Nov. 20, 1945. F. M. SLATER 2,389,558

MOUNTING FOR ROCK DRILLS

Filed Sept. 13, 1944 2 Sheets-Sheet 1

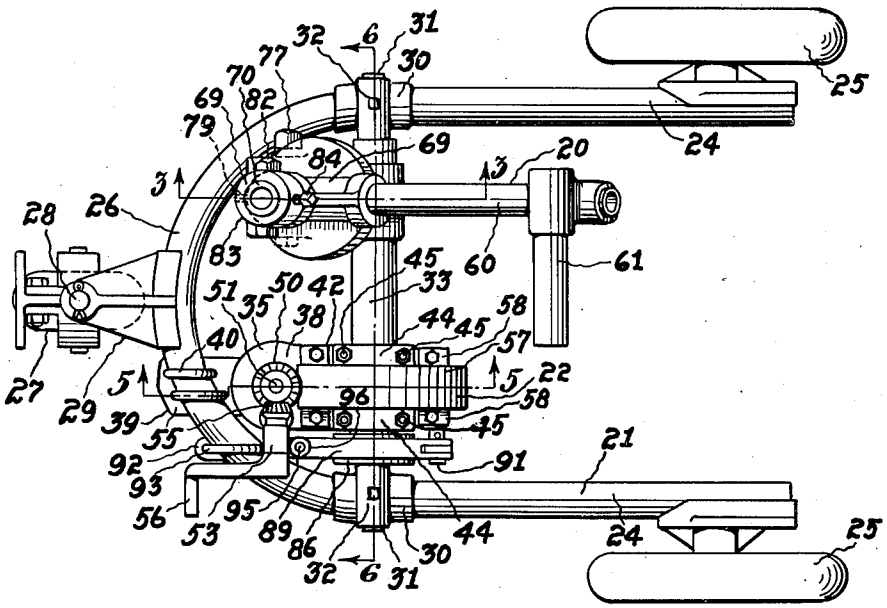

FIG.-2.

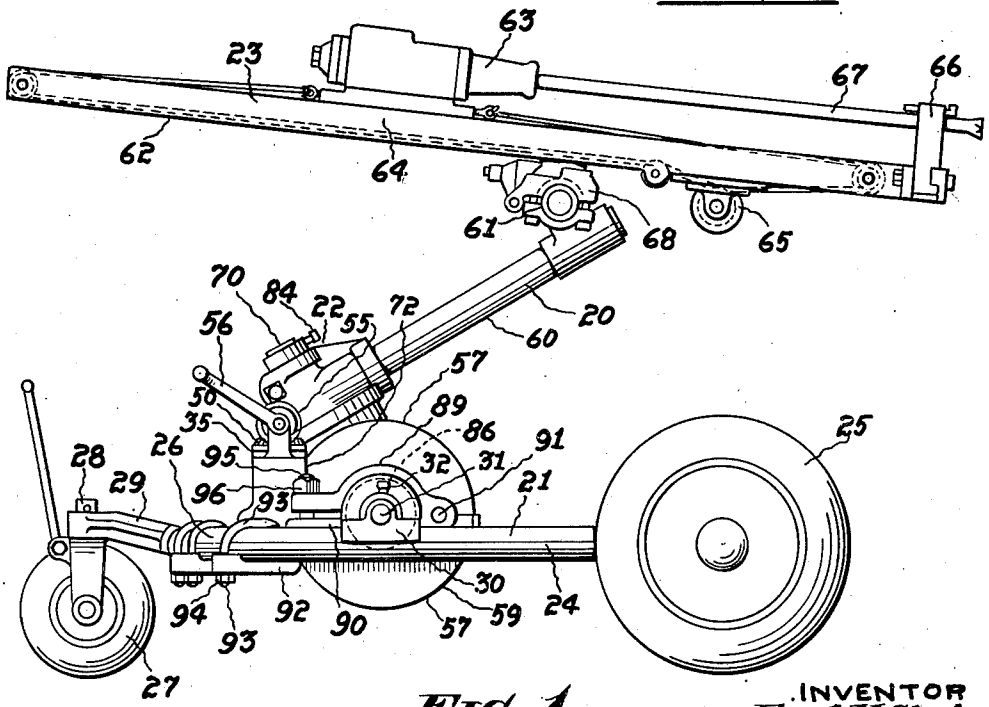

FIG.-1.

INVENTOR
Fred M. Slater
BY
HIS ATTORNEY.

