Dec. 6, 1938. G. H. FUEHRER 2,138,915

ROCK DRILL

Filed March 2, 1937

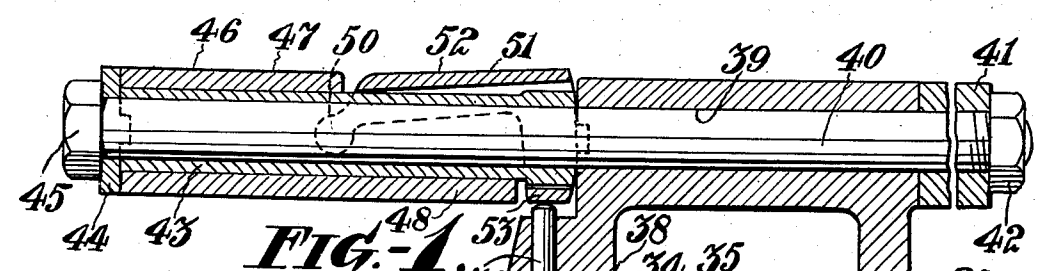


FIG.-1.

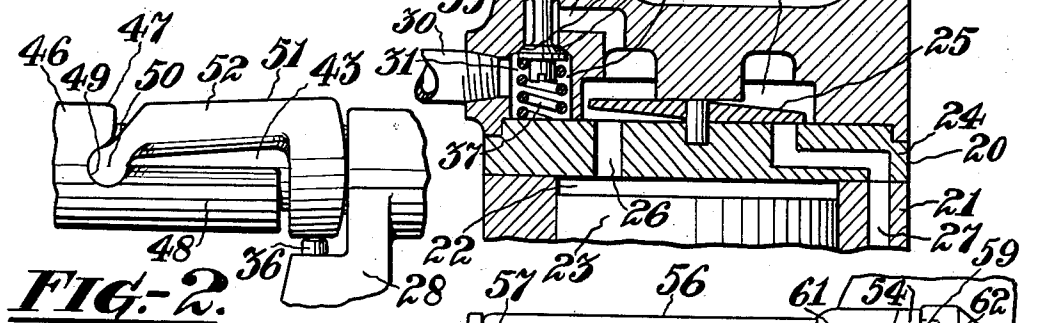


FIG.-2.

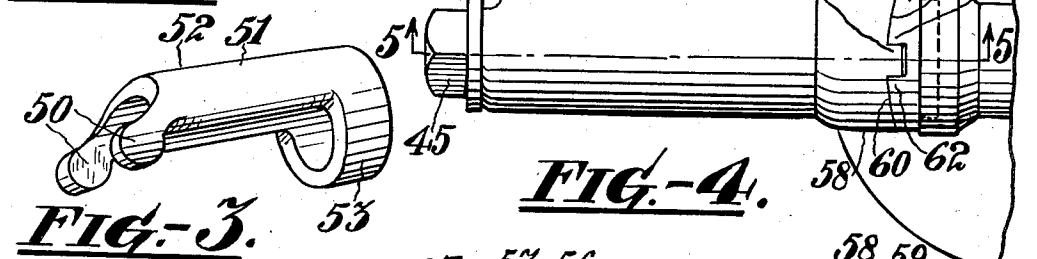


FIG.-3.

FIG.-4.

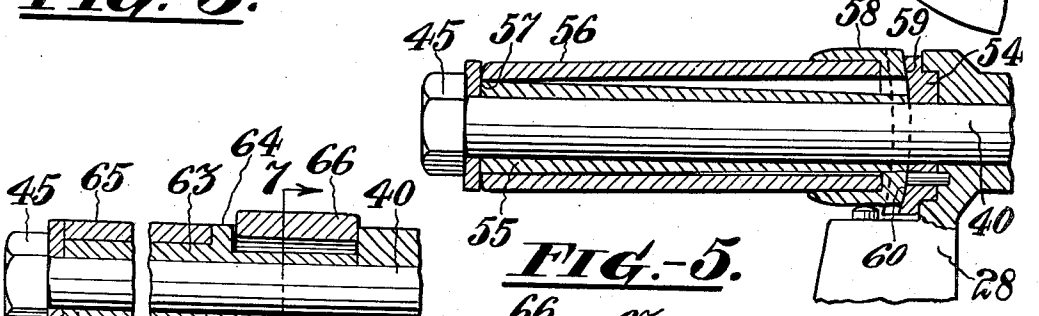


FIG.-5.

