H. EDGAR.

ROCK DRILL.

APPLICATION FILED DEC. 19, 1911.

1,088,334. **Patented Feb. 24, 1914.**

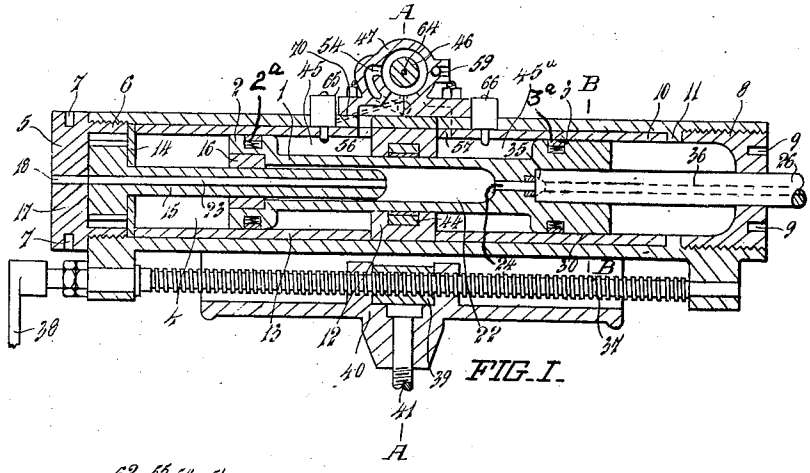


FIG. 1.

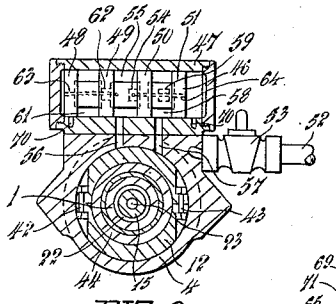


FIG. 2.

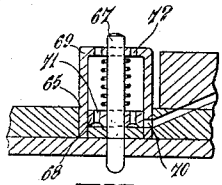


FIG. 3.

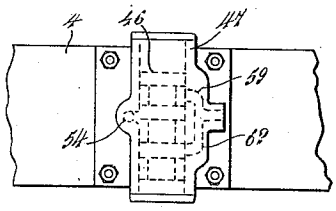


FIG. 4.

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UNITED STATES PATENT OFFICE.

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ROCK-DRILL.

1,088,334. Specification of Letters Patent. Patented Feb. 24, 1914.

Application filed December 19, 1911. Serial No. 666,675.

To all whom it may concern:

Be it known that I, HANS EDGAR, a citizen of the Dominion of New Zealand, and residing at Karangahake, in the Provincial District of Auckland, in the Dominion of New Zealand, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

This invention relates to rock drills and other pneumatic or fluid pressure tools or apparatus.

According to my invention, the cylinder in which the drill piston reciprocates is divided into two parts by a partition near its middle and the motive fluid is employed upon each side of this partition instead of upon the outer face of each end of the piston as has hitherto usually been the case.

The motive fluid is admitted to and exhausted from the cylinder by a reciprocating piston valve which is operated by the motive fluid through tappet valves actuated by the piston.

The invention is illustrated in the drawing wherein—

Figure 1, is a central sectional elevation of the drill, Fig. 2, a cross section on A—A, and Fig. 3, is an enlarged sectional elevation of a tappet valve, and Fig. 4, a plan of the middle part of Fig. 1.

The piston 1 having the heads 2 and 3 reciprocates within the cylinder 4 which at one end is closed by the cover 5 having an extension 6 which screws into the end of the cylinder and holes 7 by which it may be turned. The heads 2 and 3 are provided with packing rings 2^a and 3^a which may be of any usual form. The front cover 8 screws internally into the cylinder and is turnable for this purpose by a spanner or the like connected by means of the holes 9. The liner 10 fits within the cylinder, one end bearing against a flange ring 11 integral with the cylinder and the other end fitting closely against a partition 12 which fits the cylinder and is in turn held in position by a liner 13, held in position by a washer 14 in contact with said extension 6.

The automatic turning of the drill at each stroke is effected in a well known manner by the twist bar 15 working through a nut 16 secured in the piston head 2, having the usual ratchet wheel 17 upon its end, which is engaged by pawls located in the extension 6.

The drill is provided with the usual feed screw 37 turned by a handle 38 and working through a feed screw nut 39 carried in the usual manner in the cradle 40, which also has the usual supporting swivel bolt 41. To enable it to be placed in position the partition is in two parts held together by the bolts 42 and 43 arranged in recesses in the two parts (see Fig. 2) and packing material 44 placed in a recess provided for the purpose prevents passage of air from one side to the other.

The piston is reciprocated by compressed air alternately admitted to and exhausted from the spaces 45 and 45^a, and this is effected in the following manner, reference being made to Figs. 1, 2, 3 and 4. A piston valve 46 reciprocates within a casing 47 and has the heads 48, 49, 50 and 51. (See Fig. 2). Compressed air is supplied by a pipe 52 having a control cock 53 through a port 54 in the valve casing to the space 55 between the heads 49 and 50 and upon the reciprocation of the piston valve is alternately admitted to the spaces 45 and 45^a through the ports 56 and 57. While space 45 is receiving air through the port 56 and the space 55, exhaust air is passing from space 45^a through the port 57 and the space 58 between the heads 50 and 51 of the piston valve and thence through a port 59 in the casing to the atmosphere. When space 45^a is receiving air, exhaust air from the space 45 upon the opposite side of the partition is passing through a port 56 and the space 61 between the heads 48 and 49 of the piston valve, to the atmosphere through a port 62 in the casing. Compressed air is constantly admitted through longitudinal ports 63 and 64 from the space 55 to the ends of the piston valve and reciprocation is effected by establishing communication between the atmosphere and each end of the piston valve alternately. This is effected by similar tappet valves 65 and 66 one upon each side of the partition and shown in detail Fig. 3. The tappet pin 67 is struck and lifted by the piston head during its travel and a disk valve 68 in the cylindrical valve casing 69 and secured to the tappet pin uncovers a port 70 leading to one end of the piston valve and thereby opens communication to the atmosphere through passages 71 and 72 in the disk valve and casing respectively. Water may be supplied to the drill bit by means of passages 18 and 23, through the cover 5 and twist bar 15, and passages 24 and 36,

through the piston 1 and drill bit 26, the passages 23 and 24 opening into a recess 22 in the piston. The passage 18 may be connected to a water supply in any usual manner. The drill bit may be secured to the head 3 of the piston in any usual or convenient manner.

What I do claim and desire to secure by Letters Patent of the United States is:—

In a rock drill, the combination of a cylinder, a partition therein, an interior flange formed at one end of said cylinder, a liner between said flange and said partition, a liner arranged at the other side of said partition, a member removably secured in said cylinder at the other end thereof for holding said liners and partition in position, a piston slidable through said partition and having a head at each end fitting the interior surfaces of said liners, said partition dividing the space between the piston, liners and piston heads into two chambers, a passage leading directly into each of said chambers and means for directly introducing motive fluid alternately to said chambers, through said passages, for moving the piston in opposite directions.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

HANS EDGAR.

Witnesses:

ARTHUR HEWITT FERNEY HOUGH,

FLORA ELIZABETH MILNE WILSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."