

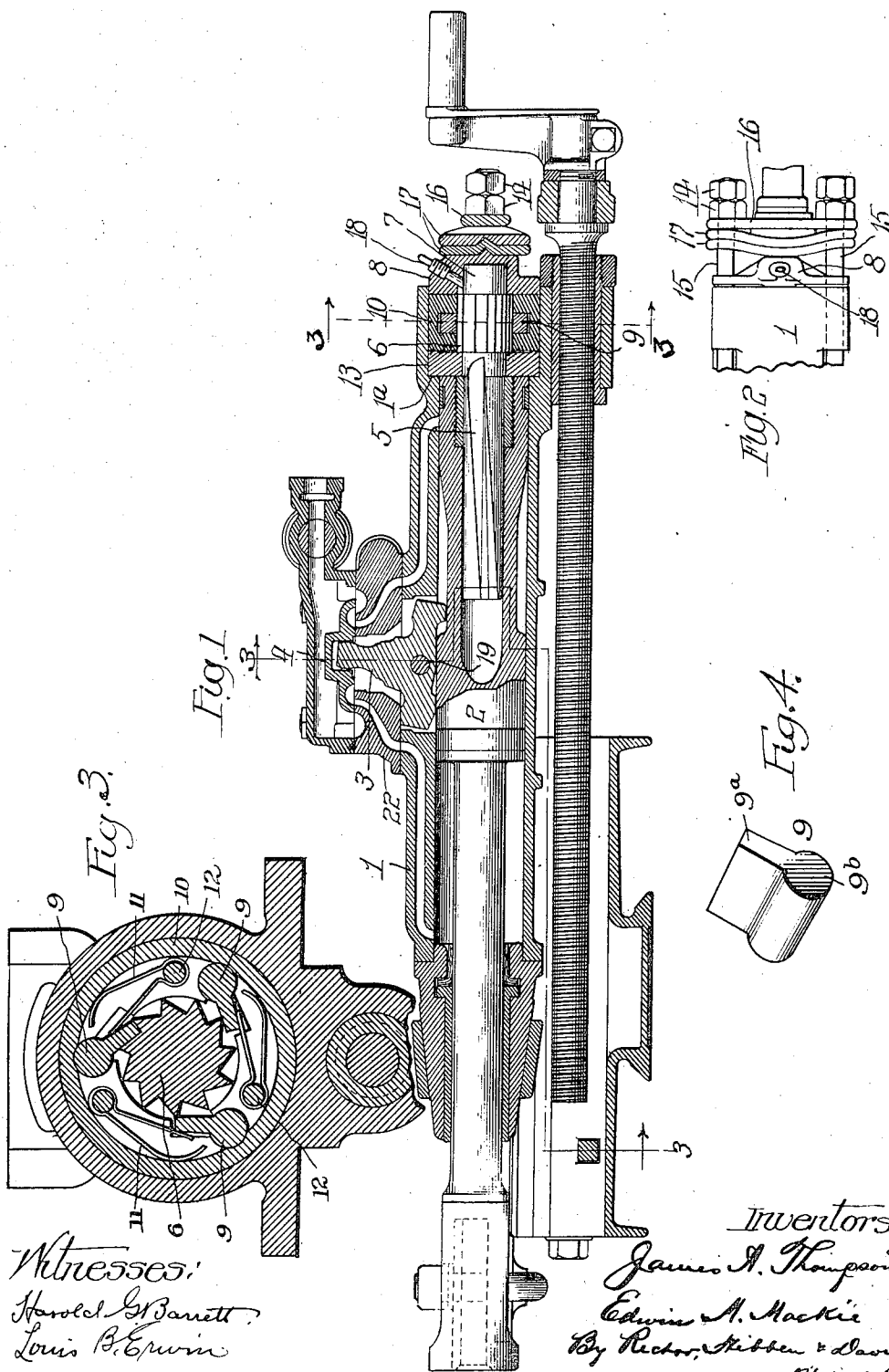
J. A. THOMPSON & E. M. MACKIE.

ROCK DRILL.

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1,065,007.

Patented June 17, 1913.



Witnesses:
Harold G. Barnett
Louis B. Egan

Inventors:
James A. Thompson
Edwin A. Mackie
By Richard Kibben & Davis
Their Attys.

UNITED STATES PATENT OFFICE.

JAMES A. THOMPSON AND EDWIN M. MACKIE, OF CHICAGO, ILLINOIS, ASSIGNORS TO
CHICAGO PNEUMATIC TOOL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF
NEW JERSEY.

ROCK-DRILL.

1,065,007.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JAMES A. THOMPSON and EDWIN M. MACKIE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

Our invention relates to rock drills and the object thereof is to improve the construction thereof in the several respects hereinafter described and more particularly for improving the mechanism associated with the rotating bar which rotates the working tool and its piston.

The various features of advantage and utility of our improved construction of rock drill will be apparent from the description hereinafter given.

In the drawings, Figure 1 is a central longitudinal section of a rock drill embodying our invention; Fig. 2 a plan view of the rear end thereof; Fig. 3 a section on the line 3—3 of Fig. 1 but made on a larger scale, and Fig. 4 a perspective of one of the ratchet pawls.

