Feb. 9, 1926. 1,572,647

E. G. GARTIN

FEED MECHANISM

Filed May 23, 1921

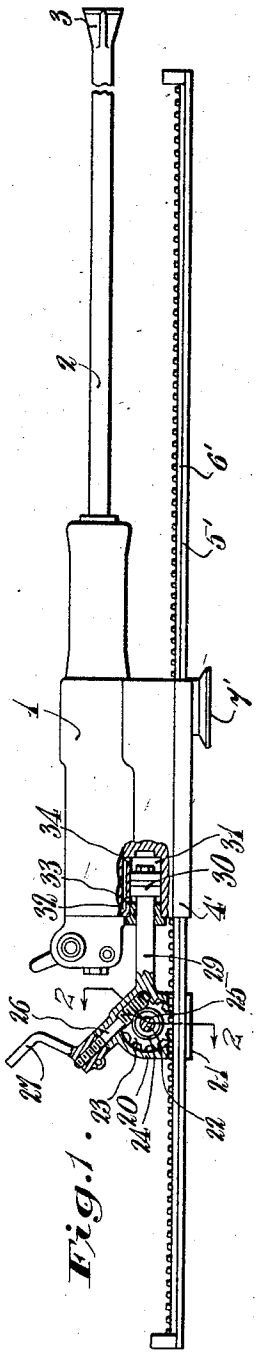


Fig. 1.

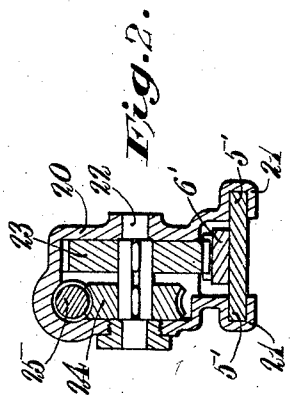


Fig. 2.

Inventor:
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by
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Patented Feb. 9, 1926. 1,572,647

UNITED STATES PATENT OFFICE.

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

FEED MECHANISM.

Application filed May 23, 1921. Serial No. 471,897.

To all whom it may concern:

Be it known that I, ELMER G. GARTIN, a citizen of the United States, residing at Claremont, in the county of Sullivan and State of New Hampshire, have invented certain new and useful Improvements in Feed Mechanisms, of which the following is a full, clear, and exact specification.

My invention relates to feed mechanisms and more particularly to feed mechanisms for rock drilling motors of the drifter type.

An object of my invention is to provide an improved feed mechanism. A further object of my invention is to provide an improved and very simple feed mechanism of a type adapted for use on rock drills of the class known as drifters and adapted to provide an extra long range of movement thereof. Still another object of my invention is to provide improved cushioning means between the drilling motor and the supporting member therefor. Other objects of my invention will appear in the course of the following specification and appended claims.

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 partially in elevation and partially in section of one illustrative embodiment of my invention in which it is shown in connection with a drifting drill.

Fig. 2 is a transverse section on the broken section line 2—2 of Fig. 1.

In this illustrative form of my invention, I have shown the same used in connection with a percussive motor 1 in which a piston, not shown, reciprocates in a well-known manner and imparts a rapid series of powerful blows to a drill steel 2, which drill steel is provide with a cutting end 3 adapted to operate upon rock in a well-known manner.

In my improved construction I have provided a rack and support member 6′, provided with guides 5′ projecting laterally from the sides thereof and mounted upon a trunnion 7′. The motor 1 is mounted in slidable relation upon the guides 5′, there being formed suitable grooved guides 4′ at the lower edge of the mounting thereof to cooperate with the guides 5′. For the purpose of feeding the motor forward, I provide a feeding mechanism comprising a housing member 20 having grooved guide members 21 engaging the guides 5′ and, engaging with a rack 6′ there is mounted upon a transverse shaft 22 a gear 23, which gear 23 is keyed to the shaft 22 and is driven by the latter. A worm wheel 24 is likewise keyed to the shaft 22 and is driven by a worm 25 which is in turn driven by a shaft 26 and a manual handle 27. For the purpose of providing a resilient and yet effective connection between the feeding mechanism and the drill member 1, I employ a pneumatic cushion device which comprises a forwardly extending piston rod 29 provided at its forward end with a piston 30, the latter being a close fit for a cylinder 31 formed in the lower portion of the mounting for the drill member 1. Fluid under pressure is conducted to opposite sides of the piston 30 by a passage 32 and ports 33 and 34. It will be obvious, by reason of the fact that a larger piston area is exposed at the forward side thereof, that the drill 1 will be normally kept in forward position with respect to the feeding mechanism, that is to say, that the piston 31 will occupy a rear position in the cylinder 30. When, however, drilling operation is in progress the re-action of the motor will be cushioned by the air in the forward end of the cylinder 30 and the motor will be free to move slightly with respect to the piston 31. It will be obvious that the steel may be forced up against the rock under the action of an air cushion in the cylinder 30 and that accordingly a considerable part of the vibration arising from the running of the motor and the hammering of its piston upon the drill steel will not be transmitted to the drill mounting and accordingly a smoother operating tool will be produced.

