July 11, 1939. C. F. OSGOOD 2,165,904

ROCK DRILLING MECHANISM

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Fig. 1.

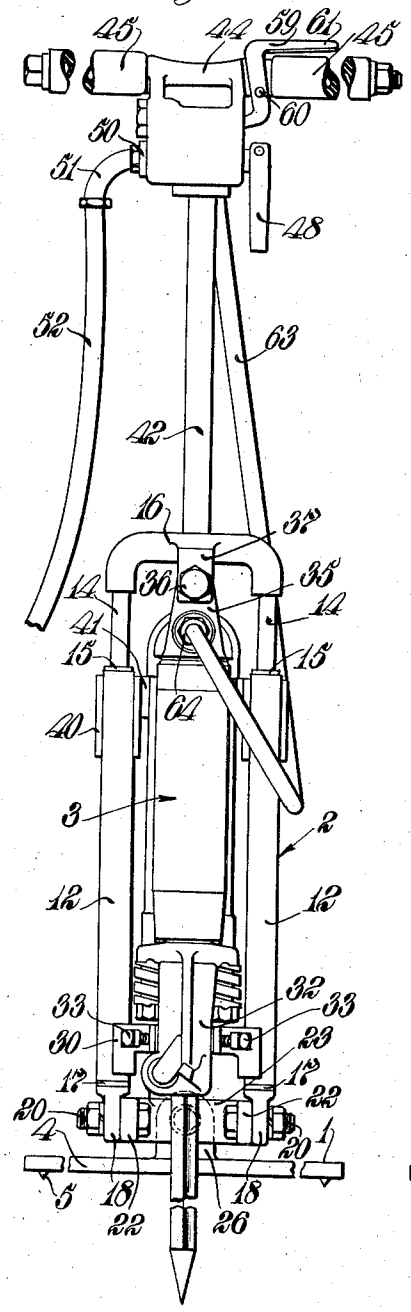
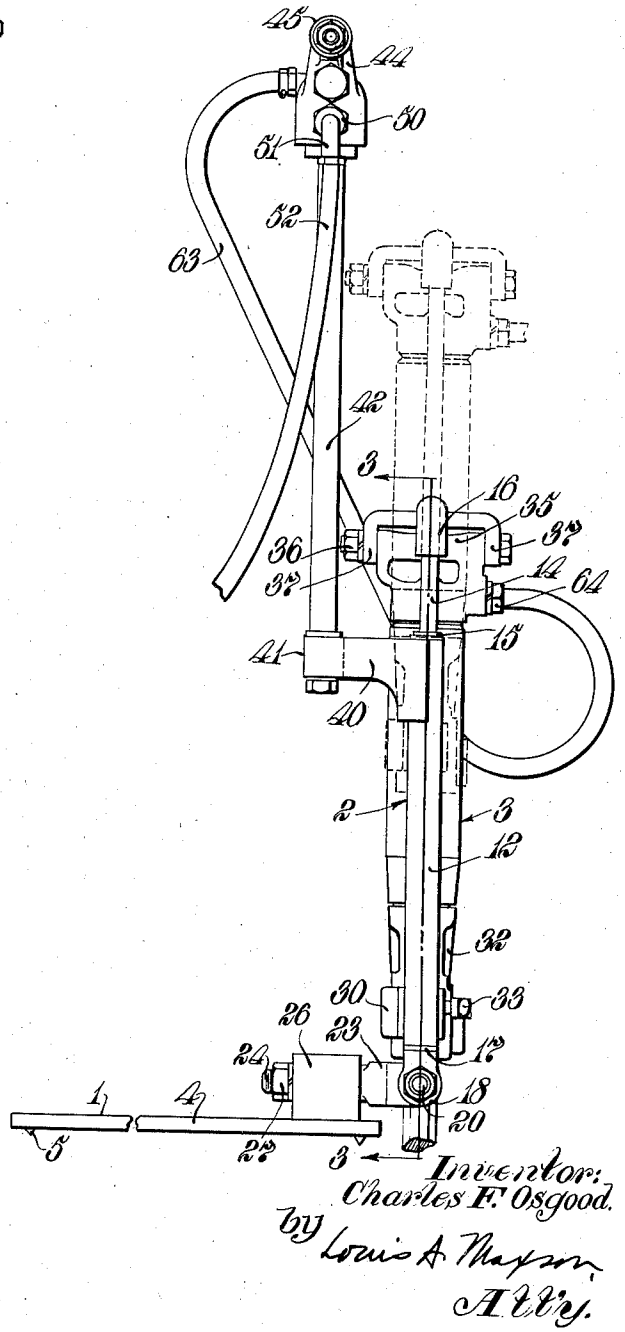


Fig. 2.



