Dec. 28, 1926. 1,612,783

E. G. GARTIN

ROCK DRILLING MECHANISM

Filed Oct. 18, 1923

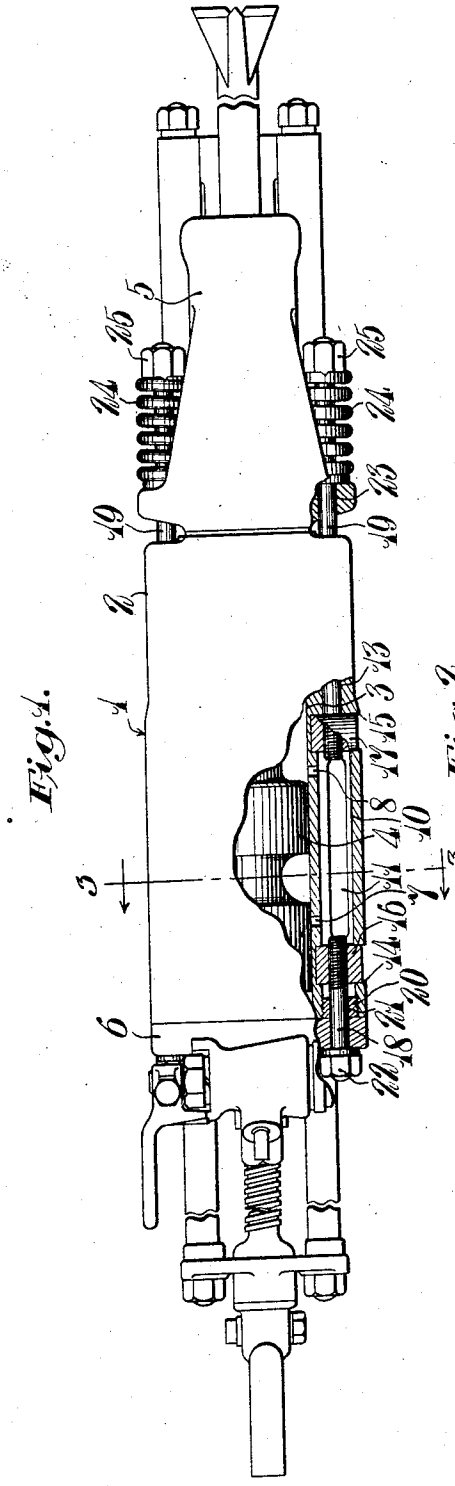


Fig. 1.

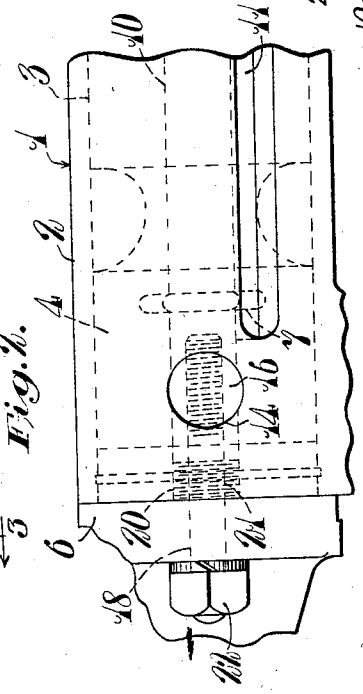


Fig. 2.

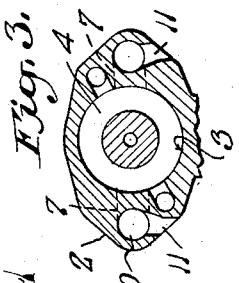


Fig. 3.

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UNITED STATES PATENT OFFICE.

ELMER G. GARTIN, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

ROCK-DRILLING MECHANISM.

Application filed October 18, 1923. Serial No. 669,421.

My invention relates to rock drilling mechanisms, and particularly to rock drilling mechanisms of the type in which the drilling motor comprises piston controlled exhaust means.

An object of my invention is to provide an improved rock drilling mechanism. Another object of my invention is to provide an improved rock drilling mechanism of the type in which exhaust means controlled by the movements of the piston is provided. A further object of my invention is to provide an improved rock drilling mechanism of the type in which the motor comprises a cylinder having exhaust ports extending from the bore thereof and controlled by the movements of the piston and in which improved means for assembling the parts of the motor are also provided. Other objects and advantages of my invention will hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a view mainly in plan, but with parts broken away to show details of construction.

Fig. 2 is a fragmentary view at right angles to Fig. 1 and on an enlarged scale.

Fig. 3 is a view taken on the line 3—3 of Fig. 1.