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Filed Sept. 13, 1941 2 Sheets-Sheet 2

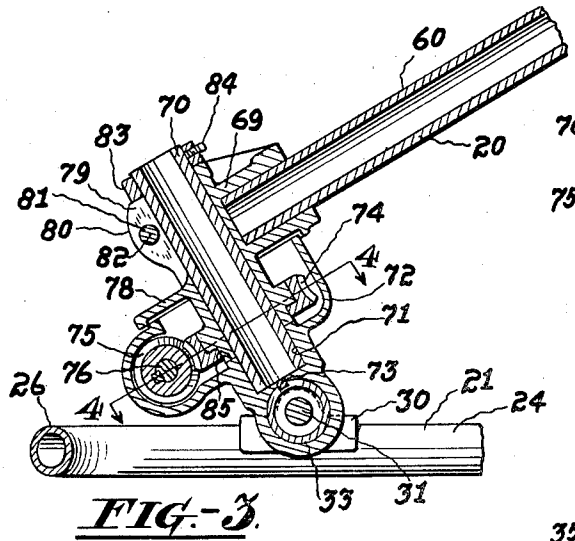

FIG.-3.

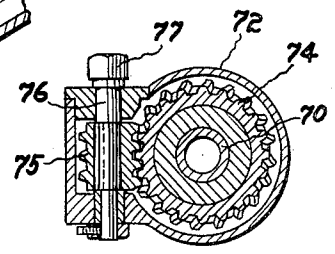

FIG.-4.

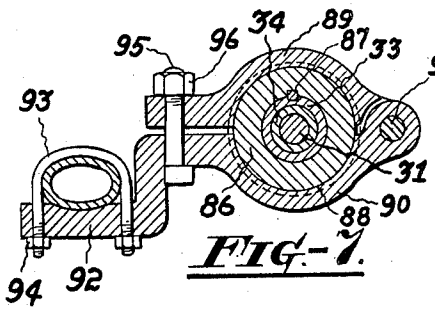

FIG.-7.

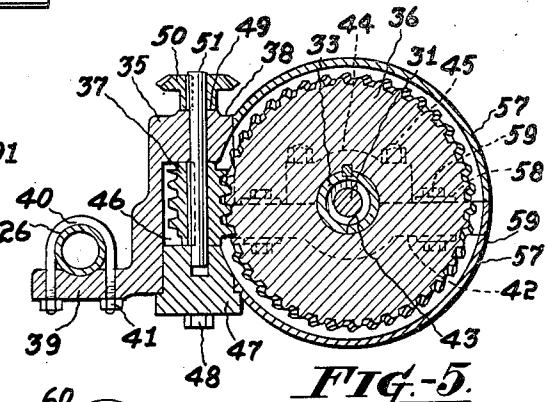

FIG.-5.

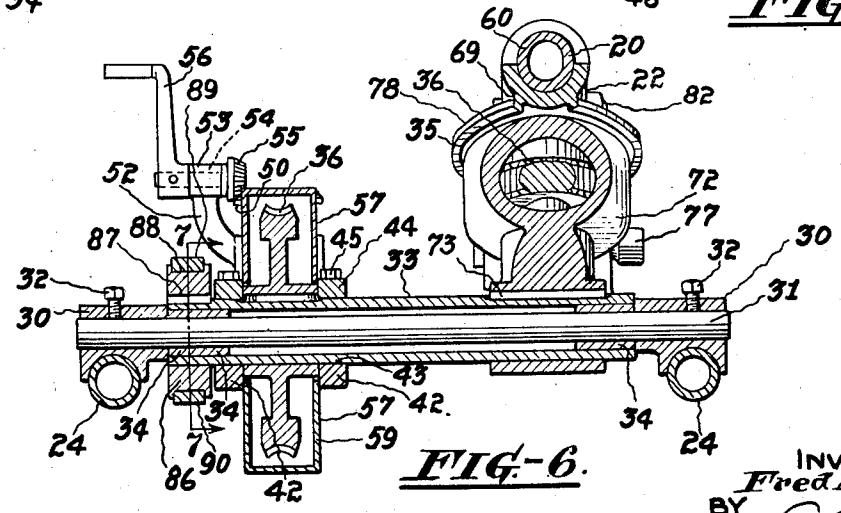

FIG.-6.

INVENTOR
Fred M. Slater.
BY
HIS ATTORNEY.