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Fig. 3.

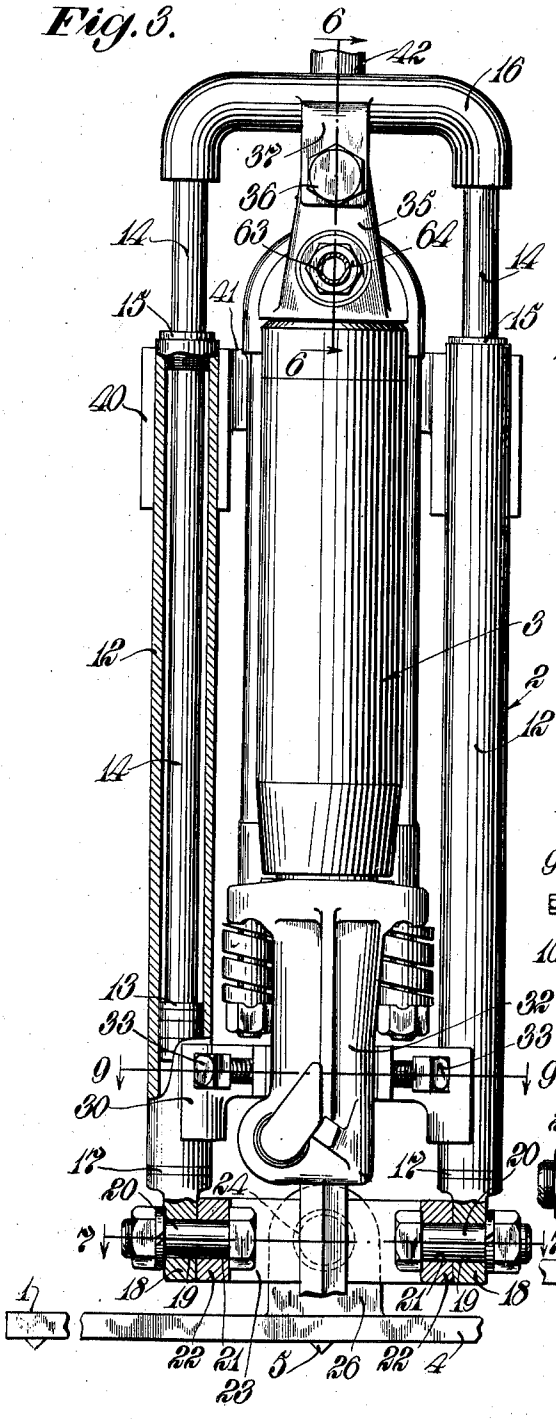


Fig. 4.

