

No. 771,218.

PATENTED SEPT. 27, 1904.

G. H. GILMAN.

COMBINED CHUCK AND ROTATING DEVICE FOR ROCK DRILLS.

APPLICATION FILED OCT. 29, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

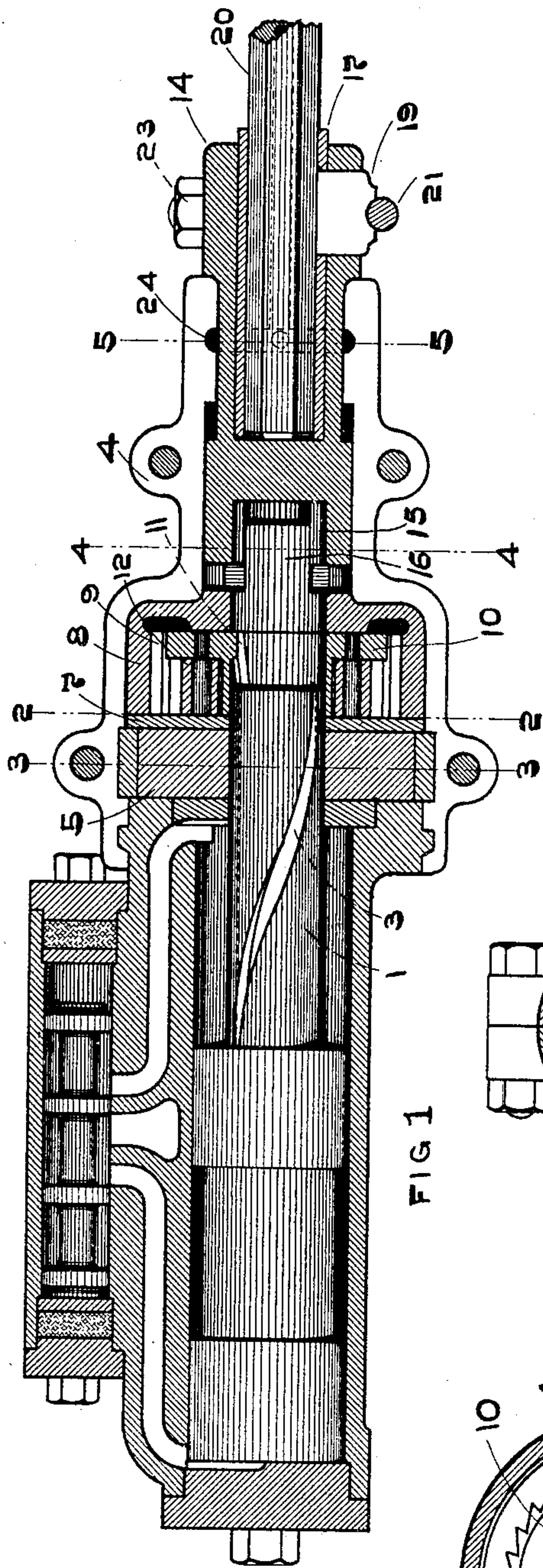


FIG. 1

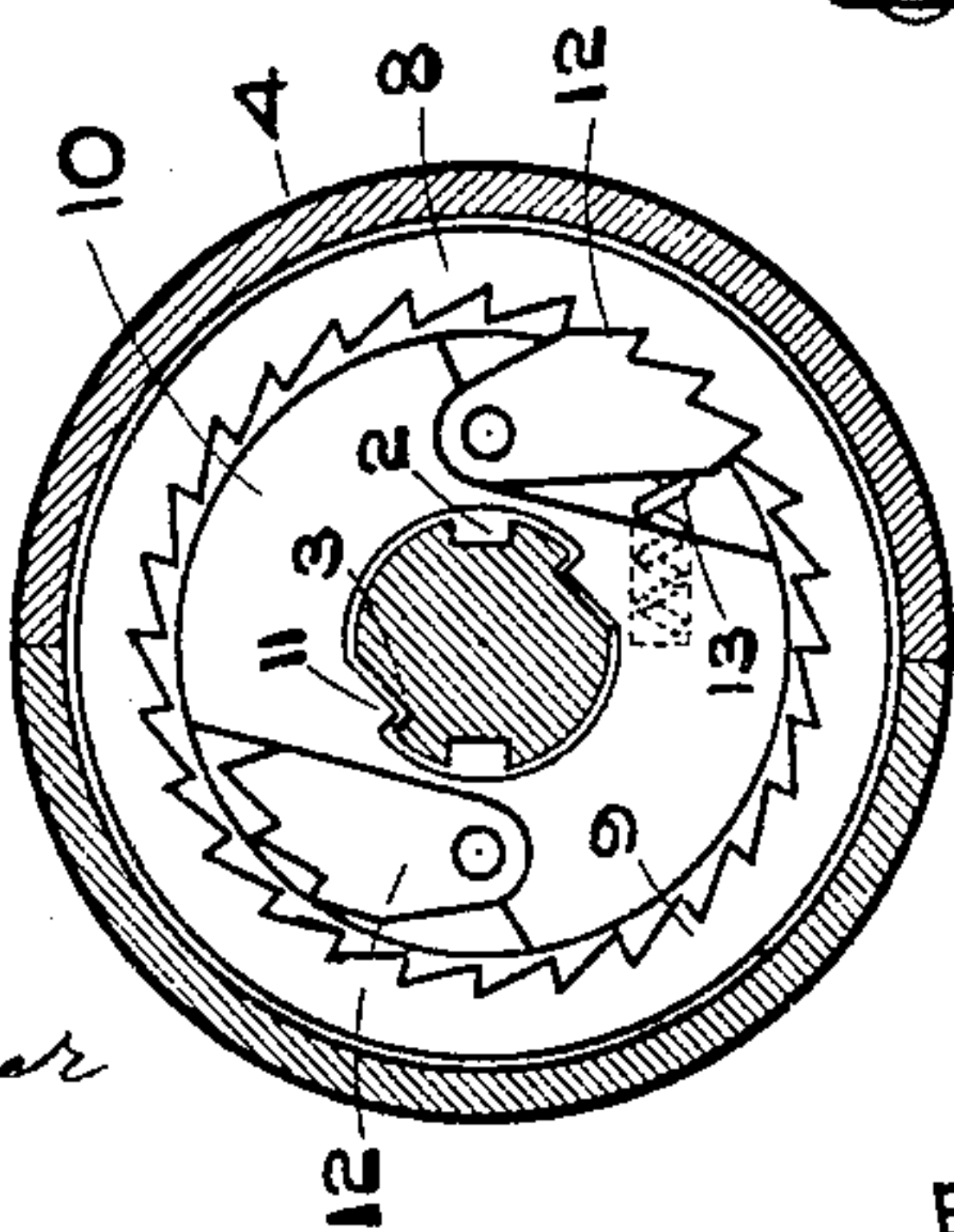


FIG. 2

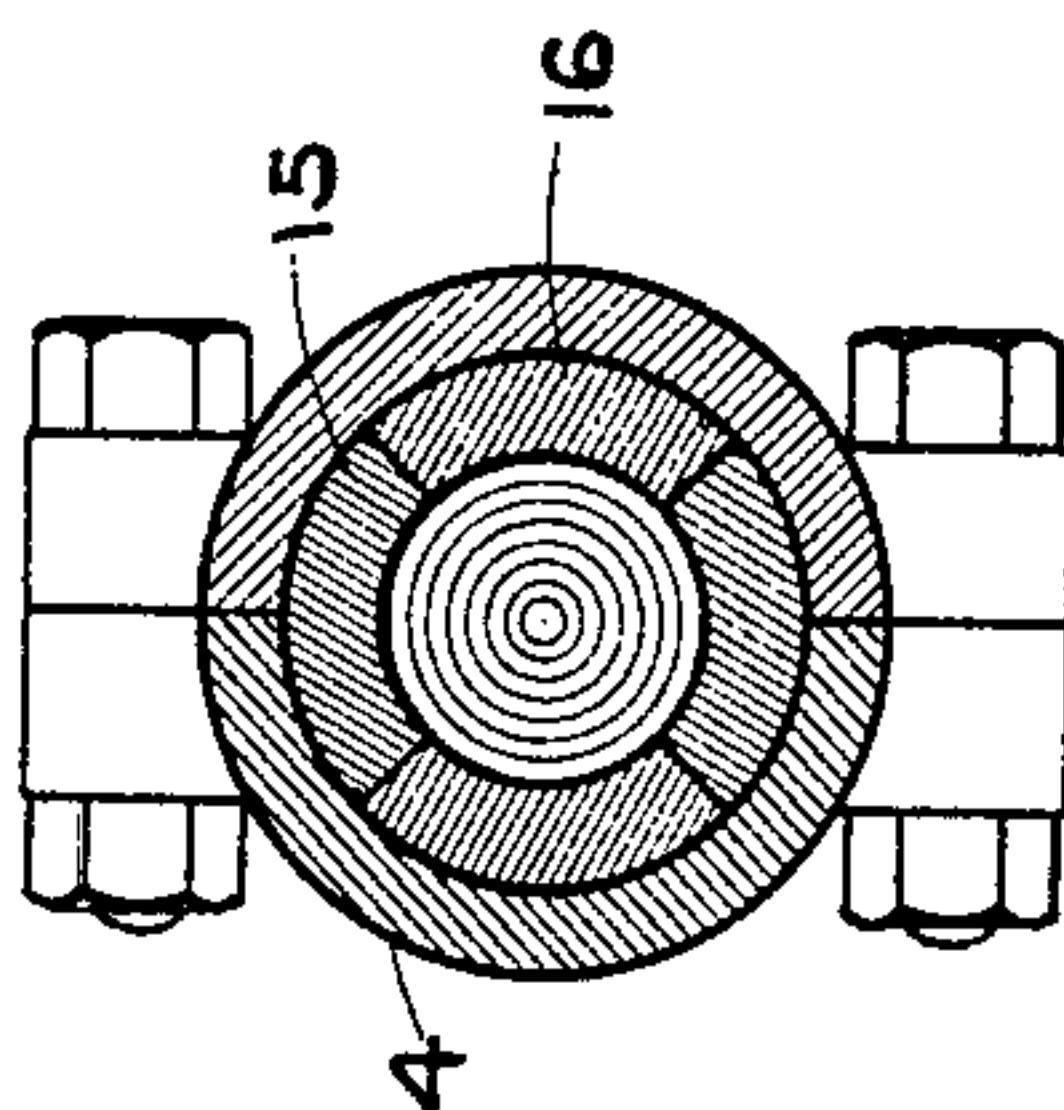


FIG. 4

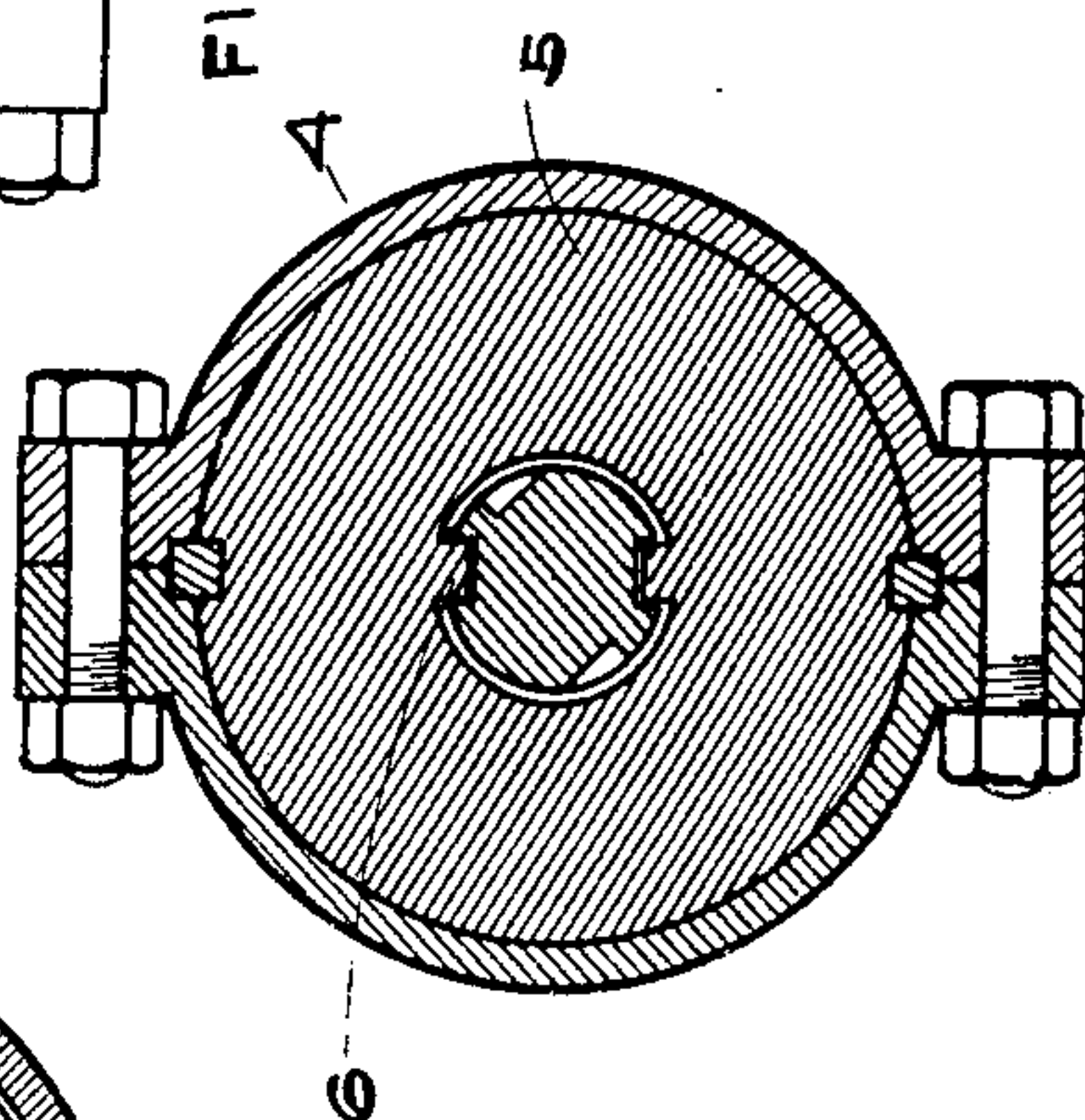