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UNITED STATES PATENT OFFICE

2,389,558

MOUNTING FOR ROCK DRILLS

Fred M. Slater, Phillipsburg, N. J., assignor to Ingersoll-Rand Company, New York, N. Y., a corporation of New Jersey

Application September 13, 1944, Serial No. 553,811

2 Claims. (Cl. 255—51)

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 enable a rock drill to be shifted with respect to the work and to the mounting with a minimum of effort on the part of the operator.

A further object is to assure a rigid support for the rock drill.

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

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

Figure 1 is a side elevation of a mounting constructed in accordance with the practice of the invention and a rock drill supported by the mounting,

Figure 2 is a plan view of the mounting,

Figure 3 is a transverse view taken through Figure 2 on the line 3—3 illustrating the manner in which the boom that supports the rock drill is connected to the frame of the mounting for pivotal movement,

Figure 4 is a transverse view taken through Figure 3 on the line 4—4,

Figures 5 and 6 are similar views taken through Figure 2 on the lines 5—5 and 6—6, respectively, and

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

Referring more particularly to the drawings, the mounting, designated in general by 20, comprises a main frame 21 and an adjusting mechanism 22 on the main frame to support a rock drilling mechanism 23 and position it correctly with respect to a working surface.

The frame 21 is shown as being of U-shape, the free ends of the arms 24 being supported by wheels 25 and the curved part 26 by a caster 27 the spindle 28 of which extends into a bracket 29 on the frame.

In accordance with the practice of the invention, the frame 21 is provided with a pair of bearings 30 on the arms 24 near the curved portion 26, and a rod 31 has its ends arranged in the bearings 30 and secured thereto by set screws 32 to stiffen the frame 21 at this point.

Encircling the rod 31, between the bearings 30, is a hollow shaft 33 having bushings 34 in its ends to bear upon the rod 31. The shaft 33 is rotatable upon the rod 31 and such movement is effected by a device 35 arranged upon the frame and the hollow shaft adjacent a bearing 30. The device 35 includes in its organization a worm gear 36 that is keyed to the shaft 33 and meshes with a worm 37 arranged in a casing 38 supported by the frame 21 and the hollow shaft 33. The casing is accordingly provided with a laterally extending wing 39 that is clamped to the curved portion 26 of the frame by a U-bolt, or bolts, 40 and nuts 41, and arms 42 on the casing 38 lie beneath the hollow shaft on opposite sides of the gear 36 and are provided with semi-circular recesses 43 to receive the shaft 33. Caps 44 are seated upon the arms 42 and are suitably recessed to conform to the curvature of the shaft 33. The caps 44 may be secured to the arms in any convenient manner, as for example by bolts 45.

The body of the casing 38 is arranged perpendicularly to the plane of the frame 21 and the chamber 46 containing the worm 37 opens from the lower end of the body and is normally closed by a cover 47 that is secured to the casing 38 by bolts 48. The upper end of the casing 38 constitutes a seating surface 49 for an end of a gear 50 keyed to a shaft 51 extending through the worm and with its lower end into the cover 47.

On the side of the casing 38 is a bracket 52 having a bearing 53 at its upper end for a shaft 54 carrying a pinion 55 to mesh with the gear 50. The shaft 54 is provided with a crank 56 whereby the gears 55, 50, the worm 37 and the worm wheel 36, may be turned for rotating the shaft 33 on the rod 31.

Preferably, a guard in the form of a pair of partly circular covers 57 is provided for the worm gear 36, and on the sides of the covers are ears 58 that seat against the upper and lower surfaces of the arms 42 and are fastened to them by screws 59.

The shaft 33 carries a boom 60 having an arm 61 at its free end to support a rock drilling mechanism 62 including a rock drill 63 that is mounted slidably upon a guide 64 which has arranged thereon a suitable feeding mechanism 65 for moving the rock drill along the guide. The guide has a centralizer 66 at its forward end to stabilize a working implement 67 actuated by the rock drill 63. The arm 61 extends transversely of the boom 60, and a clamping mechanism 68, of a well known type, serves to secure the guide 64 to the said arm.

The boom is arranged to swing with the shaft 33 for movement in a vertical plane and accord-

ingly has a hub 69 that is bored to receive a pivot 70 carried by and extending perpendicularly of the shaft 33. The pivot 70 has an end seated in a bore 71 of a gear box 72 carried by the shaft 33 and secured thereto by a key 73, and the pivot 70 may be affixed to the gear box in any suitable manner, as for example by press-fitting it into the bore 71.

