

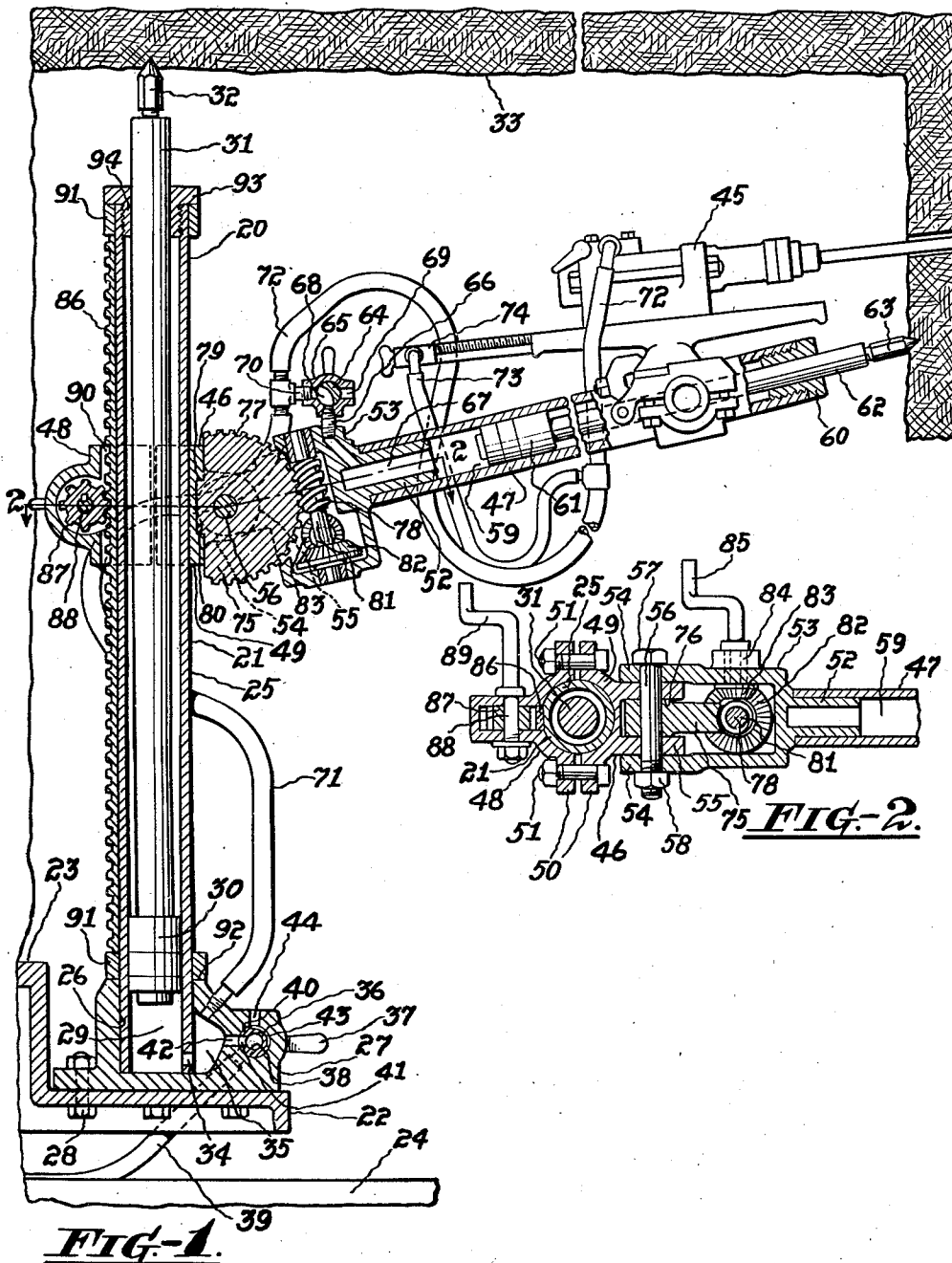
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MOUNTING FOR ROCK DRILLS

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MOUNTING FOR ROCK DRILLS

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This invention relates to drilling mechanism, and more particularly to a mounting for rock drills of the drifter type.

One object of the invention is to enable the rock drill to be easily and quickly set in a desired drilling position.

Another object is to lighten the work of moving the rock drill with respect to the mounting from one drilling position to another.

Still another object is to provide a stable support for the rock drill.

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 a rock drill mounting constructed in accordance with the practice of the invention, and

Figure 2 is a transverse view taken through the mounting on the line 2—2.