FIG. 3

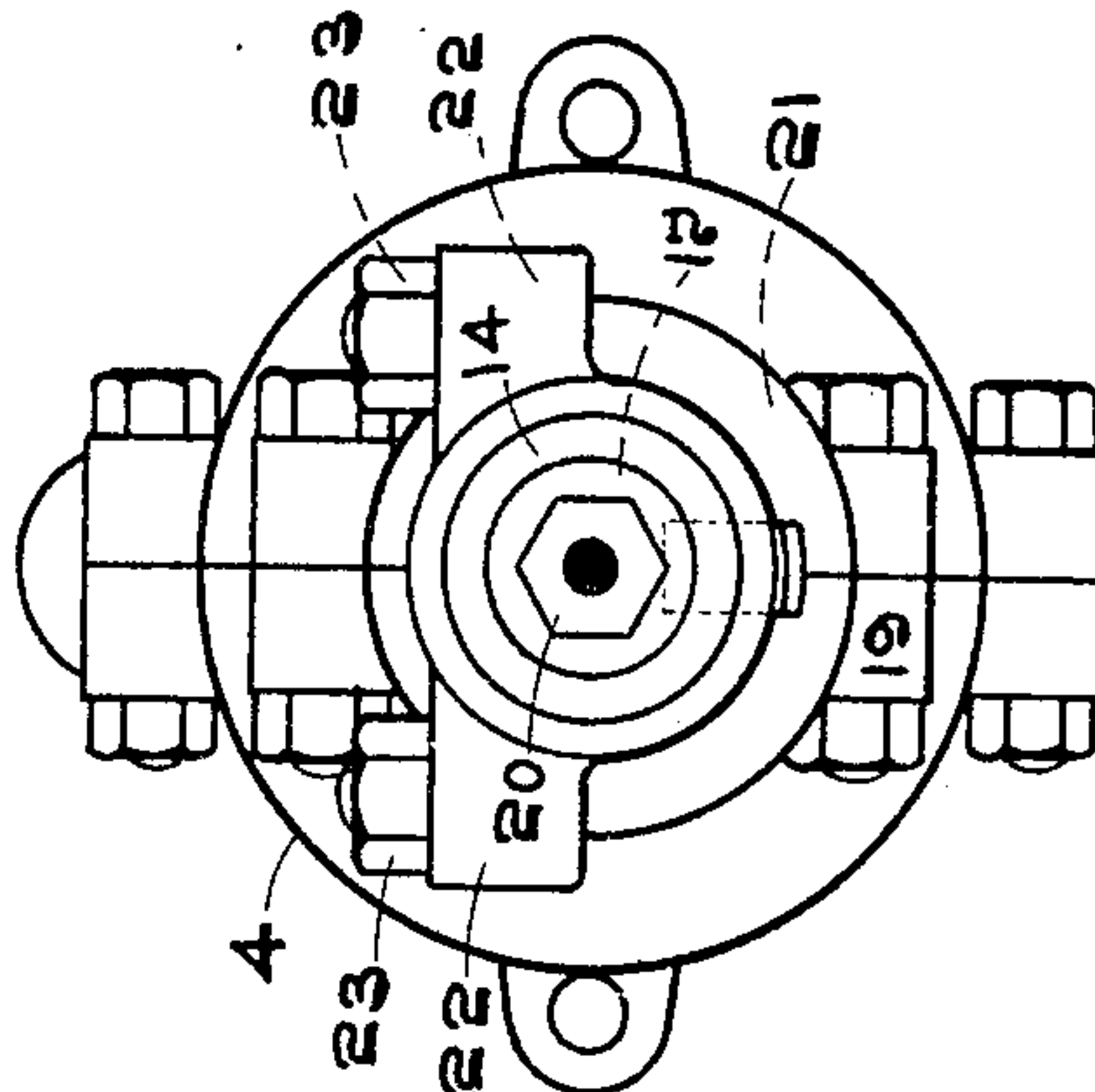


FIG. 6

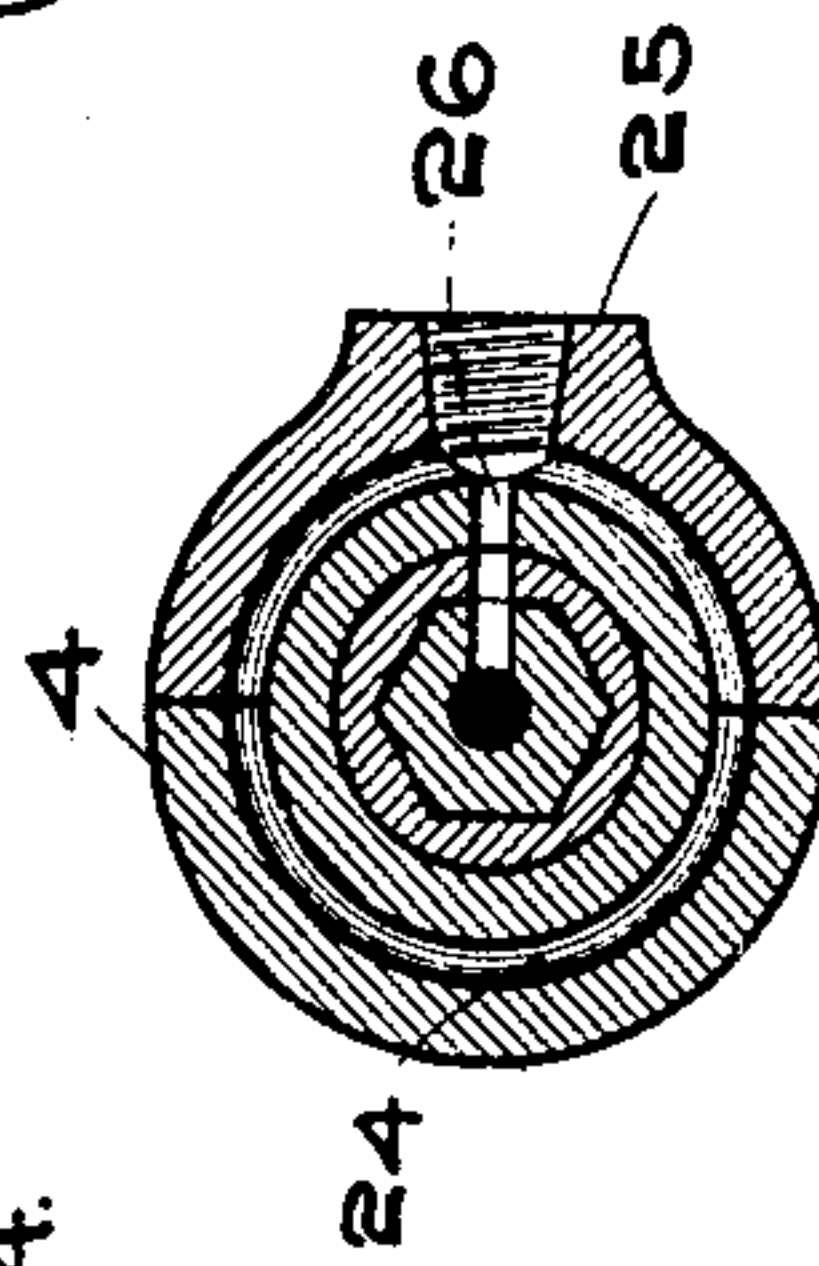


FIG. 5

WITNESSES

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2 SHEETS—SHEET 2.

