

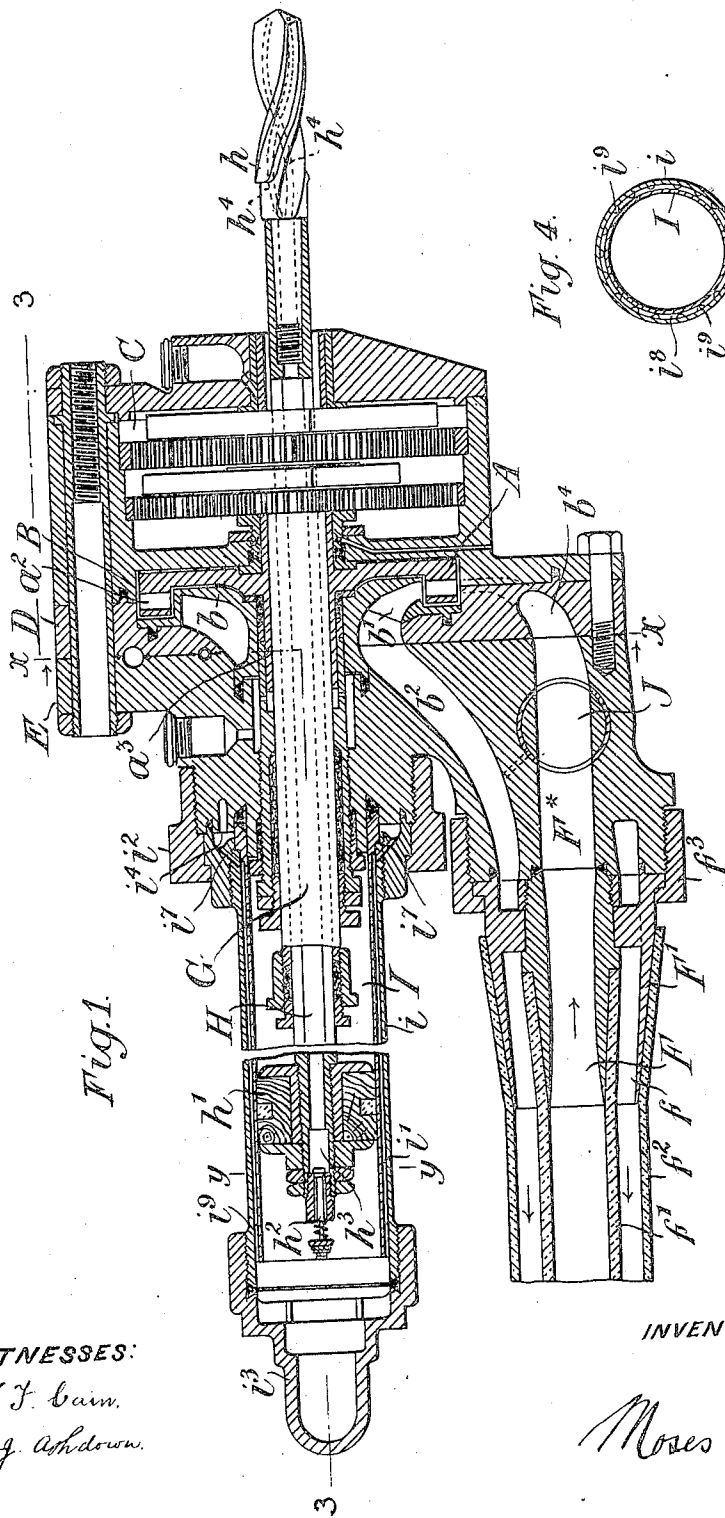
No. 890,065.

PATENTED JUNE 9, 1908.

M. KELLOW.
ROCK DRILL.

APPLICATION FILED APR. 1, 1907.

3 SHEETS—SHEET 1.



WITNESSES:
W. F. Gair.
C. J. Ashdown.

