

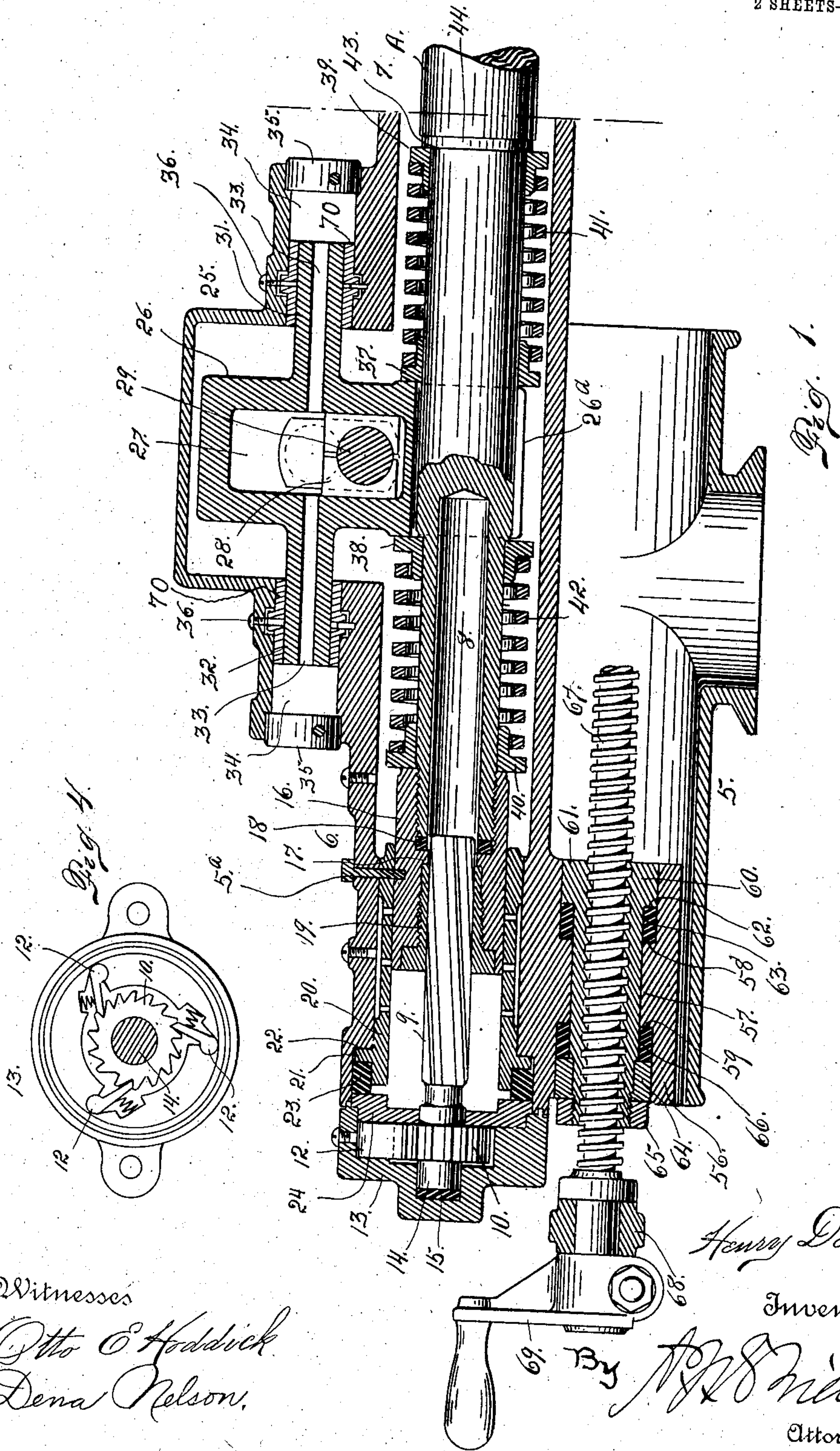
No. 833,875.

PATENTED OCT. 23, 1906.

H. DEITZ.
ROCK DRILL.

APPLICATION FILED JAN. 10, 1905.

2 SHEETS—SHEET 1.



Witnesses
Otto C. Haddick
Dena Nelson.