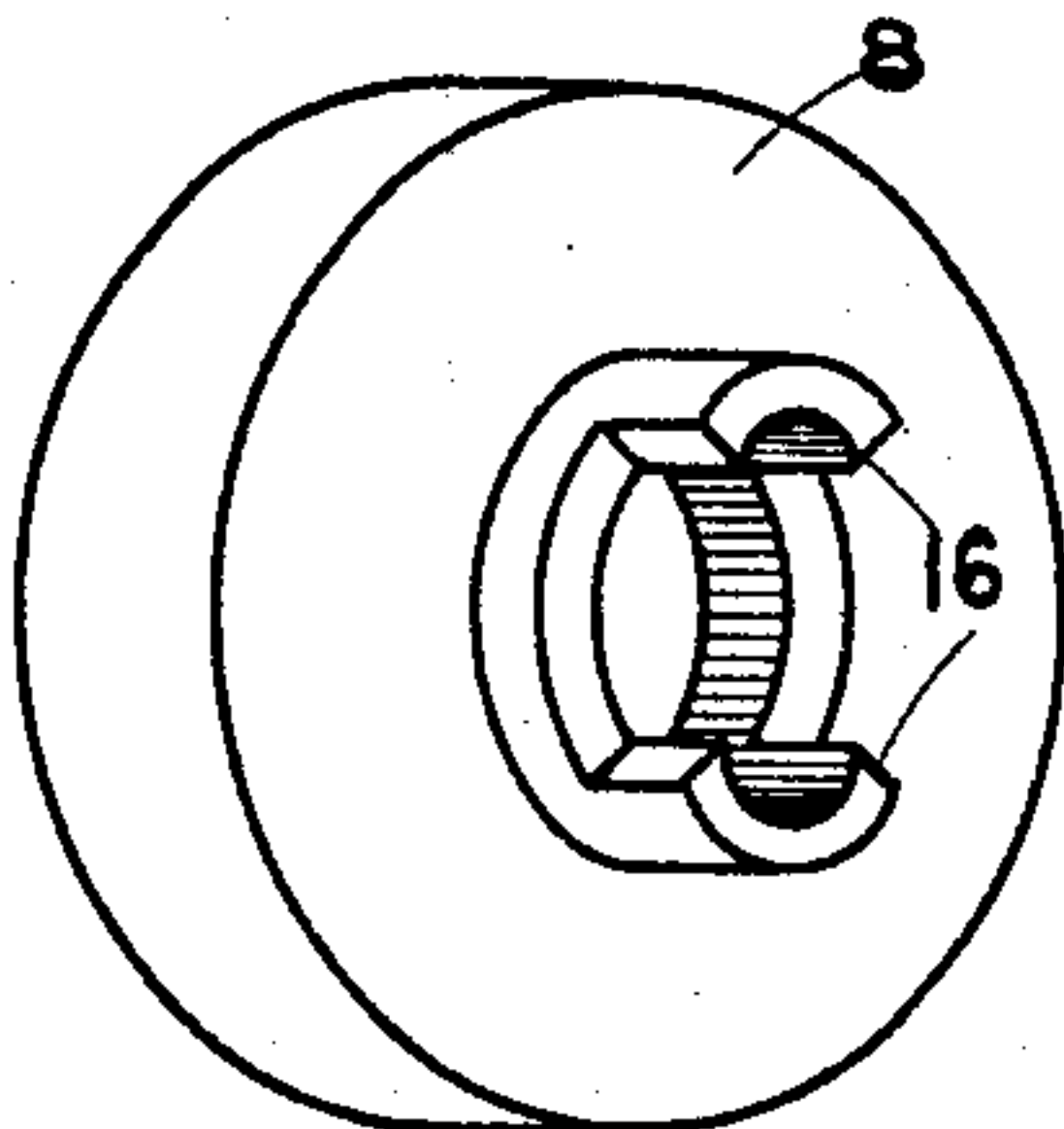


FIG. 7

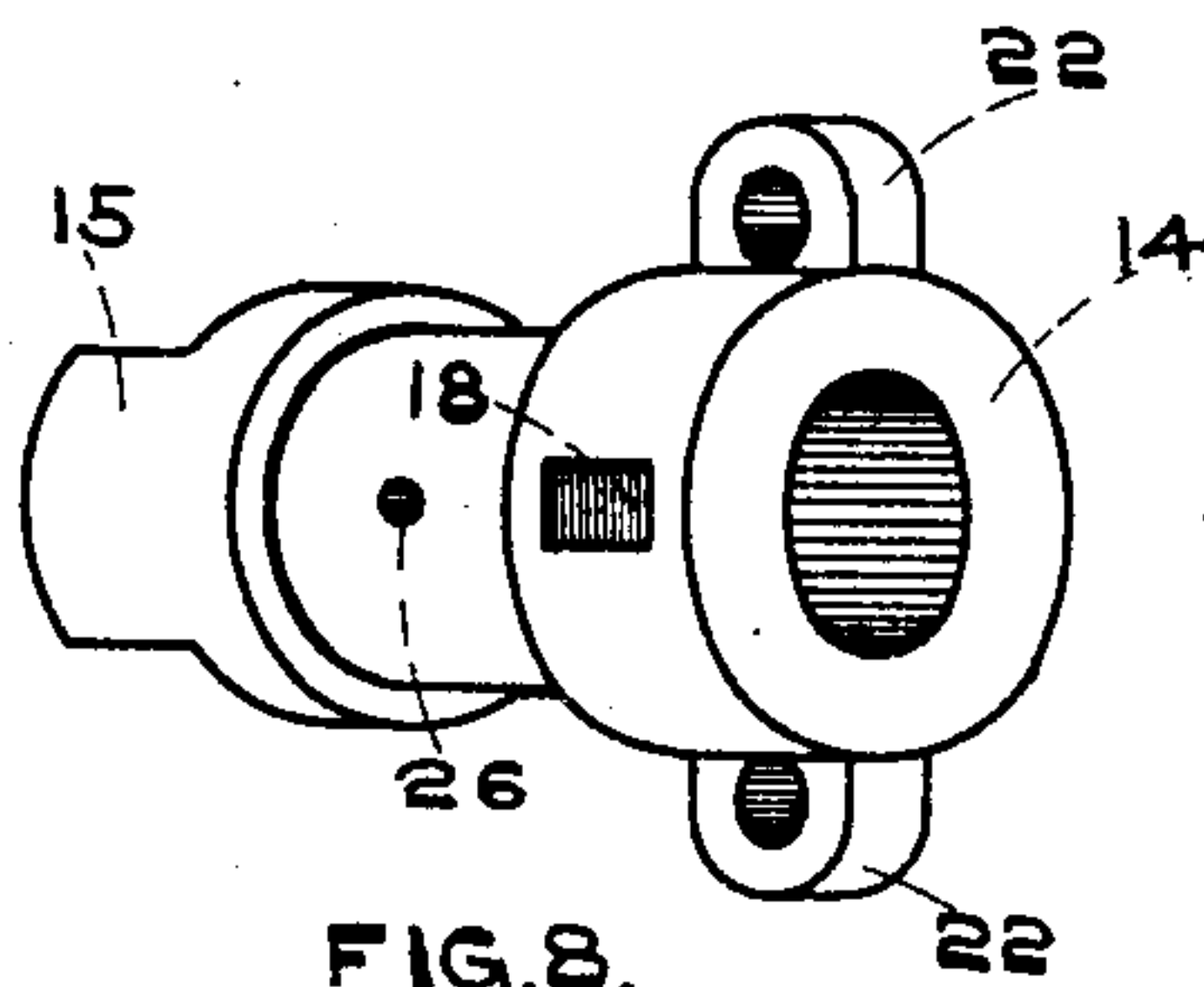