While I have in this application 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 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 drilling mechanism, an impact motor including a casing, a support on which said motor is movable, and fluid cushioning means between said motor casing and said support including a longitudinal bore in said

motor casing, a connecting arm extending forwardly into said bore, a member carried by said arm and slidably mounted in said bore, and means for admitting pressure fluid to said bore.

2. In a drilling mechanism, an impact motor including a casing, a support on which said motor is movable, and fluid cushioning means between said motor casing and said support including a longitudinal bore formed in the rear end of said motor casing, a longitudinally disposed connecting arm extending forwardly into said bore, a member carried by said arm and slidably mounted in said bore, and means for admitting pressure fluid to the opposite ends of said bore.

3. In a drilling mechanism, an impact motor having a casing, feeding means therefor, and fluid cushioning means between said motor and feeding means comprising a fluid chamber formed in the rear end of said motor casing, a longitudinally disposed arm connected to a portion of said feeding means and extending forwardly into said chamber, a piston secured to said rod and slidably mounted in said chamber, and means for admitting pressure fluid to said chamber.

4. In a drilling mechanism, an impact motor having a casing, feeding means therefor, and fluid cushioning means between said motor and feeding means comprising a fluid chamber formed in the rear end of said motor casing, a longitudinally disposed arm connected to a portion of said feeding means and extending forwardly into said chamber, a piston secured to said rod and slidably mounted in said chamber, and means for admitting pressure fluid to the opposite sides of said piston.

5. In a drilling mechanism, an impact motor having a casing, a guideway on which said motor is slidably mounted, means for feeding said motor longitudinally relative to said guideway, and fluid cushioning means between said motor and feeding means comprising a chamber formed in the rear end of said motor, a longitudinally disposed rod connected to a portion of said feeding means and extending forwardly into said chamber, a piston secured to said rod and slidably mounted in said chamber, and means for admitting pressure fluid to the opposite sides of said piston.

6. In a drilling mechanism, an impact motor having a casing, a guideway on which said motor is slidably mounted, means for feeding said motor longitudinally relative to said guideway including manually operable gear mechanism and a casing therefor, and fluid cushioning means between said motor and guideway including a fluid chamber formed in the rear end of said motor casing, a longitudinally disposed rod connected to said gear mechanism casing and extending forwardly into said chamber, a piston secured to said rod and slidably mounted in said chamber, and means for admitting pressure fluid to said chamber.

7. In a drilling mechanism, an impact motor having a casing, guides thereon, a guideway on which said motor is longitudinally movable, means for feeding said motor relative to said guideway including a manually operable gear mechanism including a casing therefor having guides cooperating with said guideway, and fluid cushioning means disposed between said motor and said gear mechanism including a cylinder formed in the rear end of said motor casing, a rod disposed substantially parallel to the path of movement of said motor and secured to said gear mechanism casing and projecting forwardly into said cylinder, a piston secured to said rod and slidably mounted in said cylinder, and means for admitting pressure fluid to the opposite ends of said cylinder.

8. In a drilling mechanism, an impact motor having a casing, a support on which said motor is movable, means for feeding said motor relative to said support including interengaging toothed members and a casing therefor, and fluid cushioning means disposed between said motor and said support including a longitudinal bore formed in said motor casing, a connecting arm secured to said second mentioned casing and extending forwardly into said bore, a piston secured to said arm and slidably mounted in said bore, and means for admitting pressure fluid to said bore.

In testimony whereof I affix my signature.

ELMER G. GARTIN.