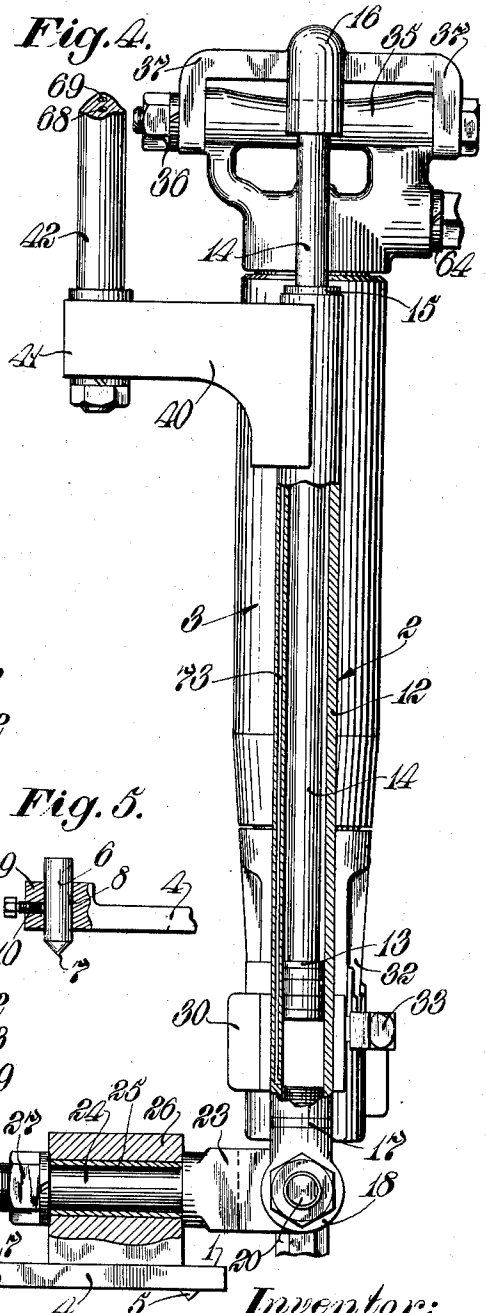


Fig. 5.

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ROCK DRILLING MECHANISM

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Fig. 6.

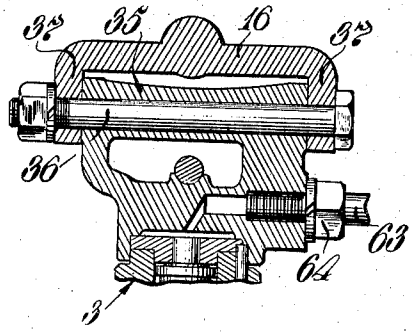


Fig. 7.

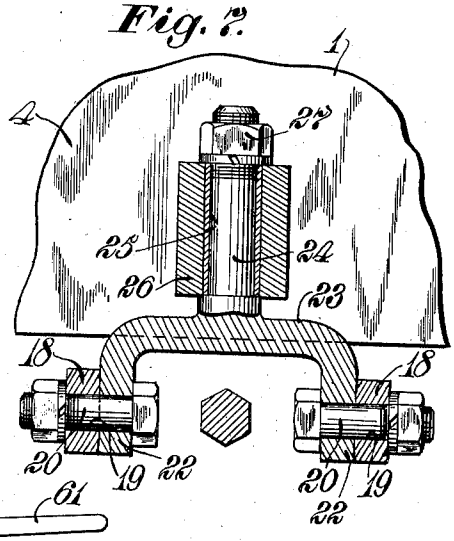


Fig. 8.

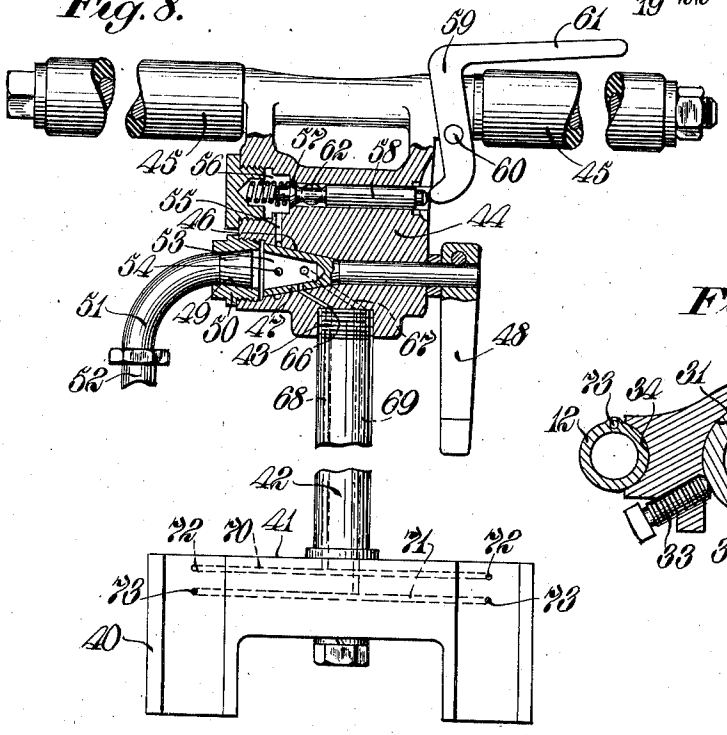
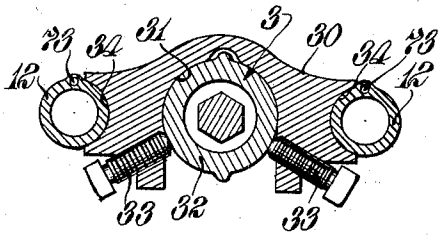


Fig. 9.