FIG. 8.

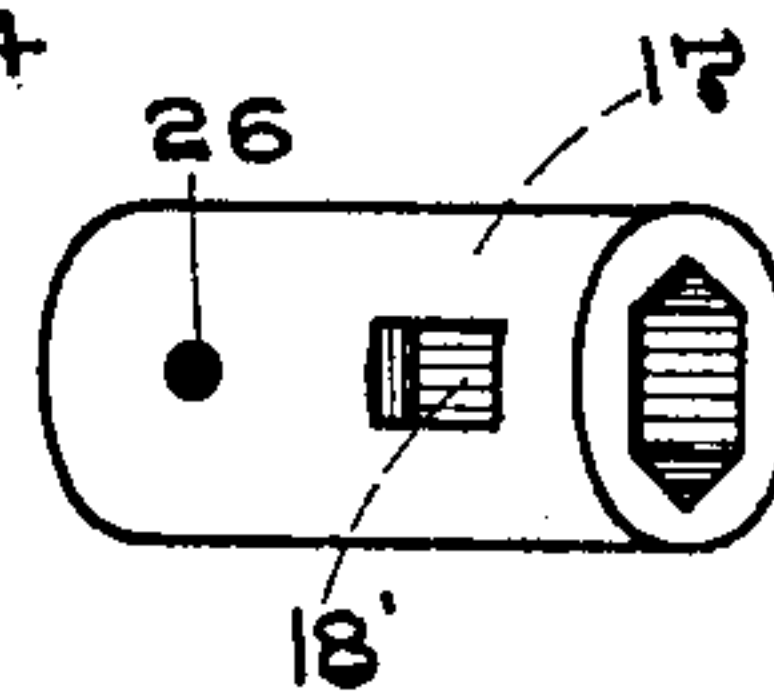


FIG. 9.