INVENTOR:

Moses Kellow

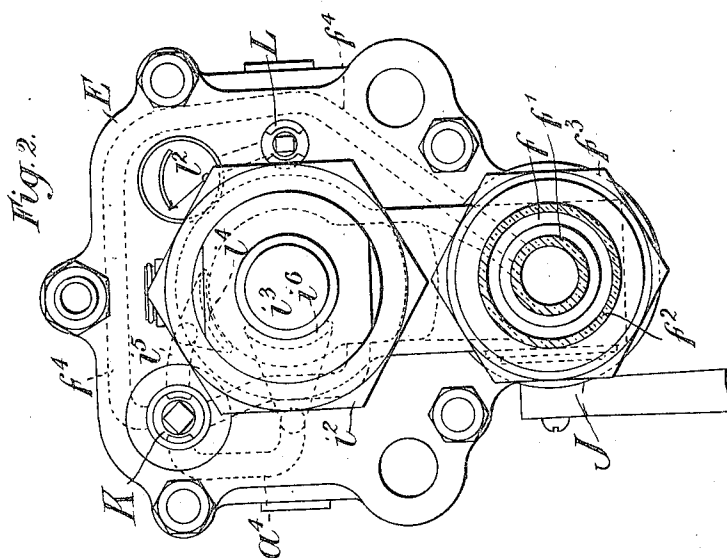
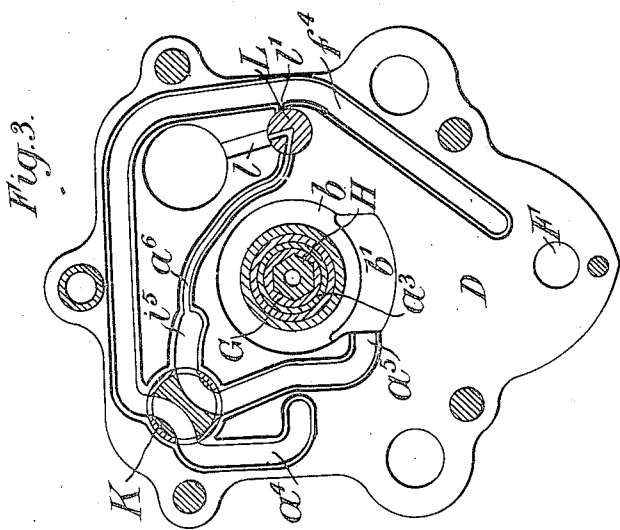
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3 SHEETS—SHEET 2.



WITNESSES:

H. T. Bain.
C. J. Ashdown.

INVENTOR:

Moses Kellow

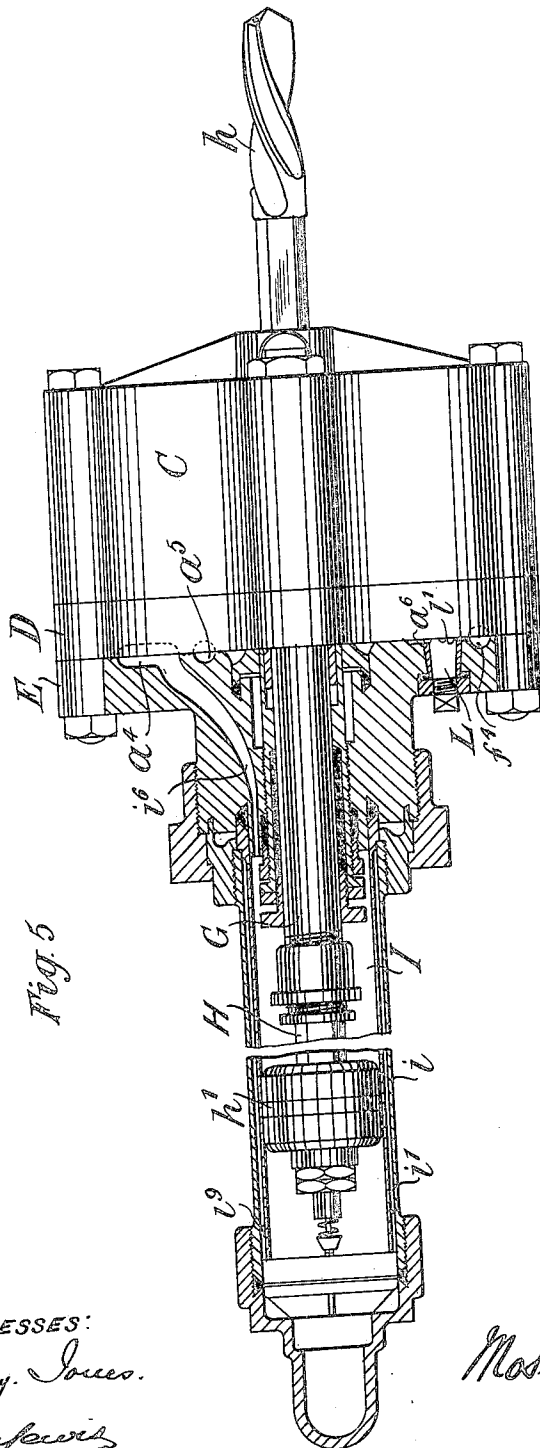
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3 SHEETS—SHEET 3.