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UNITED STATES PATENT OFFICE

2,165,904

ROCK DRILLING MECHANISM

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Application September 25, 1935, Serial No. 42,073

4 Claims. (Cl. 255—51)

This invention relates to rock drilling mechanism, and more particularly relates to an improved adjustable supporting, guiding, and feeding structure for a hammer rock drill of the hand-held type.

An object of this invention is to provide an improved rock drill supporting means. Another object is to provide an improved supporting and guiding structure for a hammer rock drill of the hand-held type. A further object is to provide an improved adjustable supporting structure whereby a hammer rock drill of the hand-held type may be fed and guided with respect to the work with comparative facility. A still further object is to provide an improved means for adjustably supporting, guiding and feeding a hammer rock drill of the hand-held type with respect to the work, and having embodied therein improved control means for the feeding means and rock drill. These and other objects and advantages of the invention will, however, hereinafter more fully appear in the course of the following description and as more particularly pointed out in the appended claims.

In the accompanying drawings there is shown for purposes of illustration one form, with a detail modification thereof, which the invention may assume in practice.

In these drawings:

Fig. 1 is a front elevational view of a rock drilling mechanism embodying the improved adjustable supporting, feeding and guiding structure.

Fig. 2 is a side elevational view of the rock drilling mechanism shown in Fig. 1.

Fig. 3 is an enlarged vertical sectional view, with parts shown in elevation, taken substantially on line 3—3 of Fig. 2.

Fig. 4 is an enlarged side elevational view of the structure shown in Fig. 3, with parts shown in section to illustrate structural details.

Fig. 5 is a detail view showing a modified form of adjustable support.

Fig. 6 is a detail sectional view taken substantially on line 6—6 of Fig. 3.

Fig. 7 is a cross sectional view taken substantially on line 7—7 of Fig. 3.

Fig. 8 is an enlarged view of the drill supporting handle, with parts shown in vertical section.

Fig. 9 is a cross sectional view taken substantially on line 9—9 of Fig. 3.

In this illustrative embodiment of the invention there is shown a base 1 having adjustably mounted thereon drill supporting, feeding and guiding means generally designated 2, on which is supported and guided a hammer rock drill, generally designated 3, of a conventional design. The base 1 is herein in the form of a foot plate 4 upon which the drill operator stands during the drilling operation, said foot plate having abutment engaging points or feet 5 engageable with the drill supporting surface. As shown in Fig. 5, the abutment engaging points for the foot plate may be in the form of adjustable pins 6 having pointed ends 7 engageable with the drill supporting surface and guided in vertical bores 8 formed in bosses 9 integral with the foot plate. Set screws 10 threaded within the bosses 9 may be employed for securing the pins 6 in their adjusted position. In certain forms of the invention, the foot plate 4 may be mounted on wheels to facilitate maneuvering of the rock drill from one working place to another, and the support wheels may be made detachable so that they may be removed from the foot plate during the drilling operation.

Now referring to the improved adjustable supporting, feeding and guiding structure 2, it will be noted that arranged in longitudinal parallel relation are feed cylinders 12, 12 having reciprocably mounted therein feed pistons 13. Secured to the feed pistons are upwardly projecting piston rods 14 extending through the packed upper heads 15 of the feed cylinders and secured at their upper ends within a transverse connecting yoke 16. Secured to the lower heads 17 of the feed cylinders are bearing lugs 18 pivotally mounted at 19 on transverse bolts 20, the latter in turn being secured at 21 within the arms 22 of a U-shaped supporting member 23. As shown in Fig. 4, the member 23 has formed integral therewith a horizontal bolt 24 journaled at 25 on a longitudinal axis within an upstanding bearing portion 26 formed integral with the foot plate 4, and this bolt has threaded thereon a retaining nut 27 for retaining the bolt in its bearing. The pivot bolts 20, 20 and 24 are arranged on rectangularly related axes to provide a universal pivotal mounting for the structure 2 on the floor plate. Guided on the inner adjacent sides of the exterior peripheries of the parallel feed cylinders 12, 12 for movement longitudinally therealong is a guide member 30 having a centrally located socket 31 for receiving the front chuck housing 32 of the hammer rock drill 3. The forward end of the rock drill is rigidly secured within the socket of the guide member 30 by means of set screws 33 threaded within the member 30 and engaging the chuck housing of the rock drill in the manner shown in Fig. 9. The guide member has formed at its opposite sides concave guide surfaces 34 for slidably engaging the cylinder peripheries. The hammer