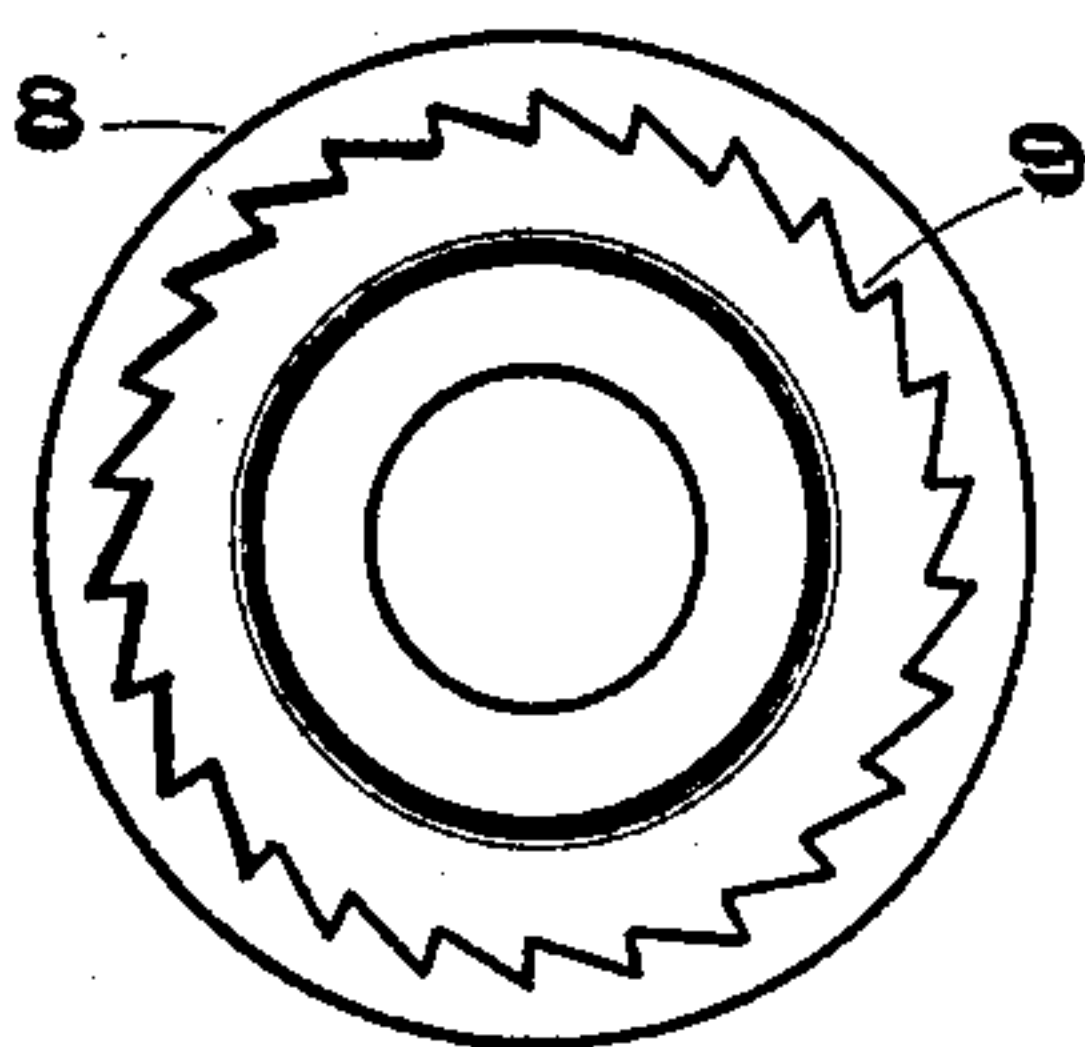


FIG. 10.

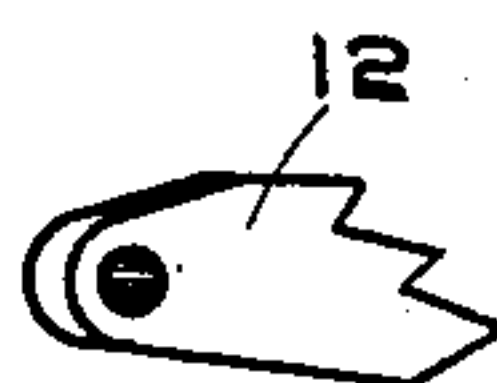


FIG. 12

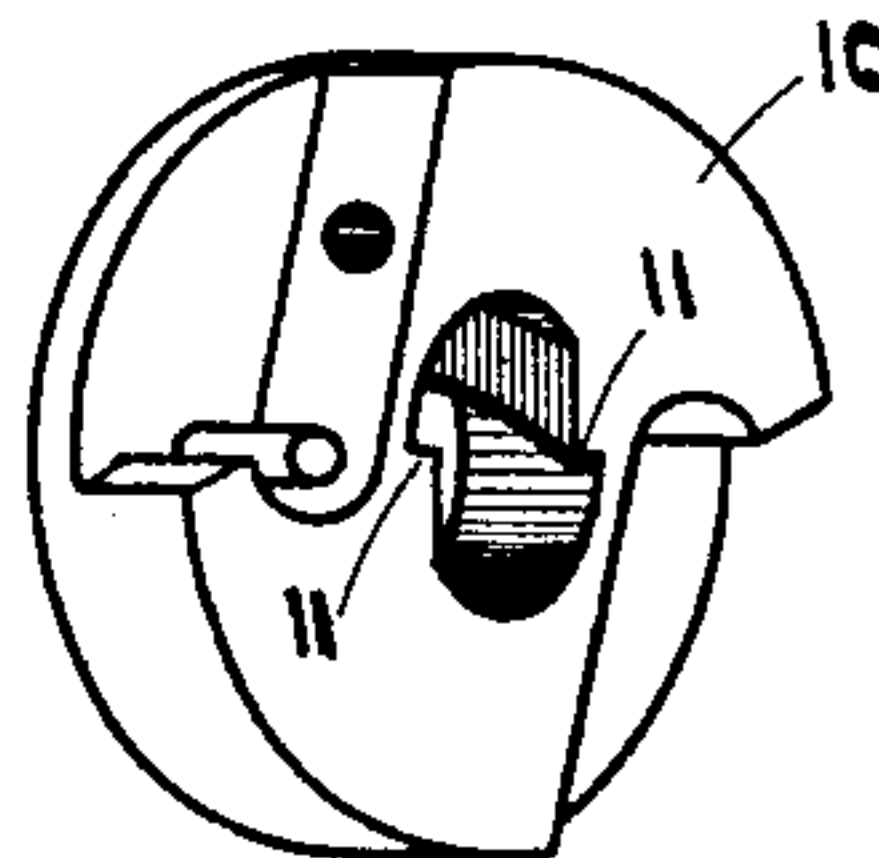


FIG. 11.

