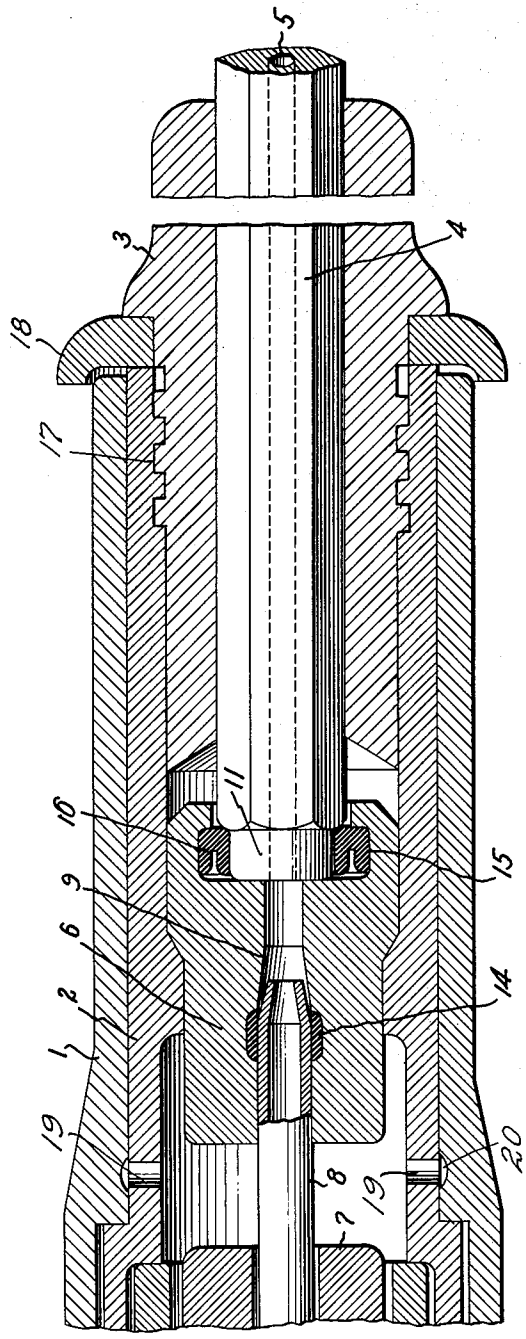
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SEALING DEVICE FOR ROCK DRILLING MACHINES

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INVENTOR:

Bengt Erik Ragnwald Löfqvist,

BY

Pierce, Scheffler + Parker,

ATTORNEYS.

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SEALING DEVICE FOR ROCK DRILLING MACHINES

Bengt Erik Ragnwald Löfqvist, Sandviken, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

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The present invention relates to rock drilling machines and more particularly to hammer rock drilling machines provided with an anvil block and with a means for supplying liquid to the cutting points of the steels or bits used with such machines.

The invention has for its object to provide an improved sealing for preventing liquid such as water from leaking out into the machine. Especially when drilling long holes with the then necessary high liquid pressures at the inlet end of the drill considerable leakage occurs in the machine and may result in an insufficient quantity of liquid reaching the drill crown.

More specifically, an object is to provide a rock drill including a reciprocating piston and anvil for imparting hammer blows to a hollow drill bit, a water supply line or passage extending axially through the anvil and drill bit, and sealing rings at the opposite ends of the water passage through the anvil to prevent leakage.

These and other objects and the advantages of the invention will be apparent from the following specification when taken with the accompanying drawing in which the single view is a fragmentary longitudinal central section through a rock drill embodying the invention.

In the drawing, the reference numeral 1 identifies the rigid casing of the rock drill in which the sleeve 2 is rotatably mounted and carries the chuck 3 for receiving a drill bit 4 having an axial bore 5 therethrough. An anvil 6 is slidably mounted in the sleeve 2 and has a flat or radially extending inner end for engagement by the correspondingly shaped outer stem end 7 of a reciprocating piston. A water supply tube 8 extends axially through the piston and into the axial bore 9 of the anvil 6. A cylindrical packing ring 14 of rubber or other elastic material is provided in a circumferential recess in the anvil 6 to seat against the water supply tube 8 and prevent leakage between the water supply tube and the anvil.

The inner end 11 of the hexagonal drill rod 4 is cylindrical and seated within an undercut recess 15 in the outer end of the anvil 6. A sealing ring or packing 16 of rubber or other elastic material, preferably nonmetallic and of U-shape in radial cross-section, is arranged in the recess 15 to press against the circumferential wall of the recess and the cylindrical surface of the end 11 of the drill bit. The bore 5 of the drill bit alines with the bore 9 of the anvil, and the packing 16 prevents leakage of water at this junction. It is not essential that the inner end 11 of the drill bit be of cylindrical form as the inner surface of the packing 16 may be appropriately shaped to seat against a drill bit end of other configuration. It is deemed preferable, however, for convenience in manufacture of the packing ring 16 with an

inner cylindrical surface, to provide a cylindrical inner end 11 on the drill bit.

The reduced diameter cylindrical end 11 of the drill bit 4 is of substantially the same axial length as the undercut or radially enlarged recess 15 in which the packing ring 16 is seated, and the radial shoulder between the main body of the drill bit and the reduced diameter end 11 is located within the entrance to the undercut recess 15 to retain the sealing ring 16 within the recess 15 and to constitute a backing for the sealing ring. The sealing ring 16 is elastic or somewhat yielding under the pressure of the water, and is thus pressed into good sealing contact with the anvil and the drill but but can not be forced out of its sealing position by the water pressure.

The chuck 3 may be mechanically interlocked with the sleeve 2 by any convenient means, for example the illustrated threaded connection 17, and the chuck 3 may be provided with an annular flange 18 for convenience in inserting and threading the chuck into the sleeve. The space between the piston 7 and the anvil 8 is vented to atmosphere through radial ports 19 which extend through the sleeve 2 to open into a circumferential recess 20 in the casing 1, the recess in turn being open to the atmosphere through a port, not shown. It is to be understood that many modifications and changes may be made in the embodiment shown and described.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a rock drill, a chuck for receiving a drill bit provided with a reduced diameter cylindrical inner end and having an axial bore therethrough, a reciprocating piston and anvil for imparting hammer blows to a drill bit seated in said chuck, said anvil having an axial bore therethrough and an undercut recess adjacent and spaced axially from the outer end thereof, a water supply tube extending through said piston and into the bore of said anvil, a packing of elastic material between said water supply tube and said anvil, and means resiliently coupling said anvil to and centering the same with respect to a drill bit inserted in said chuck, said coupling means comprising an annular elastic packing seated in said undercut recess of said anvil and compressed radially by the insertion therein of the inner cylindrical end of a drill bit inserted into said chuck, thereby to seal the joint between the bore of said anvil and the bore of said drill bit, the axial length of the undercut recess being substantially equal to the axial length of the cylindrical reduced diameter inner end of the drill bit, whereby the shoulder between the reduced diameter portion of the drill bit and the main body thereof will be located within the entrance to said undercut recess to constitute a backing for said second packing.

2. In a rock drill, the invention as recited in claim 1, wherein the packing in the undercut recess of the anvil is of U-shape in radial cross-section and with the solid base of the packing outwardly directed.

References Cited in the file of this patent

UNITED STATES PATENTS

816,090	Hellman et al.	Mar. 27, 1906
1,080,095	Bayles	Dec. 2, 1913
1,450,208	Hanson et al.	Apr. 3, 1923
1,657,317	Potter	Jan. 24, 1928

FOREIGN PATENTS

522,765	Great Britain	June 26, 1940