

E. M. MACKIE & P. F. DOYLE.

ROCK DRILL.

APPLICATION FILED APR. 14, 1910.

1,042,359.

Patented Oct. 22, 1912.

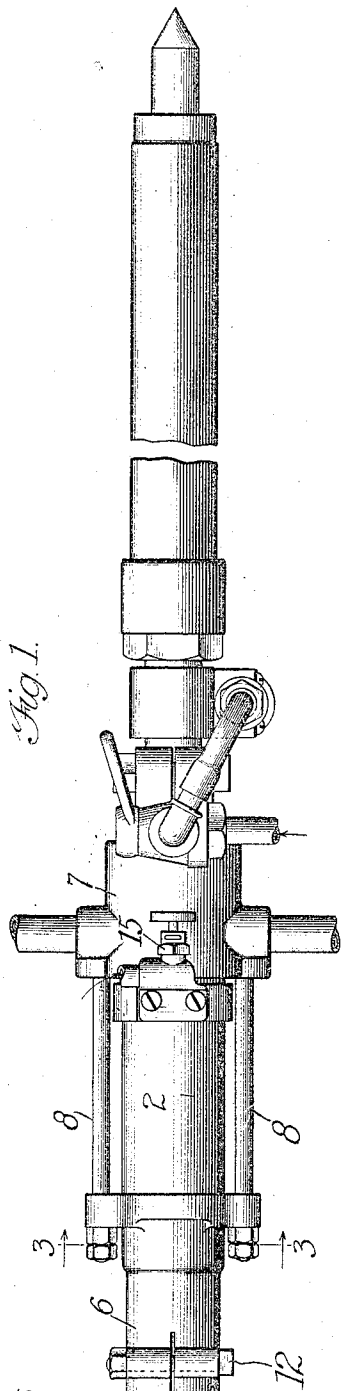


Fig. 1.

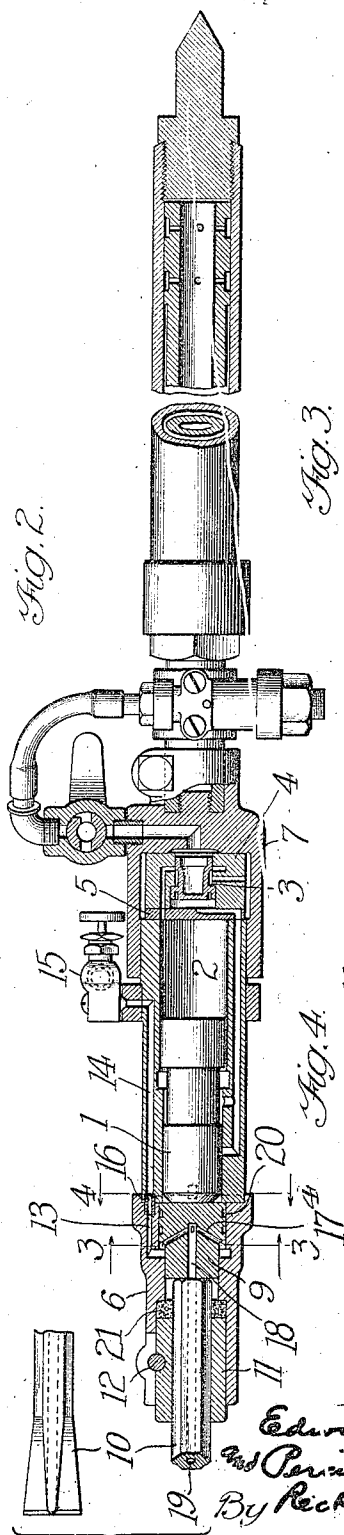


Fig. 2.

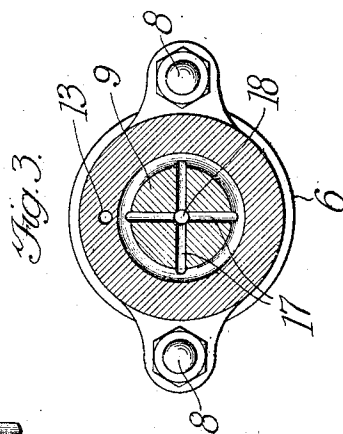


Fig. 3.

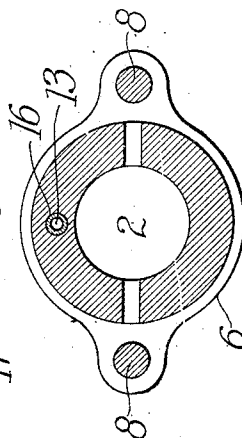


Fig. 4.

Witnesses
Louis B. Erwin
Robert H. Dolbeman

Inventors
Edwin M. Mackie
and Percival F. Doyle
By Rector, Hibben & Davis
Their Attys

UNITED STATES PATENT OFFICE.

EDWIN M. MACKIE, OF CHICAGO, ILLINOIS, AND PERCIVAL F. DOYLE, OF FRANKLIN, PENNSYLVANIA, ASSIGNORS TO CHICAGO PNEUMATIC TOOL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF NEW JERSEY.

ROCK-DRILL.

1,042,359.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Original application filed January 19, 1909, Serial No. 473,149. Divided and this application filed April 14, 1910. Serial No. 555,348.