WITNESSES:
Harry Jones.
Eugene

INVENTOR:

Moses Kellow

UNITED STATES PATENT OFFICE.

MOSES KELLOW, OF PENRHYNDENDRAETH, ENGLAND.

ROCK-DRILL.

No. 890,065.

Specification of Letters Patent.

Patented June 9, 1908.

Original application filed November 9, 1906, Serial No. 342,686. Divided and this application filed April 1, 1907.
Serial No. 365,798.

To all whom it may concern:

Be it known that I, MOSES KELLOW, of the Park and Croesor Quarries, Penrhyndendraeth, in the county of Merioneth, North Wales, a subject of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Power-Driven Rock-Drills, of which the following is a specification.

10 This invention, a division of my application filed 9th November, 1906, Ser. No. 342686, relates to rock-drills of the type wherein a turbine or other small motor, is employed for rotating the drill.

15 The present invention consists in certain improvements in power drills of this class, particularly in the construction and mounting of the turbine-wheel, in the means for feeding forward and withdrawing the drill, 20 and in the construction of the casing.

In the accompanying drawings, which illustrate a turbine-driven rock-drill embodying my improvements, Figure 1 is a longitudinal section of the machine, Fig. 2 a view of the rear end thereof, and Fig. 3 a vertical section, looking in the direction of the arrows on the line $x-x$ in Fig. 1, showing the water-passages for supplying water to the opposite sides of the piston in the piston cylinder, and 25 Fig. 4 is a vertical section, taken on the line $y-y$ in Fig. 1, showing the passages between the two concentric cylinders and Fig. 5 a section on the line $z-z$ in Fig. 1.

According to my improved method of construction, the turbine-wheel A is housed in a 35 chamber B formed as to one side by the wall of the gear-chamber C and as to the other side by a cover b attached to a plate D which is placed between the gear-case C and a rear-plate E, the latter carrying the main water-supply-nozzle F hereinafter described. The 40 turbine A is housed within its chamber B with just sufficient clearance to permit of its free working; and the water, after impinging upon the vanes a^2 , plows through a passage b^1 45 formed in the cover b of the wheel-chamber, and thence into the discharge-passage b^2 in the casing.

The turbine A is mounted on or formed 50 with a sleeve a^3 adapted to rotate freely upon a casing G which partially incloses a drill-tube H of hexagonal form throughout its length and capable of withdrawal through the back of the machine. This tube is furnished at its outer extremity with a drill h , 55