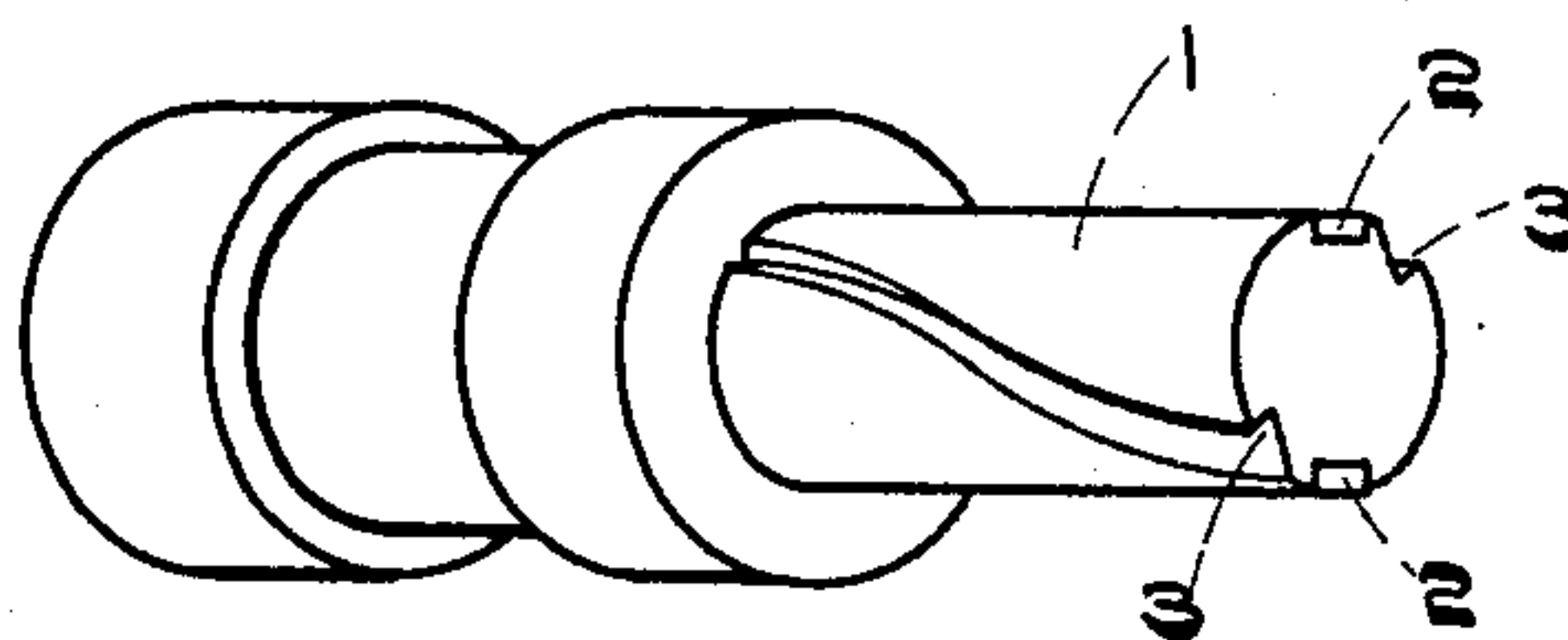


FIG. 13.

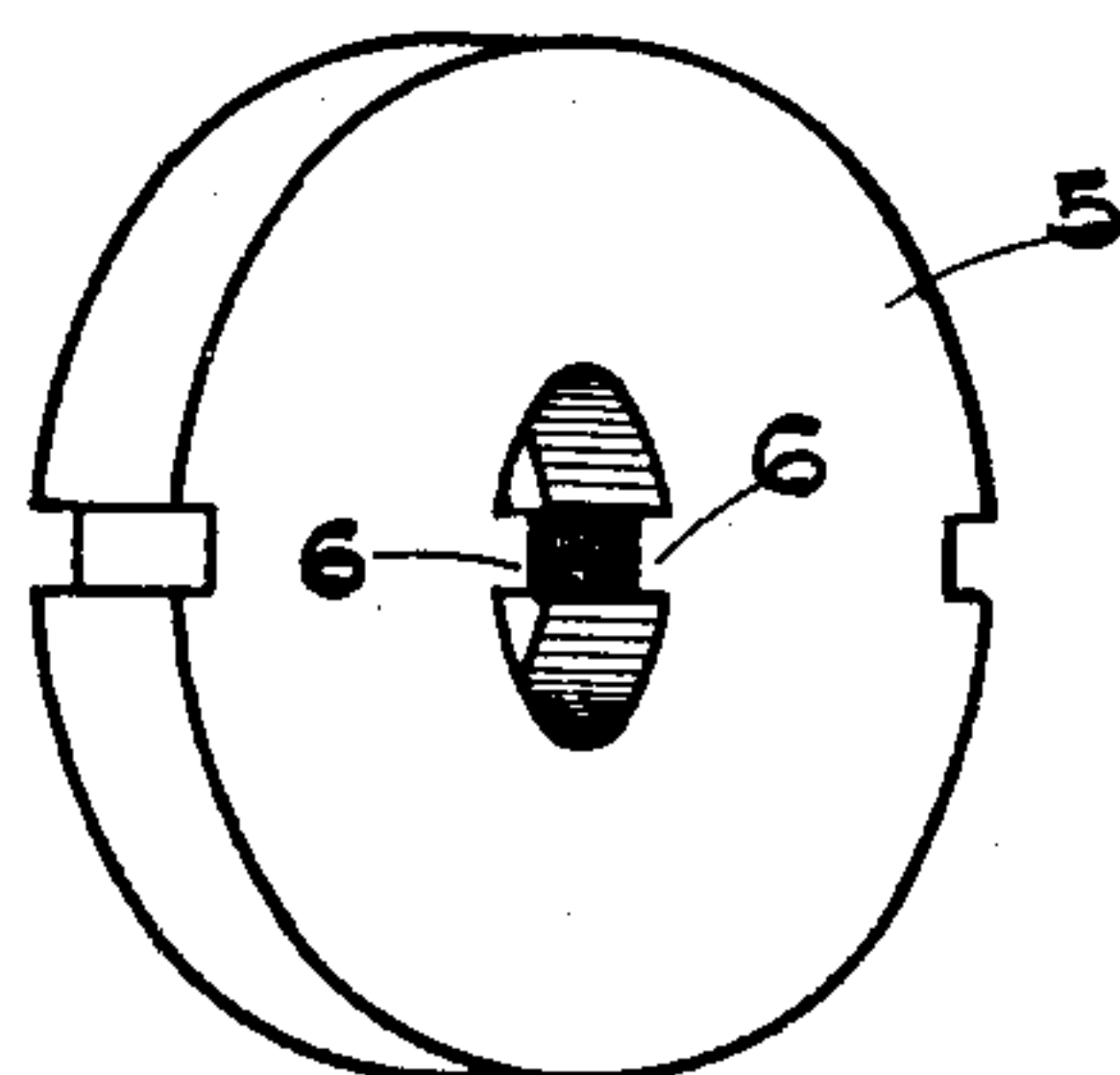


FIG. 14

WITNESSES

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GEORGE H. GILMAN, OF FRANKLIN, PENNSYLVANIA.

COMBINED CHUCK AND ROTATING DEVICE FOR ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 771,218, dated September 27, 1904.

Application filed October 29, 1903. Serial No. 178,969. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. GILMAN, a citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in a Combined Chuck and Rotating Device for Rock-Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a combined chuck and rotating device for rock-drills and will be fully understood from the following specification, reference being had to the accompanying drawings, which form a part thereof, and which is sufficiently full, clear, and exact to enable one skilled in the art to which it appertains to make and use the same.

In said drawings, Figure 1 is a longitudinal section of a complete rock-drill embodying my invention. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a section on line 4 4 of Fig. 1. Fig. 5 is a section on line 5 5 of Fig. 1. Fig. 6 is an end elevation. Fig. 7 is a perspective view of the lower end of the ratchet-wheel. Fig. 8 is a perspective view of the chuck. Fig. 9 is a perspective view of the chuck-bushing. Fig. 10 is an internal view of the ratchet-wheel. Fig. 11 is a perspective view of the rotating plate. Fig. 12 is a perspective view of a pawl. Fig. 13 is a perspective view of the piston and hammer. Fig. 14 is a perspective view of the guide-plate.

