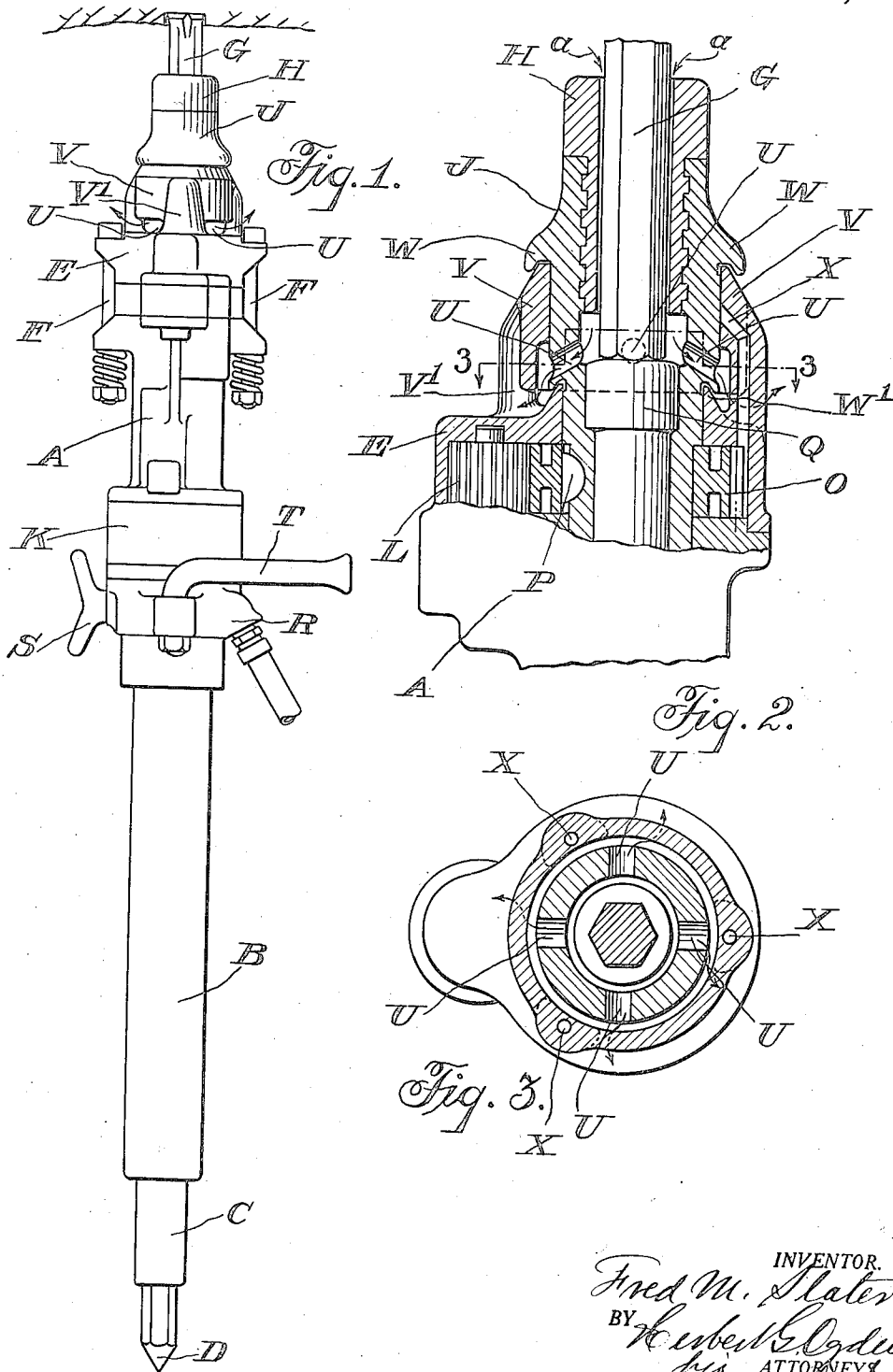


F. M. SLATER.
 FRONT END CONSTRUCTION FOR ROTATING ROCK DRILLS.
 APPLICATION FILED MAR. 22, 1920.

1,407,589.

Patented Feb. 21, 1922.



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FRONT-END CONSTRUCTION FOR ROTATING ROCK DRILLS.

1,407,589.

Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed March 22, 1920. Serial No. 367,832.

To all whom it may concern:

Be it known that I, FRED M. SLATER, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Front-End Construction for Rotating Rock Drills, of which the following is a specification.

This invention relates to rotating drills of the fluid actuated percussive type but more particularly to the construction of the front end of such a drill especially useful for stope drills running wet, that is, with water for cleaning out the hole.

In drilling an up-hole or overhead hole for instance, with any drill, the water running down out of the hole enters between the drill steel and the rotation sleeve or chuck and is apt to carry dirt and particles of material into the operative parts of the drill thus clogging the operation and causing excessive wear and possibly breakage.

The primary object of the present invention is to afford means for protecting the operative parts of the drill as far as possible from the injurious effects of the water and dirt, and to these ends the invention consists of the construction illustrated in one of its preferred forms in the accompanying drawings in which—

Figure 1 is a side elevation of a tool embodying the invention,

Figure 2 is an enlarged detail elevation of the front head of the tool partly broken away and partly in longitudinal section, and

Figure 3 is a transverse sectional view on the line 3—3 of Figure 2.