while its inner extremity is furnished with a piston h' , preferably of hard wood, which works in a cylinder I arranged concentrically within an outer cylinder i : the latter forming an annular passage i' around the inner cylinder. The exterior face of the inner cylinder is formed with a series of collars i^3 disposed at intervals along its length and which fit closely within the outer cylinder to support and stiffen the latter, channels i^9 being 60 formed for the passage of the water, as shown in Fig. 4. With the aid of a suitable flange and a nut i^2 these cylinders are attached at their one end to the rear-plate E of the casing, while their opposite ends are closed by a suitably formed cap i^3 . By 70 means of the nut i^2 the cylinders are readily detached from the casing for the insertion of drill-tubes of varying lengths, according to the depth of the hole required. Water under 75 pressure is admitted by way of the passage f^4 and the cock K to the annular passage i' between the cylinders or to the interior of the cylinder I, according to whether it is desired to advance or to withdraw the drill. 80 For withdrawing the drill the cock K is placed in the position shown in Fig. 3, communication being effected between the passages f^4 and a^4 , and between the passages a^5 and i^5 . In this position of the cock the water 85 flows from the passage a^4 to a passage i^6 in the face of the rear-plate E and thence passes into the cylinder I at the front of the piston h' . When it is desired to advance the drill the cock K is turned so that the passage f^4 90 is placed in communication with the passage i^5 , and the passage a^4 in communication with the passage a^5 ; water will now flow from the passage i^5 into a passage i^4 in the face of the rear-plate and thence by way of passages i^7 95 and the annular passage i' to the rear of the piston h' .

At the piston-end of the drill-tube H is mounted a spring-supported valve h^2 adapted to admit water to an axial passage h^3 in the 100 drill-tube, whence it passes by way of passages h^4 in the drill to the extremity of the latter. The spring pertaining to the valve h^2 is adjusted to permit of the latter opening at the pressure required for advancing the 105 drill when boring; the said valve closing and shutting off the water supply to the drill when the latter is not working.

For supplying water to the casing to operate the drill and for subsequently discharg- 110

ing the same, I employ two concentric nozzles F F' attached to the rear-plate E. The inner nozzle F serves to convey the water to the casing, while the outer nozzle F', which forms an annular passage f about the inner nozzle, serves as the outlet from the casing. To these nozzles hose-pipes f' f'' are respectively connected for the supply and discharge of the water; the nozzles being connected together by means of concentric unions capable of being tightened by a single nut f^3 .

The supply of water to drive the turbine is controlled, independently of the supply which passes to the drill-piston, by means of a plug-cock J arranged in the inlet-passage F* in the rear-plate E, and adapted to open or close communication between the passage F* and a passage b^4 which serves as a nozzle through which the water passes to drive the turbine.

The passages for conveying the water to and from the four-way cock are formed in the castings from which the casing is built up; the passages being by preference formed in the faces of contiguous castings, so that when these are jointed together, complete passages are formed. Passages l l' also communicate through the intervention of a cock L between the main-supply-passage f^4 and a pressure-gage l^2 which is inclosed within the casing and serves to indicate the pressure of the water in the passage f^4 . The pressure of the water acting on the piston h' may also be indicated by placing the passage l in communication with the passage a^5 .

What I claim as my invention and desire to secure by Letters Patent; is:—

1. In a rotary rock-drill the combination, with a drill tube, a piston mounted at the rear extremity of said tube and a turbine wheel for rotating said tube, of a casing inclosing said turbine, two cylinders mounted concentrically at the rear of said casing so as

to form an annular passage, passages formed in said casing and communicating respectively with the annular passage and with the interior of the inner cylinder and a cock whereby pressure water is admitted to one or the other passage according to whether it is desired to feed forward the drill or withdraw the same.

2. In a rotary rock-drill, the combination, with a turbine, gearing driven by said turbine and a drill-tube casing rotated by said gearing, of a drill-tube formed with an angular peripheral surface and housed within said casing, a piston at the rear extremity of said drill-tube, and a machine casing comprising a front part forming the gear case, an intermediate part forming with the gear case a turbine chamber, and a rear part formed with main supply and discharge passages and with passages for conveying water to the rear and to the front of said drill-tube piston.

3. In a rotary rock-drill, the combination, with a turbine, gearing driven by said turbine and a drill-tube casing rotated by said gearing, of a drill-tube formed with an angular peripheral surface and housed within said casing, a piston at the rear extremity of said drill-tube, a spring-controlled-valve mounted in said piston, and a machine casing comprising a front part forming the gear case, an intermediate part forming with the gear case a turbine chamber, and a rear part formed with main supply and discharge passages and with passages for conveying water to the rear and to the front of said drill-tube piston.

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

MOSES KELLOW.

Witnesses:

ALFRED NUTTING,
G. P. PHILLIPPS.