rock drill 3 is herein of the conventional hand-held type having secured to its rear head block a manual supporting handle 35, and in this instance, the handle 35 is secured by a transverse bolt 36 to lateral projections 37, 37 formed integral with the transverse yoke member 16, to which the feed piston rods 14 are secured. Secured, as by welding, to the upper portions of the parallel feed cylinders is a bracket 40 having a lateral projection 41 in which is rigidly secured the lower extremity of a rod-like handle member 42. As shown most clearly in Figs. 1 and 2, this handle member extends rearwardly longitudinally of the feeding and guiding means in parallel relation with and between the feed cylinders and has fixed thereto at its upper end, as at 43, a supporting handle 44 having lateral grasping portions 45, 45.

In this illustrative construction, mounted in a transverse bore 46 in the handle member 44 is a throttle valve 47 having an operating handle 48. Swiveled at 49 within a plug 50 secured to the member 44 is a supply connection 51 to which fluid under pressure may be supplied through a hose 52 from any suitable pressure fluid source. The throttle valve 47 is provided with an internal pressure fluid chamber 53, and a port 54 in the valve connects this chamber with a passage 55 communicating with a pressure chamber 56. The flow of pressure fluid from the chamber 56 is controlled by an end seating throttle valve 57 having a reciprocable valve stem 58 operated by a lever 59 pivotally mounted at 60 on the handle member 44 and having an operating portion 61 arranged adjacent a grasping portion of the handle. The valve 57 controls the flow of pressure fluid from the chamber 56 to a passage 62 connected by a flexible hose 63 to the inlet connection 64 of the hammer rock drill.

The throttle valve 47 also controls the supply of pressure fluid to the opposite ends of the feed cylinders 12, 12 to effect feeding movement of the hammer rock drill therealong either forwardly or rearwardly. Ports 66 and 67 connect the pressure chamber 53 in the valve 57 with passages 68 and 69 formed in the handle member 42, and these passages communicate with passages 70 and 71 formed in the handle supporting bracket 40. Passage 70 communicates through passages 72, 72 with the upper ends of the feed cylinders, while the passage 71 is connected through passages 73, 73 with the lower ends of the feed cylinders. It will thus be seen that when the valve 47 is in one position pressure fluid may be supplied to the passages 68, 70 and 72 to the upper ends of the feed cylinders to effect movement of the feed pistons downwardly with respect to the feed cylinders, thereby to effect forward feeding movement of the hammer rock drill 3 toward the work. When the valve 47 is turned into a different position, pressure fluid may flow through passages 69, 71 and 73 to the lower ends of the feed cylinders to effect upward feeding movement of the hammer rock drill rearwardly away from the work. When the valve is in either of these feeding positions, pressure fluid may flow from the passage 55, passage 62, and hose 63 to the hammer rock drill under the control of the throttle valve 57.

The mode of use of the improved rock drill will be clearly apparent from the description given. During the drilling operation the operator stands on the foot-plate 4 and grasps the grasping portions 45, 45 of the handle 44 to adjustably support and direct the drill guiding and feeding means during the drilling operation, it being possible by the provision of the improved universal pivotal mounting for the feeding and guiding means to adjust the hammer rock drill into any desired drilling position with respect to the foot plate, and being possible to swing the rock drill laterally and back and forth longitudinally as desired, the pivotal mounting providing a fulcrum point to attain a prying action on the work, and as a result greatly improving the handling of the drill. The operator by pressing against the grasping portion 61 of the valve operating lever may open the throttle valve 57 to effect flow of pressure fluid to the hammer rock drill so that the working implement of the rock drill is percussively actuated. By regulating the throttle valve 47, the rock drill may be fed upwardly and downwardly along the parallel feed cylinders as desired.