In the illustrative form of my invention the same is embodied in a rock drilling motor of the percussive type generally indicated by 1 and comprising a cylinder member 2 in which a bore 3 is formed within which a piston 4 is reciprocable. The front end of the cylinder bore is closed by a combined chuck housing and front head member 5, while the rear end is closed by a rear head 6. Fluid is distributed to the opposite ends of the cylinder bore 3 by means of any suitable fluid distribution mechanism, not shown herein, but which may take the form shown in the application of Charles H. Allen, Ser. No. 362,272, filed March 1, 1920. Exhaust from the cylinder in the illustrative form shown takes place through exhaust ports 7 and 8 which are respectively controlled by the rear end and the front end of the piston 4. These ports, which are duplicated at the other side of the motor, open into a bore 10 which in the construction of the motor is drilled from one end of the cylinder member, herein the rear end thereof, to a position forward of the front exhaust port 8. Slots are then milled as indicated at 11 through the member 2 to open into the chambers 10, these slots being of substantial length and width so as to provide a very free exhaust and are so positioned as to deflect the flow of exhaust fluid downwardly. It will be observed that a hole 13 is drilled in alinement with the bore 10 throughout the remaining portion of the length of the cylinder member 2. Furthermore there are cut by milling or boring, herein the latter, at right angles to the passages 10 and 13 recesses or openings in the cylinder member 2, which are designated respectively 14 and 15. Into these slots or openings there are slipped nuts 16 and 17 respectively, which are herein cylindrical to fit the circular holes 14 and 15, with which nuts studs or rods 18 and 19 cooperate in the holding of the heads 6 and 5 in position upon the cylinder. It will be observed that the rear ends of the bores 10 are provided with screw plugs 20 for the purpose of closing the same and more particularly serving to center, by means of holes of smaller diameter 21 therein, the studs 18. Nuts 22 cooperate with the studs or side rods 18 to secure the rear head 6 in position. The studs or rods 19 which are materially longer than the studs 18 extend through openings 23 in the member 5 and are then surrounded by springs 24 upon which nuts 25 act to resiliently but firmly hold the front head 5 in position.

As a result of the construction described, it will be apparent that it is possible to secure a drilling motor whose over-all dimensions are no larger than the dimensions of a similar motor which is now well known and in which side rods extend for the full distance between the nuts 22 and 25 through the chamber 10 and bore 13, but that in the improved construction there is provided a materially freer exhaust than is secured if a portion of the bores 10 is obstructed by any type of rod. It is believed that the mode of operation of this mechanism is clearly apparent and that other than to state that the nuts 17 and 25, and 16 and 22 cooperate with the rods 19 and studs 18 in holding the parts

properly assembled, and that the unobstructed chamber 10 provides a clear and adequate exhaust conducting passage for the exhaust ports 7 and 8, no other description is necessary.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a rock drilling motor, a cylinder member, front and rear heads therefor, and means for maintaining the same in assembled relation comprising recesses formed in the sides of the cylinder member, said cylinder member having longitudinally extending exhaust chambers communicating with said recesses, nuts in said recesses, and means cooperating with said nuts for holding said heads on said cylinder.

2. In a rock drilling motor, a cylinder member, front and rear heads therefor, and means for maintaining the same in assembled relation comprising recesses formed in the sides of the cylinder member, said cylinder member having longitudinally extending exhaust chambers communicating with said recesses, nuts in said recesses, and means comprising members extending through said heads and threadedly engaging said nuts cooperating with said nuts to hold said heads on said cylinder.

3. In a rock drilling motor, a cylinder member, front and rear heads therefor, and means for maintaining the same in assembled relation comprising recesses milled in the sides of the cylinder member, said cylinder member provided with longitudinally extending exhaust chambers communicating with said recesses, nuts in said recesses, and means comprising rods threadedly engaging said nuts and nuts cooperating with the opposite ends of said rods for holding said heads in position upon said cylinder member.

4. In a rock drilling motor, a cylinder member, front and rear heads therefor, and means for maintaining the same in assembled relation comprising recesses milled in the sides of the cylinder member, said cylinder member having longitudinally extending exhaust chambers communicating with said recesses, nuts in said recesses, and means comprising rods threadedly engaging said nuts and nuts cooperating with the opposite ends of said rods for holding said heads in position upon said cylinder member, there being springs provided between said last mentioned nuts and the head which they hold in position.

5. In a motor, a cylinder member having a bore in which a piston is reciprocable, exhaust ports overrun and controlled by said piston, said cylinder having a chamber formed therein with which said exhaust ports communicate, a vent to the atmosphere from said chamber, cylinder heads, and means for holding said cylinder heads on said cylinder member including holding means in alinement with said chamber but not extending therethrough.

6. In a motor, a cylinder member having a bore in which a piston is reciprocable, exhaust ports overrun and controlled by said piston, said cylinder having a chamber formed therein with which said exhaust ports communicate, a vent to the atmosphere from said chamber, cylinder heads, and means for holding said cylinder heads on said cylinder member including holding means in alinement with said chamber but not extending therethrough, said holding means including nuts arranged at the ends of said chamber and holding means cooperating with said nuts and passing through said head members.

7. In a drilling motor, a cylinder member having a bore in which a piston is reciprocable, exhaust ports overrun and controlled by said piston, said cylinder having longitudinally extending chambers formed at each side thereof with which said exhaust ports communicate, a vent to the atmosphere so located in the lower side of each of said chambers as to permit the exhaust fluid to be deflected downwardly, cylinder heads, and means for holding said cylinder heads to said cylinder member including holding means disposed in alinement with said chambers and projecting therein but not extending therethrough.

8. In a drilling motor, a cylinder member having a bore in which a piston is reciprocable, exhaust ports overrun and controlled by said piston, said cylinder having longitudinally extending chambers formed at each side thereof with which said exhaust ports communicate, a vent to the atmosphere so located in the lower side of each of said chambers as to permit the exhaust fluid to be deflected downwardly, cylinder heads, and means for holding said cylinder heads to said cylinder member including separate holding means for each cylinder head disposed in alinement with said chambers at each end thereof and projecting therein but not extending therethrough.

In testimony whereof I affix my signature.

ELMER G. GARTIN.