The hub 69 rotates freely upon the pivot 70, and in order to effect such movement the hub is provided with a worm gear 74 that meshes with a worm 75 in the gear box 72. The worm is keyed to a shaft 76 journaled in the gear box, and on an end of the shaft lying exteriorly of the gear box is a head 77 for engagement with a wrench (not shown) whereby the worm may be rotated.

On the intermediate portion of the hub 69 is an external flange 78 that overlies the gear box 72 to form a cover therefor. A slot 79 extends from the flange 78 to the upper end of the hub, and on opposite sides of the slot 79 are lugs 80 having apertures 81 to receive a bolt 82 whereby the upper end of the hub may be clamped to the pivot 70.

A collar 83 fastened to the upper end of the pivot 70 by a set screw 84 prevents movement of the hub 69 in an upwardly direction on the pivot, and within the gear box 72, at the upper end of the bore 71, is an annular seating surface 85 for the opposite or lower end of the hub 69.

Preferably, means are also provided for locking the hollow shaft 33 securely in position and thereby protect the intermeshing portions of the gears 36 and the worm 37 against the constant wear to which they would otherwise be subjected by the vibration incident to the operation of the rock drill 63. To this end, a collar 86 is disposed upon the shaft 33 and interlockingly connected thereto by a key 87. In the periphery of the collar 86 is an annular groove 88 the bottom of which serves as a braking surface for cooperation with brake shoes 89 and 90 that are pivotally connected together by a pin 91 extending through an end of each brake shoe.

The braking portions of the shoes 89 and 90 are identical, each being suitably shaped to conform with the braking surface of the groove 88, and on the brake shoe 90 is an arm 92 that extends beneath the frame 21 and is secured to the curved portion 26 thereof by a U-bolt 93 and nuts 94. The braking or locking action of the shoes 89 and 90 is effected by a bolt 95 that extends through the arm 92 and through the free end of the brake shoe 89 and has a nut 96 threaded thereon to bear upon the shoe 89.

In the operation of the device, whenever it is intended to place the mounting in position to support the rock drill 63 adjacent a working surface the hollow shaft 33 is rotated, by means of the crank 56 and the associated gears, to tilt the boom 60 upwardly or downwardly as required. The shaft 33 is then locked fixedly in position by clamping the collar 86 between the brake shoes 89 and 90. Thereafter, the worm 75 may be rotated to swing the boom 60 on the pivot 70 to place the rock drill in the correct position with respect to the work. The boom is then locked to the pivot 70 by clamping the upper portion of the hub 69 to the pivot.

If, upon completion of a drill hole, it be intended to drill another hole from this setting of the drilling mechanism and in substantially the same horizontal plane the hub 69 is released from the pivot 70. The boom is then rotated to the new position and its hub locked to the pivot, thereby forming a rigid connection between the boom and the pivot and preventing vibratory movement of the teeth of the gear 74 on the worm 75.

As will be readily apparent from the foregoing description, the free end of the boom may be lowered to drill holes at different elevations along the working surface by rotating the shaft 33, and the rock drill may be positioned correctly in horizontal planes by operation of the worm 75 and the gear 74.

I claim:

1. A mounting for rock drills, comprising a frame, a horizontal shaft rotatable on the frame, gear means on the frame and the shaft cooperating with each other for rotating the shaft, a boom to serve as a support for a rock drill and having a hub, a gear box on and rotatable with the shaft, a pivot affixed to the gear box perpendicularly to the shaft and extending loosely through the hub, a seating surface in the gear for an end of the hub, a gear on the hub, a worm in the gear box in engagement with the gear for swinging the boom about the axis of the pivot, and locking means for locking the hub to the pivot.

2. A mounting for rock drills, comprising a frame, a horizontal rod on the frame, a hollow shaft rotatable on the rod, gear means on the frame and the shaft cooperating with each other for rotating the shaft on the rod, locking means on the frame encircling the shaft for holding the shaft against rotary movement relatively to the rod, means for locking and releasing the locking means to and from the shaft, a boom to serve as a support for a rock drill and having a hub, a gear box on and rotatable with the shaft, a pivot affixed to the gear box perpendicularly to the shaft and extending loosely through the hub, a seating surface in the gear box for an end of the hub, a gear on the hub, a worm in the gear box in engagement with the gear for swinging the boom about the axis of the pivot, and clamping means on the hub for locking the hub to the pivot.

FRED M. SLATER.