Referring more particularly to the drawing, the mounting, designated in general by 20, comprises a column 21 of the extensible type that stands upon a platform 22 of a truck 23 resting upon a track 24.

The column 21 is of the pressure fluid actuated type. It comprises a vertical cylinder 25 that extends with its lowermost end into the bore 26 of a base plate 27 constituting the lower end of the column and secured to the platform 22 by bolts 28. The interior of the cylinder 25 serves as a piston chamber 29 to accommodate a piston 30, and on the piston 30 is a rod 31 that projects from the upper end of the cylinder 25 and carries a pointer 32 for engagement with overlying rock 33.

In the lower end of the cylinder is a port 34 that opens into a supply chamber 35 in the base plate 27, and in the base plate is a valve 36 for controlling the admission and exhaust of pressure fluid into and from the chamber 35, and thus the piston chamber 29. The valve 36 is shown as being of the rotary type, having a lever 37 whereby it may be manipulated, and in said valve is a bore 38 into which pressure fluid is constantly admitted by a supply conduit 39 connected to the base plate 27 to open into the chamber 40 containing the valve 36.

In the wall of the valve 36 is a port 41 for registration with a passage 42 leading from the chamber 40 to the chamber 35, and in the peripheral surface of the valve 36 is a partly annular groove 43 to afford communication between the passage 42 and an exhaust port 44 leading from the chamber 40 to the atmosphere.

The above described devices are so arranged and operate in such wise that whenever it is intended to set up the column adjacent a working surface and secure it firmly in position between the platform and the overlying rock, the valve 36 is rotated into position to place the port 41 in registration with the passage 42. Pressure fluid will then flow through these channels, the chamber 35 and the port 34 into the lower end of the piston chamber 29 and drive the piston 30 and the pointer 32 upwardly to press the latter into engagement with the rock.

If it be intended to release the pointer 32 from the rock, the valve 36 is rotated to place the groove 43 into communication with the passage 42 and the exhaust port 44. The pressure fluid will then escape from the lower end of the piston chamber 29 to permit the piston 30 to descend by gravity and withdraw the pointer 32 from its rock engaging position.

As is customary, the column 21 serves to support the weight of a drifter type rock drill designated 45, and a bearing 46 is accordingly disposed on the cylinder 25 to support an end of an arm 47 upon which the rock drill 45 is mounted. The bearing 46 is of generally sleeve shape. It is split longitudinally to divide it into a pair of sections 48 and 49 that have flanges 50 on their opposed side surfaces suitably spaced with respect to each other to enable the sections to be firmly clamped to the cylinder 25 by bolts 51 extending through the flanges.

The arm 47 is connected only to the section 49, and in the form shown is telescopically connected with a stem 52 of a gear box 53 having at its opposite end a pair of lugs 54 that seat against the outer surfaces of a projection 55 on the side of the bearing section 49. The lugs 54 and the projection 55 are apertured to receive a pin 56 that serves as a horizontal pivot for the arm 47. The pin 56 may, as shown, be in the form of a bolt having the usual head 57 at one end to seat against the outer surface of a lug 54 and a nut 58 threaded thereon to seat against the outer surface of the other lug 54.

The arm is hollow, its interior serving as a piston chamber 59 that has a guide bushing 60 threaded into its outer end, and in the piston chamber 59 is a piston 61 having a rod 62 that extends slidably through the guide bushing 60 and carries a pointer 63 for engagement with a rock surface, as for example the wall or end of a tunnel. The piston 61 is actuated by pressure fluid for pressing the pointer 63 against such wall, and the admission of pressure fluid and the exhaust thereof, to and from the piston cham-

ber 59 is controlled by a valve 64 on the gear box 53.

The casing 65 for the said valve is connected to the gear box by a nipple 66 that opens into a passage 67 leading through the gear box and the stem 52 to the piston chamber 59. The valve 64 is of the rotary type and has a recess 68 in the side thereof to selectively afford communication between the nipple 66 and an atmospheric exhaust port 69 in the casing 65 and between the nipple 66 and a connection 70 threaded to the casing 65.

A conduit 71 leading from the chamber 35 to the connection 70 serves to convey pressure fluid to the valve 64 and also to a conduit 72 leading from the connection 70 to the rock drill 45 and, in the example shown, through a branch conduit 73 leading from the conduit 72 to a fluid actuated feeding motor 74, of a well known type, used for moving the rock drill 45 toward and from the work.