Referring to the drawings, A represents a cylinder casing or drill casing of a stope drill of the percussive type having the usual air feed cylinder B, air feed cylinder piston C and foot D. The front head E is clamped to the cylinder casing A by the spring pressed side bolts F and the drill steel or bit G in this instance, is held in the chuck bushing H mounted in the chuck J which is connected to be rotated by a suitable rotation motor preferably located in the motor casing K. A portion of the motor rotation train of gearing is shown in Figure 2 within the front head E, the pinion L meshing with the gear O keyed to the chuck J as by means of the key P. An anvil block

Q is also shown in Figure 2 as a preferable construction.

Fluid pressure is admitted to the tool through the inlet R and distributed to the hammer cylinder casing A and the air feed cylinder B by the usual throttle valve S. A handle T may be provided to be grasped by the operator.

Dirt and water enter the tool around the drill steel at the points indicated by the arrows *a* in Figure 2, but in accordance with this invention, a plurality of exits U for such water and foreign matter are provided in the chuck J at points located at the base of the shank of the drill steel G, and the front head E is formed with a forwardly extending shroud V separate from the chuck J, and supported on arms V'. The shroud V partially covers the exits or orifices U and serves to protect the operator from the issuing dirt and water by deflecting the issuing stream and reducing the velocity. The shroud V preferably extends somewhat below the exits or orifices U so that the dirt and water have indirect or tortuous passages of increasing capacity or size from the interior to the exterior of the tool and the muddy cleaning fluid is thus prevented from being thrown outward in the form of spray. With my improved construction, the tendency of the fluid entering the tool around the drill steel at *a* will be to pass out at the orifices U in the whirling or rotating chuck J, rather than to pass downwardly into the operative parts of the tool.

As a further means of protecting the tool, the chuck J is provided with an overhanging flange W which protects the joint forming a circular bearing between the front head E at the shroud V and the chuck J and with a similar joint W' below the point at which the orifices U issue, forming a second bearing. The bearing between the shroud V of the front head E and the rotating chuck J is further lubricated and kept clean by means of the passages X which, as shown, extend from a position adjacent the rotation gears L and O, through the supports V'' and shroud V of the front head E, to the bearing and joint referred to, and these passages permit motive fluid under reduced pressure carrying lubricant to pass to the forward extremity of said bearing and joint, thus tending to keep dirt and water out of

the bearing and out of the joint between the chuck J and the shroud V of the front head E.

I claim—

- 5 1. In a front end construction for rock drills, the combination of a chuck for holding the drill steel and means for rotating the chuck, said chuck being provided with apertures located at points opposite the
10 base of the drill steel shank for permitting water and extraneous matter to escape to the exterior of the drill casing without entering the operative parts of the tool, a shroud for said apertures, forming an in-
15 tegral part of the front end of the rock drill, and a circular bearing between the shroud and the chuck.
2. In a front end construction for rock drills, the combination of a chuck for hold-
20 ing the drill steel, means for rotating the chuck, said chuck being provided with apertures located at points opposite the base of the drill steel shank for permitting water and extraneous matter to escape to the exte-
25 rior of the drill casing without entering the operative parts of the tool, a protective shroud forming an integral part of the front head arranged opposite the said apertures, and a circular bearing between the shroud
30 and said chuck.
3. In a front end construction for rock drills, the combination of a rotating chuck for holding the drill steel, and means for
35 supplying motive fluid under reduced pressure to the bearing between the chuck and front head near the forward extremity of the bearing to keep said bearing free from dirt and other extraneous matter.
4. In a front end construction for rock
40 drills, the combination of a rotating chuck for holding the drill steel, and means for supplying motive fluid under reduced pressure carrying lubricant to the bearing be-
45 tween the chuck and front head near the forward extremity of the bearing to keep said bearing free from dirt and other extraneous matter.
5. In a front end construction for rock
50 drills, the combination of a front head, a rotating chuck for holding the drill steel, said chuck being provided with apertures located at points opposite the base of the drill steel shank for permitting water and
55 of the drill casing without entering the operative parts of the tool, a circular bearing for the chuck carried by the front head

and located forwardly of said apertures, and means for supplying motive fluid under pressure to the bore of said bearing at a point forward of said apertures to keep said bearing clean.

6. In a front end construction for rock drills, the combination of a rotating chuck for holding the drill steel, said chuck being
65 provided with exit apertures, a front head in which said chuck is free to rotate, a bearing on the front head for said chuck located rearwardly of the apertures, and a circular bearing for the chuck carried by the front
70 head and located forwardly of said apertures.

7. In a front end construction for rock drills, the combination of a rotating chuck for holding the drill steel, said chuck being
75 provided with exit apertures, a front head in which said chuck is free to rotate, bearings between said chuck and front head both rearwardly and forwardly of said apertures, a shroud on said front head, forming a bear-
80 ing for the chuck, and passages for supplying motive fluid and lubricant to the bore of the bearing between the chuck and shroud at a point forward of said apertures.

8. In a front end construction for rock
85 drills, the combination of a chuck for holding the drill steel and means for rotating the chuck, said chuck being provided with apertures located at points opposite the base of the drill steel shank for permitting water
90 and extraneous matter to escape to the exterior of the drill casing without entering the operative parts of the tool, supports forming an integral part of the front end of the rock drill and extending forwardly past
95 said apertures and a circular bearing between the forward portions of said supports and the chuck.

9. In a front end construction for rock drills, the combination of a front head, a
100 rotating chuck for holding the drill steel, apertures in the wall of the chuck for permitting water and extraneous matter to escape to the exterior of the chuck, forwardly extending supports on the front head, a
105 circular bearing for the chuck at the forward portions of the supports, and means for supplying motive fluid under pressure to the bore of said circular bearing to keep
110 said bearing clean.

In testimony whereof, I have hereunto set my hand.

FRED M. SLATER.