FIG.-6.

FIG.-7.

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ROCK DRILL

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7 Claims. (Cl. 121—35)

This invention relates to rock drills, and more particularly to a pressure fluid controlling device for fluid actuated rock drills of the hand held type.

One object of the invention is to enable the admission and cut-off of supply fluid to be readily affected by the pressure applied to the rock drill handle for bushing the rock drill toward or retracting it from the work.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, partly in section, of so much of a rock drill as will serve to illustrate the invention and a practical application thereof,

Figure 2 is a longitudinal side view of the controlling device shown in Figure 1,

Figure 3 is a perspective view of a detail,

Figure 4 is a plan view of a modified form of the invention,

Figure 5 is a longitudinal elevation, in section, taken through Figure 4 on the line 5—5,

Figure 6 is a longitudinal elevation, in section, of another modification of the invention, and

Figure 7 is a transverse view taken through Figure 6 on the line 7—7.

Referring to the drawing, and at first more particularly to the form of the invention illustrated in Figures 1 to 3 inclusive, 20 designates, in general, a rock drill of the hand held type comprising a cylinder 21 having a piston chamber 22 to accommodate a hammer piston 23.

A plate 24 forms a closure for the rear end of the piston chamber and also a seat for an oscillatory plate valve 25 which controls inlet passages 26 and 27 leading to the rear and front ends, respectively, of the piston chamber 22. The plate 24, moreover, serves as a seat for a back head 28 which may be secured to the cylinder 21 in any suitable manner and has a recess in its front end constituting a valve chamber 29 for the valve 25.

The pressure fluid employed for actuating the piston 23 is conveyed to the rock drill by a conduit 30 connected to the back head 28, and adjacent the juncture of the conduit with the back head is a bore 31 to receive the pressure fluid issuing from the conduit 30. The bore 31 comprises an enlarged portion 32 and a rearward reduced portion 33 which extends entirely through the back head. At the juncture of the portions 32 and 33 is a tapered seating surface 34 for a poppet type throttle valve 35 having a stem 36 which lies in the reduced portion 33 and extends exteriorly of the back head. The valve 35 is normally held upon the seat 34 by a spring 37.

Leading from the reduced portion 33 immediately rearwardly of the valve 35 is a supply passage 38 which opens into the valve chamber 29 for conveying pressure fluid thereto.

In the rear end of the back head 28 is a bore 39 to receive a rod or bolt 40 which extends beyond the opposite sides of the back head to serve as a handle for the rock drill. On one end of the bolt is a sleeve 41 which serves as a grip member and is clamped against the back head by a nut 42 threaded on the bolt 40. On the opposite end of the bolt 40 is a spacer 43 which seats with one end against the side of the back head, wherewith it is interlocked, and with its other end against a washer 44 interlocked with the sleeve 43 and seating against the head 45 of the bolt 40.

Encircling the sleeve 43, and preferably also interlocked with the washer 44, is a grip member 46 comprising a cylindrical portion 47 and a semi-cylindrical portion 48. The latter portion lies on the forward side of the handle, and at the juncture of the portions 47 and 48 and in opposite sides of the grip member 46 are bores providing bearing surfaces 49 for trunnions 50 carried by a movable grip member 51 adapted to actuate the throttle valve 35.

The grip member 51 comprises a partly cylindrical portion 52 corresponding substantially to and lying in the same transverse plane as the portion 48 although on the rearward side of the handle. The portion of the movable grip member 51 adjacent the back head is in the form of a sleeve 53 which encircles the handle and seats upon the end of the stem 36 of the throttle valve. The interior of the sleeve 53 is of larger diameter than the part of the sleeve 43 which it encircles so that the grip member 51 may be oscillated freely for unseating the throttle valve.

In the form of the invention illustrated in Figures 4 and 5, a plate 54 encircling the bolt 40 is secured to the side of the back head 28 and held against endwise movement by a spacer 55 on the bolt 40 and acting with its opposite end against the head 45 of the bolt. The spacer 55 is of frusto-conical shape and the end of minimum diameter of the spacer abuts the plate 54.