To all whom it may concern:

Be it known that we, EDWIN M. MACKIE, a citizen of the United States, formerly residing at Franklin, Venango county, Pennsylvania, but now residing at Chicago, Cook county, Illinois, and PERCIVAL F. DOYLE, a citizen of the Dominion of Canada, residing at said Franklin, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification forming part of an application divisional of an original application filed on January 19, 1909, Serial No. 473,149, for improvements in rock-drills.

Our invention relates to rock drills, more particularly those of the type known as hammer drills and the object thereof is, in general, to improve the construction and operation of such drill.

The particular object of our invention is to provide novel and efficient means for supplying water, or water and air, to the striking piece and also to the drill steel, so that the water or the air and water may be forced through such drill steel and out of the same at its cutting end to thoroughly clean the hole of cuttings, thus enabling the machine to drill faster and to keep the cutting end of the drill steel cool in order that it may retain its temper. Furthermore, such supplying of water, or water and air, will prevent sticking of the steels and will also prevent dust from the drilling mixing with the atmosphere which the operators have to breathe and will consequently protect them from contracting what is known as miner's phthisis.

Other novel and advantageous features of construction and operation will be apparent from the description hereinafter given.

In the drawing Figure 1 is a plan view of our improved rock drill with our invention embodied therein; Fig. 2 a section thereof partly in elevation; and Figs. 3 and 4 cross-sections on the sectional lines 3-3 and 4-4 respectively of Fig. 2.

Referring to the present embodiment of our invention, the elements of the hammer are of the usual construction, so that it will be sufficient to refer to them in general terms only. As shown in Fig. 2, the hammering piston 1 reciprocates in the cylinder

2, to which the fluid pressure is admitted and released by means of the valve 3 working in coöperation with the piston 1, with the result that the piston will be reciprocated in opposite directions and caused to deliver its blow on its forward stroke. As shown the valve is adapted to operate in a suitable valve box or bushing 4 whose front end is closed from the cylinder or piston chamber by means of the valve box cap 5.

The drill is in the present instance provided with a front head 6 secured to the cylinder preferably by a slip joint, to which end this head is suitably machined on its upper end to form a cap for the lower end of the drill cylinder. This front head, as well as the back head 7 which also has a slip joint connection with the cylinder, is rigidly held in position by means of the tie rods or bolts 8 which serve to clamp such heads to each other and to the interposed cylinder. The interior of the upper end of the lower or front head is provided with a two diameter bore in order to receive the striking piece 9 which is of corresponding two diameters. This striking piece is arranged to receive the blow of the hammering piston 1 and to transmit the same to the inner end of the drill steel 10 which is inserted in the front end of the front head 6 and received by the chuck bushing 11. In order to facilitate the removal of the chuck bushing the front head is slotted, as seen in Figs. 1 and 2 and provided with a clamping bolt 12 for clamping such head upon the bushing. This clamping bolt is adapted to lie in a depression formed on one side of the bushing, so as to prevent the latter from rotating. This front head forms a water head and to this end the same is provided with a water supply passage 13 arranged to communicate with a water supply passage 14 extending longitudinally of the drill cylinder, the same being connected to any suitable source of water or both air and water controlled by suitable valve mechanism 15. In order to provide for a proper connection between the passages 13 and 14 and also to locate or determine the proper relative position of the front head and the cylinder, we provide a hollow dowel 16 located at the joint

between the front head and cylinder. The water passage 13 communicates with the bore of the front head at the shoulder formed between the two diameters of the bore and the water so admitted is adapted to flow through radial passages 17 in the striking piece 9, which passages communicate with a common central passage 18. This passage in turn is arranged to communicate with a central passage 19 in the drill steel. In order to prevent leakage of the fluid around the striking piece the same is provided with suitable packing 20, preferably leather, and likewise for the same purpose the drill steel is provided with suitable packing 21 arranged behind the chuck bushing 11 and around the inner end of the drill steel. Under this construction and arrangement the water or air and water mixed may be admitted through the passages 13 and 14, thence through the passages 17 and 18 in the striking piece, and finally through the passage 19 in the drill steel to the cutting end of the latter, thereby obtaining in a novel and simple manner the advantages recited in the preamble of this specification.

We do not herein claim the feature of the air feed device and the feature of the slip joint connections for the convenient dismantling or assembling of the machine in-

asmuch as the same forms the subject matter of the original application, of which the within application is divisional.

We claim:

In a rock drill, the combination, with a hammer barrel or cylinder and its piston and valve, of a front head secured to the cylinder and adapted to receive the working tool, and a striking piece located in said head and having water passages, one of which is adapted to communicate with a water passage in the working tool, said front head having a water supply passage to supply water to the passages in the striking piece and the cylinder having a corresponding water passage, and a hollow dowel for connecting the water passages at the junction between the cylinder and front head and for determining the proper relative position of such parts.

EDWIN M. MACKIE.

PERCIVAL F. DOYLE.

Witnesses to the signature of Edwin M. Mackie:

B. E. ANDERSON,

LOUIS B. ERWIN.

Witnesses to the signature of Percival F. Doyle:

L. F. HOFFMAN,

ELMER A. LAWRENCE.

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