The same reference-figures indicate identical parts in the several views.

The object of my invention is to provide an efficient and durable chuck and rotating device for rock-drills, and the device herein shown is constructed substantially as follows:

The contracted or hammer end of the piston of a rock-drill has formed therein one or more straight longitudinal grooves 2 and one or more spiral grooves 3. In the casing of the rock-drill 4, immediately at the end of the cylinder in which the piston reciprocates, is rigidly placed a guide-plate 5, through which the hammer 1 of the piston is adapted to reciprocate, and through the opening through which said hammer reciprocates there is one

or more inwardly-projecting keys 6, adapted to seat in the longitudinal groove 2 of the hammer to prevent the piston from turning. Immediately below the guide-plate 5 is a loosely-disposed washer 7, against which the upper face of the ratchet-wheel 8 bears. Said ratchet-wheel 8 is chambered out on the upper side, and ratchet-teeth 9 are formed internally in said chamber. Within said chamber is rotatively seated the rotating plate 10, through which hammer 1 is also adapted to reciprocate. The hole in the rotating plate through which the hammer plays has formed therein one or more inwardly-projecting spiral flukes 11, adapted to seat in the spiral grooves 3 of the hammer. Upon the rotating plate 10 are mounted two outwardly-facing pawls 12, adapted to engage teeth 9 of the ratchet-wheel 8.

From the foregoing description it will be readily understood that by reason of the keys 6 of the guide-plate being seated in the longitudinal grooves 2 of the hammer said hammer is prevented from turning and that by reason of the spiral flukes 11 of the rotating plate 10 being seated in the spiral grooves 3 of the hammer said plate is caused to semi-rotate back and forth with the reciprocations of the hammer, and as the rotating plate moves in one direction (preferably that caused by the receding stroke of the hammer) the pawls 12 are caused to engage the teeth 9 of the ratchet and carry said ratchet-wheel forward in unison with the rotating plate, and as said plate moves in the opposite direction the pawls 12 ride over the teeth 9 and the ratchet-wheel remains stationary. A spiral spring 13 is placed back of each pawl to hold it to its work. In Fig. 2 one pawl is shown engaged and the other disengaged for the sake of clearer illustration.

Below the ratchet-wheel 8 in case 4 is revolvably mounted the drill-chuck in such a manner as to also have some longitudinal or endwise movement. Upon the upper end of said chuck are formed two jaws 15, which engage with two similar jaws 16, formed upon the under side of ratchet-wheel 8, by which means the rotation of said ratchet-wheel is transmitted to the chuck and the longitudinal

movement of the chuck aforesaid is provided for, as will be understood by an inspection of Fig. 1. The lower end of the chuck is centrally bored for the reception of a removable bushing 17, which is adapted to the reception of the shank of a drill-bit, and said bushing may have therein any shape of hole to conform to the shape of the stock used in the bit, and by providing bushings with square, hexagon, or round holes the drill may be readily and quickly adapted to any shape of drill. The chuck has a lateral key-seat 18 formed through the side thereof for the reception of the key 19, which also passes through the hole 18' of the bushing, which key is adapted to bear against the shank of the bit 20 to secure the same in place and serves also to hold bushing 17 in place. Key 19 is caused to press against the shank of the bit by means of the U-bolt 21, with its ends inserted in the eyes 22 22 or any equivalent feature, and nuts 23 23 are placed upon screw-threaded ends of the bolt to tighten the same in position.

To provide for the use of a hollow drill-bit and to supply the same with water or air to clean out the drill-hole, I form within the case 4 at line 5 5 an annular groove 24 and communicate thereto with a pipe-tap 25, and through the chuck 14, bushing 17, and bit 20 is formed a lateral registering drill-hole 26, which is always in register with said annular groove 24 in the casing, and water or air introduced through a pipe screwed into the tap 25 will always have free access to the central longitudinal hole of a hollow bit.

Be it understood that I do not wish to confine the application of my device to such a type of drill only as is shown in Fig. 1, as there are drills of the valveless type which are equally as well adapted to the application of my device, and it will thus be further understood that what I claim, and desire to secure by Letters Patent, is the combined rotating device and chuck here shown without reference to the type of drill to which it is applied.

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

1. In a combined chuck and rotating device for rock-drills, a piston operably seated in a cylinder, the hammer of said piston, said hammer having one or more straight grooves and one or more spiral grooves upon its periphery, the cylinder aforesaid, a guide-plate rigidly mounted in said cylinder, there being a hole

in said plate through which said hammer is adapted to reciprocate, keys in said plate adapted to seat in the straight grooves aforesaid, a rotating plate rotatably mounted in said cylinder, there being a hole in said plate through which said hammer is adapted to reciprocate, spiral flukes in said plate adapted to seat in the spiral grooves of the hammer, whereby said plate is adapted to be rotated, in combination with a chuck adapted to be rotated by said rotating plate.

2. In a combined chuck and rotating device for rock-drills, a piston or hammer having one or more straight longitudinal grooves therein and one or more spiral grooves therein, a guide-plate rigidly mounted within the case of said drill and having a central opening through which said hammer is adapted to reciprocate, keys projecting into said opening and adapted to seat in the straight grooves aforesaid, a chambered ratchet-wheel revolvably seated within the case of said drill, ratchet-teeth projecting into the chamber of said wheel, a rotating plate operably seated in said chamber and having a central opening through which said hammer is adapted to reciprocate, spiral flukes projecting into said opening and adapted to seat in said spiral grooves, pawls mounted upon the rotating plate and adapted to engage with the teeth in the ratchet-wheel, jaws formed upon the lower face of said wheel, in combination with a chuck operably mounted in the case aforesaid, jaws upon the upper end of said chuck adapted to engage with the jaws upon the ratchet-wheel, a removable bushing mounted in the outer end of said chuck adapted to the reception of the shank of a drill-bit, means of securing said bushing and said bit in position.

3. In a combined chuck and rotating device for rock-drills, a cylinder, a piston reciprocally and non-rotatably mounted therein, a hammer or piston-rod integral with said piston, a plate rotatably mounted in said cylinder, there being a hole through the center of said plate through which said hammer is adapted to reciprocate, means upon the periphery of said hammer of imparting a semirotating motion to said plate, in combination with a chuck adapted to be rotated by said plate.

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

GEORGE H. GILMAN.

Witnesses:

E. R. INMAN,

LAURA S. INMAN.