In order to facilitate the operation and make less burdensome the work of swinging the arm 47 and parts carried thereby in a vertical plane about the pivot 56, a stationary segment gear 75 is arranged in a slot 76 in the lug 54 and its teeth 77 mesh with the thread of a worm 78 in the gear box 53. The segment gear is held fixedly in position in the projection 55 by the pivot 56 which extends through the segment, and by a lug 79 on the chord side of the gear extending into a depression 80 at the bottom of the slot 76.

The ends of the shaft 81 carrying the worm 78 are journaled in the upper and lower walls of the gear box 53, and on said shaft is a gear 82 that meshes with a pinion 83 carried by a shaft 84 extending through the wall of the gear box to the exterior thereof and having a crank 85 whereby the worm 78 may be manually rotated.

Means are also provided to enable the bearing 46, together with the elements which it supports, to be conveniently moved endwise of the cylinder 25 in order to place the rock drill 45 in a desired position with respect to the working surface. To this end a rack 86 is disposed loosely on the outer surface of the cylinder 25 to extend approximately along the entire length thereof, and in the bearing section 48 is a gear 87 to mesh with the rack. The gear 87 is keyed to a shaft 88 journaled in the wall of the bearing section 48 and on one end of said shaft is a crank 89 for rotating the gear.

The rack 86 lies in a slot 90 in the inner or bearing surface of the section 48 so that the rack is held in the correct assembled relationship with the gear 87 and will also rotate with the bearing about the cylinder 25. On the upper and lower ends of the rack 86 are collars 91 that encircle the cylinder and are rotatable thereon to stabilize the ends of the rack. The lower collar 91 seats upon the top surface 92 of the base plate 27, and the rack is held against movement in an upwardly direction by an external flange 93 of a bushing 94 threaded into the upper end of the cylinder 25 to guide the rod 31.

In the operation of the device, whenever it is intended to place the mounting in position to support the rock drill 45 adjacent a working surface the column 21 is extended in the manner previously described and the bearing 46 is then raised, or lowered, by rotation of the crank 89 to place the arm 47 in substantially the desired position. The bolts 51 are next manipulated to clamp the bearing sections fixedly to the cylinder 25.

Thereafter, the worm 78 is rotated, by means of the crank 85, to swing the arm 47 upwardly or downwardly to the desired angle with respect to the work, and the valve 64 is then placed in position to establish communication between the connection 70 and the nipple 66.

In this position of the valve 64 pressure fluid will flow through the passage 67 into the piston chamber 59 and drive the piston 61 outwardly, thereby pressing the pointer 63 against the working surface. The entire mounting, including the free end of the arm 47, will then be firmly braced and supported to enable it to withstand the vibration to which it is subjected during the operation of the rock drill 45.

After the drill hole has been completed and it is intended to place the rock drill 45 in another drilling position, as for example for the drilling of a hole in the same horizontal plane as the previously drilled hole, the valve 64 is rotated to a position to place the recess 68 in registry with the nipple 66 and the exhaust port 69. The pressure fluid will then escape from the piston chamber 59 to the atmosphere and the pointer 63 may move out of or be readily withdrawn from engagement with the rock surface. The clamping force of the bolts 51 is then relieved sufficiently to enable the bearing to be rotated about the column.

During such rotative movement of the bearing the rack 86 will rotate with it, and when the rock drill has been again suitably positioned with respect to the work the bearing sections 48 and 49 are clamped to the cylinder and pressure fluid is then admitted into the piston chamber 59 to actuate the piston 61 for driving the pointer 63 against the rock surface.

As will be readily seen from the foregoing description, the arm 47 may be conveniently and quickly shifted relatively to the column, both rotatively and vertically, to place the rock drill in a favorable drilling position with respect to the work and with a minimum of effort on the part of the operator.

I claim:

1. A mounting for rock drills and the like, comprising a cylindrical support member, a bearing rotatable on the support member, means on the bearing to support a rock drill, a rack extending along the side of the support member and interlockingly engaging the bearing to rotate therewith on the support member, collars affixed to the rack rotatable on the support member to enable the rack to rotate about the support member, and a pinion in the bearing in engagement with the rack for moving the bearing axially of the support member.

2. A mounting for rock drills and the like, comprising a cylindrical support member, a bearing rotatable on the support member split longitudinally into a pair of sections, means for clamping the sections to the support member, a rack extending through one of the sections in interlocking engagement therewith to rotate with the section on the support member and lying loosely on the surface of the support member, collars affixed to the rack rotatable on the support member to enable the rack to rotate about the support member, a pinion in one of the sections engaging the rack for moving the bearing axially of the support member, and means for supporting the rock drill and being pivotally connected to the other bearing section.