Encircling the spacer 55 is a tubular grip member 56 of which the outermost end 57 of the internal surface seats or bears against the periphery of the portion of maximum diameter of the

spacer 55. The grip member 56, therefore, has only line contact with the spacer 55 and may be oscillated freely relatively to the handle for actuating the valve 35. Preferably a cap 58 is disposed on the end of the grip member 56 to protect the grip member against wear incident to the operation of the valve 35, and the confronting surfaces 59 and 60 of the cap 58 and the plate 54 are curved correspondingly to permit of free oscillatory movement of the grip member.

In order to prevent rotary movement of the grip member 56 with respect to the handle the cap 58 and the plate 54 are provided with interlocking portions 61 and 62, respectively. The portion 61 is in the form of a lug slidable in a groove defined by the portion 62.

Referring now to the form of the invention illustrated in Figures 6 and 7 a spacer 63 encircling the bolt 40 is interposed between the head 45 of the bolt and the back head 28 and has an external flange 64 intermediate its ends. The flange 64 serves as an abutment for a stationary grip member 65 encircling the portion of the spacer 63 lying between the flange 64 and the head of the bolt.

Encircling the end of the spacer 63 between the flange 64 and the back head 28 is a movable sleeve 66 which, in effect, constitutes a continuation of the grip member 65. The sleeve 66 is adapted to move longitudinally of the rock drill, having an oblong bore 67 to permit of such movement. On the forward surface of the sleeve is a stem 68 which engages the stem 36 of the throttle valve for unseating the throttle valve. The stem 68 extends into the bore 33 to prevent rotary movement of the sleeve 66 with respect to the handle.

I claim:

1. In a rock drill, the combination of a back head portion, a handle having grips extending laterally from the back head, a throttle valve in the back head for controlling the admission of pressure fluid into the rock drill, a stem disposed at one side of and directed toward the handle, a movable grip member on one of said handle grips non-rotatable with respect thereto, and a ring-like portion on the movable grip member encircling one of said handle grips to loosely contact one of said steps and radially movable with respect to said handle grip to depress said stem.

2. In a rock drill, the combination of a casing and a handle therefor, a throttle valve for controlling the admission of pressure fluid into the rock drill, a grip member encircling the handle oscillatable about one end thereof for actuating the throttle valve, and guide means at the opposite end of said grip member to prevent rotary movement of the grip member with respect to the handle.

3. In a rock drill, the combination of a casing and a handle therefor, a throttle valve for controlling the admission of pressure fluid into the rock drill, a grip member encircling the handle oscillatable about one end of the grip member for actuating the throttle valve, and interlocking slidable guide portions on the opposite end of the grip member and on the rock drill for preventing rotary movement of the grip member with respect to the handle.

4. In a rock drill, the combination of a casing and a handle therefor, a throttle valve for controlling the admission of pressure fluid into the rock drill, a grip member encircling the handle and having an internal seating surface at one end in engagement with the handle to permit of oscillatory movement of the gripping member for actuating the throttle valve, and interlocking portions on the grip member and the rock drill for preventing rotary movement of the grip member with respect to the handle.

5. In a rock drill, the combination of a back head portion, a handle having grips extending laterally from the back head, a throttle valve in the back head portion, a throttle valve stem disposed at one side of and directed toward the handle, a recess portion on said handle, a movable grip member non-rotatable with respect to the handle, and a ring-shaped portion formed on said movable grip member of substantially larger diameter than the recess portion and movable radially with respect to said handle being guided by said recess portion to contact loosely with and to depress said stem.

6. In a rock drill, the combination of a back head portion, a handle having grips extending laterally from the back head, a throttle valve in the back head portion for controlling the admission of pressure fluid into the rock drill, a stem on the throttle valve disposed at one side of and directed toward the handle, a recess portion formed on one side of said lateral grips, a movable grip member associated with the recessed handle grip, a ring-like portion on said movable grip member of substantially greater diameter than a surrounding said recess portion adapted to contact said stem loosely and being movable radially with respect to said handle to depress said stem, and guide portions formed on the ring-like portion and the recessed handle grip to prevent rotation of the movable grip member with respect to the lateral grip member.

7. In a rock drill, the combination of a back head portion, a handle having grips extending laterally from the back head, a throttle valve in the back head portion having a stem disposed at one side of and directed toward the handle, a recessed portion on said handle, and a valve operating member having a ring-like portion of substantially larger diameter than said recessed portion and held in place thereby, said ring-like portion being arranged to contact loosely with said stem and being movable radially with respect to said handle to depress the said stem.

GEORGE H. FUEHRER.