As a result of this invention it will be noted that an adjustable supporting and guiding structure is provided for a hammer rock drill of the hand-held type whereby the latter may be manipulated, with respect to the work, with comparative facility. It will further be noted that an improved adjustable supporting, guiding and feeding structure is provided for a hammer rock drill whereby the rock drill may be adjusted, directed and fed, with respect to the work, in an improved manner. It will still further be evident that by the provision of the improved adjustable supporting structure the fatiguing effect on the operator, due to the manual holding of the rapidly vibrating and comparatively heavy rock drill, is substantially eliminated, it being necessary for the operator by the provision of the improved supporting and guiding means, merely to direct the rock drill with respect to the work, wholly independently of any vibratory action of the drill and with comparative ease. Other uses and advantages of the improved rock drill will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form, with a detail modification thereof, which the 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 further 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 mechanism, a portable base, an elongated support comprising parallel feed cylinders providing a longitudinal drill guideway, means at the forward end of said support for swivelly mounting the latter on said base, said support swingable about its swivel mounting into different angularly related positions with respect to said base, a rock drill arranged between and slidably guided on said parallel feed cylinders, feed pistons reciprocable in said cylinders and having rearwardly extending piston rods, means for connecting the rear ends of said piston rods to said rock drill, means for supplying pressure fluid to said cylinders to effect reciprocation of said pistons, thereby to move the rock drill back and forth along said parallel cylinders, and a handle secured to the rearward end of said support and having an elongated rearwardly extending handle portion provided at its rear end with a manual grasping portion whereby said support may be swung about its swivel mounting with respect to said base.

2. In a rock drilling mechanism, a portable base,

an elongated support comprising parallel feed cylinders providing a longitudinal drill guideway, means at the forward end of said support for swivelly mounting the latter on said base, said support swingable about its swivel mounting into different angularly related positions with respect to said base, a pressure fluid actuated rock drill arranged between and slidably guided on said parallel feed cylinders, feed pistons reciprocable in said cylinders and having rearwardly extending piston rods, means for connecting the rear ends of said piston rods to said rock drill, means for supplying pressure fluid to said cylinders to effect reciprocation of said pistons, thereby to move the rock drill back and forth along said parallel cylinders, a handle secured to the rearward end of said support and having an elongated rearwardly extending handle portion provided at its rear end with a manual grasping portion whereby said support may be swung about its swivel mounting with respect to said base, and means carried by said handle for controlling the supply of pressure fluid to said feed cylinders and said rock drill.

3. In a rock drilling mechanism, a portable base, an elongated support comprising parallel feed cylinders providing a longitudinal guideway, means at the forward end of said support for swivelly mounting the latter on said base, said support swingable about its swivel mounting into different angularly related positions with respect to said base, feed pistons reciprocable in said feed cylinders and having rearwardly extending piston rods, a sliding guide member mounted on said cylinders for movement longitudinally therealong, a transverse frame connecting the rearward ends of said piston rods, a rock drill arranged longitudinally between said feed cylinders, means carried by said guide member and transverse frame for detachably securing said rock drill in position thereon between said cylinders, and a handle secured to the rearward end of said support and having an elongated rearwardly extending handle portion provided at its rear end with a manual grasping portion whereby said support may be swung about its swivel mounting with respect to said base.

4. In a rock drilling mechanism, a portable base, a frame swivelly mounted on said base on a horizontal axis extending longitudinally of said base, said frame having a yoke-shaped portion provided with arms, parallel feed cylinders pivotally mounted at their forward ends on said arms of said yoke-shaped frame portion to swing relative thereto about axes arranged at right angles to said swivel frame axis, pistons reciprocable in said cylinders and having rearwardly extending piston rods, a rock drill arranged between and slidably guided on said cylinders, means for connecting the rear ends of said piston rods to the rearward end of said rock drill, a transverse frame connecting together said cylinders at their rear ends, and a handle secured to said transverse connecting frame for swinging said swivelly mounted frame and cylinders about their respective axes to vary the angular position of the rock drill with respect to said base.

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