H. Deitz.
Inventor
By [Signature]
Attorney

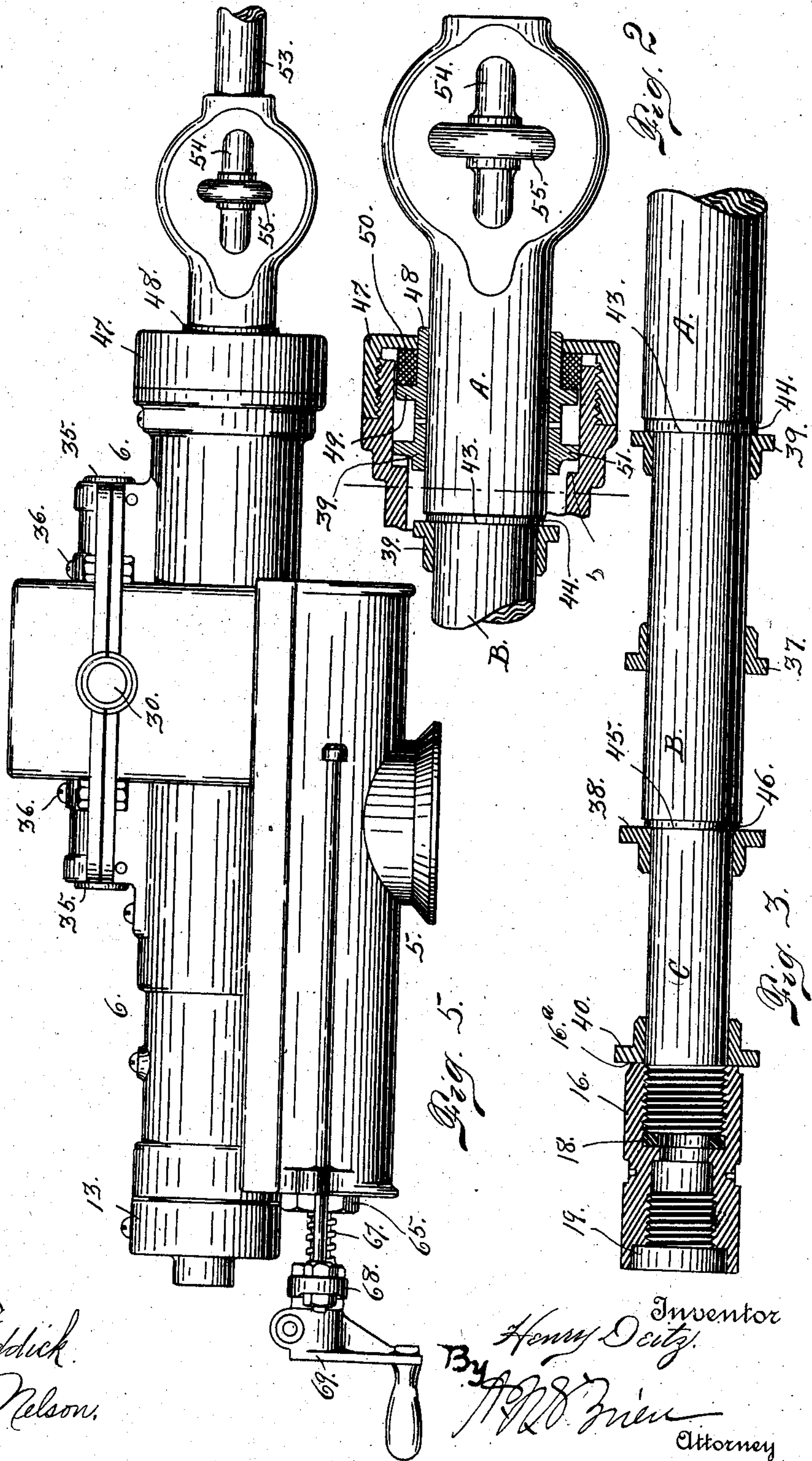
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Witnesses
Otto E. Haddock.
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UNITED STATES PATENT OFFICE.

HENRY DEITZ, OF DENVER, COLORADO, ASSIGNOR TO ANNA THERESA DEITZ, OF DENVER, COLORADO.

ROCK-DRILL.

No. 833,875.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed January 10, 1905. Serial No. 240,516.

To all whom it may concern:

Be it known that I, HENRY DEITZ, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Rock-Drills; and I do 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 the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in rock-drills of the class set forth in Patent No. 768,894, issued to me August 30, 1904.

