, so as to have washer 24 occupy substantially tangential positions with reference thereto and to thus secure uniform action of the washer upon said curving portions while the levers are occupying varying
80 positions.

The inner surfaces of sliding parts 40 nearest to the axis of the chuck are made tapering forward and outward, so as to leave a space
85 between said sliding parts with opposite sides flaring outward, and the central portions of the sections of the face-plate 38 are provided with slots (indicated by 38') for the purpose of readily discharging from the space between
90 said sliding parts and from the central opening of the face-plate formed by said slots any chips that may enter there while the chuck is being used in shaping the article inserted between its mouthpieces. It is a great difficulty
95 heretofore generally encountered in operating chucks that chips will lodge between its sliding parts and in the opening of the face-plate and there have a tendency to cut into adjoining parts and to destroy the same. This difficulty
100 I overcome by providing the tapering surfaces on sliding parts 40 and on the face-plate referred to above, whereby such chips are expelled automatically upon the closing of the jaws and during the revolving of the chuck. Owing to the employment of said tapering
105 surfaces chips will be expelled from the chuck whether the same be running or standing still.

I prefer to construct clamping parts 34 and sliding parts 40 separate and detachably connected with each other, so as to be able to
110 readily take the clamping parts out of the chuck without otherwise disorganizing the chuck whenever different mouthpieces are to be fitted into the same for the purpose of gripping special articles of different shape. However, I do not wish to confine myself to this construction, as it will readily be seen that they might instead be constructed in one piece. Such a construction is shown in central section
115 in Fig. 10, wherein 47 represents such a combined clamping part and sliding part.

The means for producing reciprocating movement of rod 23 are illustrated in Figs. 11 and 12, wherein 48 indicates a coupling
120 into one end of which rod 23 is screwed. 49 is a guide-rod inserted into the opposite end of said coupling, said guide-rod being made slightly conical at 49', where it enters said coupling, so as to be readily and yet firmly
125 130

inserted therein. 50 is a jam-nut on rod 23 where it enters said coupling. Rod 23 and guide-rod 49 might be made of one piece. 51 is a flange which may be attached to the rear part of the lathe by means of a bolt 52. 53 is the operating-lever, fulcrumed at 54. 55 represents pins driven into the arms of the lever, on which rollers 56 revolve. As the lever is being actuated said rollers engage with one or the other side of groove 57, and thereby push the coupling, and with it rod 23, either in one or in the opposite direction. By coupling together rod 23 and guide-rod 49 by means of part 48 I am enabled to readily substitute for said rod 23 another one of different length, as may be required when the chuck is attached to a lathe of different size and construction.

Several features of the apparatus might be varied without departing from the spirit of my invention, and I therefore do not wish to confine myself to the details and the detail combinations set forth above.

I claim—

1. In a chuck, the combination with its casing of perforated sliding jaws guided upon the same, separate clamping parts, bolts passing through the clamping parts and through the perforations in the jaws, cam-pieces integral with said bolts, and mechanism for actuating said cams.

2. In a chuck, the combination with its casing, of perforated sliding jaws guided upon the same, separate clamping parts, bolts passing through the clamping parts and through the perforations in the jaws, cam-pieces integral with said bolts placed on one side of said sliding jaws and screw-thread arrangement on the opposite side of said jaws for holding said cam-pieces in contact with said jaws, and means for actuating said cam-pieces.

3. In a chuck, the combination with its casing, of perforated sliding jaws guided upon the same and comprising sliding parts and separate clamping parts, screw-bolts passing through said jaws and through the clamping parts for confining the clamping parts in contact with the sliding parts, cam-pieces, said bolts being connected with said cam-pieces, and means for actuating said jaws.

4. In a chuck, the combination with its casing, of perforated sliding jaws guided upon the same, separate clamping parts, cam-pieces integral with screw-bolts which pass through the clamping parts and the perforations in said jaws, screws inserted in said sliding jaws and engaging with screw-threaded perforations in aforesaid bolts for adjusting the positions of said cam-pieces with reference to the axis of the chuck, and means for actuating said cam-pieces.

5. In a chuck, the combination with its casing, of sliding jaws guided upon the same toward and away from the axis of the chuck, surfaces on said jaws facing said axis being made slanting outward toward the face of the chuck.

6. In a chuck, the combination with its casing comprising a suitable divided face-plate, of sliding jaws guided upon said casing in the rear of said face-plate, said face-plate being provided with outward-flaring slots, and the surfaces on the jaws facing the axis of the chuck being made slanting outward.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 3d day of May, 1902.

PHILIP F. KRUG.

Witnesses:

C. L. HORACK,
ARTHUR C. BLATZ.