Inasmuch as our invention concerns only certain parts of features of a rock drill, only those parts of the drill which are more or less particularly concerned in the explanation of the parts or features constituting our invention will be described. Therefore in referring to the old parts it will be sufficient to say that the cylinder 1 is provided with the usual piston 2, tappet-actuated rocker 3 and distributing valve 4 which is operated by such rocker and which controls admission and exhaust of fluid pressure to and from opposite ends of the cylinder for the proper reciprocation of the piston and the working tool or drill carried thereby. The rifle or rotating bar 5 is associated and coöperates with the piston in the usual and well-known manner, but new and improved ratchet mechanism is provided therefor.

As clearly indicated in Fig. 1, the rotating bar is provided with a ratchet 6 which may be integral therewith or formed separately and securely fixed thereto, as may be desired, such bar being extended on its outer end to provide a bearing in the pressure plate 8. Coöperating with the ratchet 6 is a series of pawls 9 which are made of the peculiar shape shown in Figs. 4 and 5 for a purpose

hereinafter made apparent. Each pawl has a flat rectangular portion 9^a which directly coöperates with the ratchet and also a tubular portion 9^b along one of its longitudinal edges. This tubular portion of each ratchet forms the bearing portion thereof and the same is arranged to be slipped in sidewise into a socket corresponding thereto in the inner surface of a ring 10, which will be hereinafter referred to as a slip ring owing to its capability of slipping under certain conditions as hereinafter explained. This slip ring fits within the outer end of the cylinder 1 and surrounds the ratchet portion of the rotating bar. Each pawl is provided with a suitable spring such as spring 11 for the purpose of holding the same inwardly toward the ratchet with a yielding pressure so as to engage the ratchet teeth and prevent backward rotation of the rotating bar. In the present instance each spring 11 is provided with two leaves or portions coiled around a pin 12 in the slip ring, one leaf pressing against one side of the flat portion of its pawl and the other leaf pressing against the inner surface of the slip ring, all as clearly indicated in Fig. 3. By reason of the peculiar shape of the ratchet and the bearing therefor, the same are reversible with the result that when one side of a pawl becomes worn out in service by the continual contact of the ratchet teeth, the same may be slipped out sidewise from the ring and then reversed and put back into place so as to present a new surface to the ratchet.

In order to take the end thrust of the slip ring we interpose between such ring and a shoulder 1^a of the cylinder a thrust ring 13 which also forms a bearing for the rotating bar at a point on the inner side of the ratchet. For applying the proper pressure to the slip ring pressure is applied to the plate 8 by screwing up the nuts 14 on the ends of the side rods 15 which causes the pressure to be transmitted to the plate 8 through the medium of the retaining bar 16 and the compression springs 17. The slip ring is therefore set or adjusted to resist a certain amount of pressure but it is arranged to slip when such predetermined pressure is reached or exceeded with the result that slippage will occur and breakage will be prevented. The pressure plate 8 is provided with a lubricating opening for lubricating

the bearing at the outer end of the rotating bar which opening is closed by a screw plug 18.

We claim:

- 5 1. In a rock drill, the combination, with the cylinder and the piston thereof, of a central rotating bar cooperating with the piston and having ratchets at its outer end, a ring arranged concentric of the bar adjacent the
10 ratchets thereof, said ring having an internal circumferential groove and transverse bearing sockets, and a series of spring-pressed pawls having bearing portions received by the sockets.
- 15 2. In a rock drill, the combination, with the cylinder and the piston thereof, of a central rotating bar cooperating with the piston and having ratchets at its outer end, a ring arranged concentric of the bar adjacent the ratchets thereof, said ring having
20 an internal circumferential groove and transverse bearing sockets, a series of reversible pawls having bearing portions received by the sockets, and springs located in said groove and bearing against the pawls.
- 25 3. In a rock drill, the combination, with the cylinder and the piston thereof, of a central rotating bar cooperating with the piston, and ratchet and pawl mechanism cooperating with the bar and comprising a
30 ring fitted to slip within one end of the cylinder and having a series of oscillating pawls having bearing portions received by said sockets and adapted to engage the ratchet teeth, and means for applying a pre-
35 determined degree of spring pressure to the ring to normally prevent slipping thereof.

4. In a rock drill, the combination, with the cylinder and the piston thereof, of a central rotating bar cooperating with the
40 piston, ratchet and pawl mechanism cooperating with the bar and comprising a ring fitted to slip within one end of the cylinder and arranged concentric of the bar, ratchets on the bar within the ring, a series
45 of pawls bearing within the ring and cooperating with the ratchets, an end head received within the outer end of the cylinder and bearing against the outer face of the ring, and means for applying spring pres-
50 sure to said head.

5. In a rock drill, the combination, with the cylinder and the piston thereof, of a central rotating bar cooperating with the piston, ratchet and pawl mechanism co-
55 operating with the bar and comprising a ring fitted to slip within one end of the cylinder and arranged concentric of the bar, ratchets on the bar within the ring, a series of pawls bearing within the ring and co-
60 operating with the ratchets, an end head fitting within the outer end of the cylinder and bearing against the ring, bolts 15 connected with the cylinder, a cross bar 16, springs 17 strung on the bolts and inter-
65 posed between the cross bar and the head, and nuts 14 on the end of the bolts.

JAMES A. THOMPSON.
EDWIN M. MACKIE.

Witnesses:

ELMA A. KENEL,
PERCIVAL F. DOYLE.