My present invention consists of certain novel features of construction, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a section taken through a drill equipped with my improvements, the forward extremity of the mechanism being broken away. Fig. 2 illustrates the part broken away and not shown in Fig. 1. Fig. 3 is a detail view of the reciprocating drill-holder or piston. Fig. 4 is a detail view of the rear cap or closure of the drill-casing, illustrating the ratchet mechanism and the rifle-bar for rotating the piston or drill-holder. Fig. 5 is a side elevation of my improved drill.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the guide-shell which is relatively stationary during the operation of the machine. As nothing new is claimed on the manner of supporting the guide-shell in place, the supporting mechanism is not illustrated. Slidably mounted on the guide-shell is the casing 6, in which is located the piston or drill-holder 7, whose rear extremity is bored out or formed hollow, as shown at 8, to receive a rifle-bar 9, to whose rear end is attached a ratchet-wheel 10, which is engaged by spring-actuated dogs 12, mounted in the cap 13, which closes the rear end of the casing. The rear extremity of the rifle-bar protrudes beyond the ratchet, as shown at 14, and engages a fiber washer 15, located in a recess formed in the rear ex-

tremity of the cap. The rear end of the drill-holder is connected with a sleeve 16, the drill-holder being threaded exteriorly to engage corresponding interior threads formed in the sleeve. Between the rear end of the drill-holder and an interior shoulder 17, formed on the sleeve, is fiber washer 18. Screwed into the rear extremity of the sleeve 16 is a bushing 19, grooved to engage the rifle-bar 9 for the purpose of rotating the drill-holder in a manner that will be readily understood. In the rear end of the casing is located a bushing 20. The rear end of this bushing is provided with a collar 21, which engages a shoulder 22 in front and a rubber buffer 23 in the rear. In the rear of the buffer is located a disk 24, which occupies a position forward of the ratchet 10 and holds the dogs 12 in place.

Mounted on the body of the casing is an auxiliary casing 25, in which is located a reciprocating yoke 26, provided with a slot 27, in which is placed a movable journal-box 28, through which passes the crank 29 of the operating crank-shaft 30. As the crank-shaft is rotated the yoke is reciprocated. This yoke is provided with forwardly and rearwardly projecting parts 31 and 32, which are provided with central openings 33, communicating with the slot 27 of the yoke at one extremity and with the extremities of the yoke-chambers 34 at their opposite extremities. These supporting parts 31 and 32 move in bushings 70, with which the casing extremities are provided. The extremities of the yoke-chamber are closed by plugs 35. This yoke-casing is provided with oil-orifices normally closed by screws 36. By removing these screws the necessary oil or lubricating material may be introduced to the yoke-chamber. The lower extremity of this yoke straddles the drill-holder and engages collars 37 and 38, which surround the drill-holder on opposite sides of the yoke. The drill-holder is also surrounded by forward and rearward collars 39 and 40. Between the collars 37 and 39 is located a coil-spring 41, while between the collars 38 and 40 is located a similar spring 42. The collar 39 engages a shoulder 43, formed on the drill-holder. Between the body part A of the drill-holder and the shoulder 43 the drill-holder is reduced in size, as shown at 44, in

order to prevent the forming of burs projecting beyond the part A of the holder, whereby the removal of the latter from the casing might be obstructed. The difference in diameter between the shoulder 43 and the body part A is sufficient to prevent the formation of burs of such size as to project beyond the body part A. It will be understood that as the shoulder 43 bears against the collar 39 the burs, if any are formed, will be at the said shoulder.

The collar 38 bears against a shoulder 45, which is of less diameter than the part B of the drill-holder, the latter being reduced, as shown at 46, between the collar and the part B to prevent the formation of burs at the collar 38, which would project beyond the part B of the drill-holder.

The forward extremity of the casing 6 is provided with a screw-cap 47. In this forward part of the casing is placed a bushing 48, having an integral collar 49, which engages a rubber buffer 50, located between the collar and the cap 47. The rear end of this bushing engages the loose collar 39 to limit the forward movement of the latter during the operation of the machine. The rear part of the bushing 48 is also provided with an integral collar 51, which engages a shoulder 52, formed on the casing, whereby the bushing is confined within narrow limits.

The drill bit or tool 53 is connected with a drill-holder by means of a locking device 54, held in place by a U-shaped bolt 55.

The rear extremity of the drill-casing is provided with a depending hollow part 56, having an interiorly-projecting part 57, forming shoulders 58 and 59. Within this part 56 is located a feed-nut 60, whose forward extremity is enlarged, as shown at 61, to form a shoulder 62. Between the shoulders 58 and 62 is located a rubber buffer 63. To the rearward extremity of the feed-nut is applied a washer 64, held in place by a nut 65, screwed upon the rear extremity of the feed-nut whereby the washer is held in place. Between the washer and the shoulder 59 is located a rubber buffer 66.

The feed-screw 67 passes through the feed-nut and is journaled in a part 68, suitably connected with the guide-shell, whereby it is relatively stationary. To the rear extremity of the feed-screw is attached a hand-crank 69 for operating the said screw, whereby the casing may be moved back and forth on the guide-shell at the will of the operator.

The rubber cushions interposed between the forward and rear extremities of the feed-nut and the casing prevent the vibrations incident to the operation of the machine from being transmitted to the hand of the operator upon the crank of the feed-screw. This construction also prevents injury to the mechanism incident to said vibrations.

Attention is called to the fact that the drill-

holder or piston is so constructed that it may be unscrewed from the sleeve 16 and withdrawn from the casing by pulling it forwardly. To this end the drill-holder is composed of forward, middle, and rear parts A, B, and C of different diameters, which makes it practicable to form the shouldered parts of the drill-holder of less diameter than the parts A and B immediately forward of them, whereby the formation of burs is prevented that otherwise might prevent the removal of the drill-holder from the rear, as heretofore explained.

It is often desirable to remove the piston or drill-holder 7 without taking the machine apart. In this event it is necessary to unscrew the drill-holder from the sleeve 16. In order to prevent this sleeve from turning during the operation of unscrewing the drill-holder therefrom, I drop a pin 5^a into registering openings formed in the casing, the sleeve 20, and the sleeve 16. This locks the last-named sleeve against rotation and allows the removal of the drill-holder or piston under the circumstances above stated. This pin 5^a is therefore not used when the machine is in operation, its only function being as above stated. The pin would of course be left in place when the drill-holder is again inserted and until the latter is screwed to position in the sleeve 16.

From the foregoing description the use and operation of my improved machine will be readily understood. As the crank-shaft 30 is rotated the crank 29 imparts a reciprocating movement to the yoke 26, which, acting on the collars 37 and 38, imparts a corresponding movement to the drill-holder through the instrumentality of the springs and collars 39 and 40, as will be readily understood.

As the drill-holder is moved forwardly to cause the drill bit or tool to act upon a rock it has no rotary movement; but during its rearward stroke the rifle-bar imparts the necessary rotary movement. The operator through the instrumentality of the feed-screw moves the drill-casing back and forth upon the guide-shell for the purpose of bringing the drill-casing into the proper relative position with reference to the breast of the rock.

Attention is called to the fact that the sleeve 16 where it is engaged by the collar 40 is provided with a reduced part 16^a to prevent the loose collar from upsetting the sleeve during the operation of the drill.

Having thus described my invention, what I claim is—

1. In a rock-drill, the combination with a guide-shell, casing, and reciprocating yoke, of a drill-holder mounted in the casing, collars loosely mounted on the holder and engaged by the yoke which is located between them, springs surrounding the drill-holder

and engaging the yoke-collars, other collars surrounding the drill-holder and engaging the spring extremities remote from the yoke, the foremost collar and the rear yoke-collar engaging shoulders on the drill-holder, the collars being in the rear of the shoulders and the portion of the drill-holder immediately forward of each shoulder being reduced for the purpose set forth.

2. In a rock-drill, the combination with a guide-shell, a casing, and a reciprocating yoke, of a drill-holder mounted in the casing, collars loosely mounted on the holder and engaged by the yoke which is located between them, springs surrounding the drill-holder and engaging the yoke-collars, other collars surrounding the drill-holder and engaging the spring extremities remote from the yoke, the foremost collar and the rear

yoke-collar engaging shoulders on the drill-holder.

3. In a machine of the class described, the combination of a casing, a drill-holder, a sleeve located in the casing in which the rear extremity of the drill-holder is threaded, a rifle-bar nut carried by the sleeve, the casing and sleeve being provided with registering openings, and a locking-pin adapted to engage said openings whereby the sleeve is locked against rotation while removing and inserting the drill-holder or piston, substantially as described.

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

HENRY DEITZ.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.