

May 6, 1958

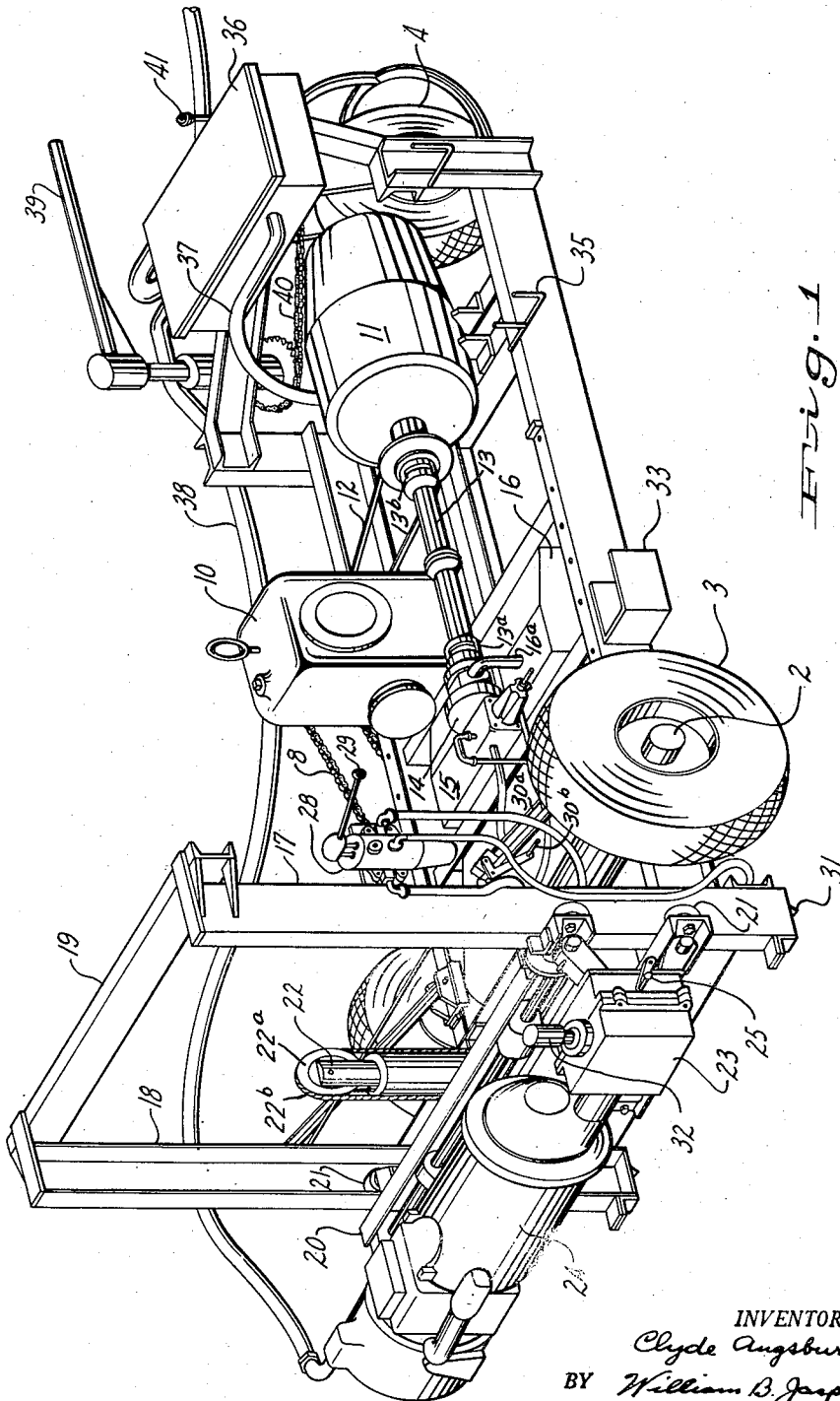
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2,833,518

PORTABLE DRILLING MACHINES

Filed Oct. 22, 1952

3 Sheets-Sheet 1



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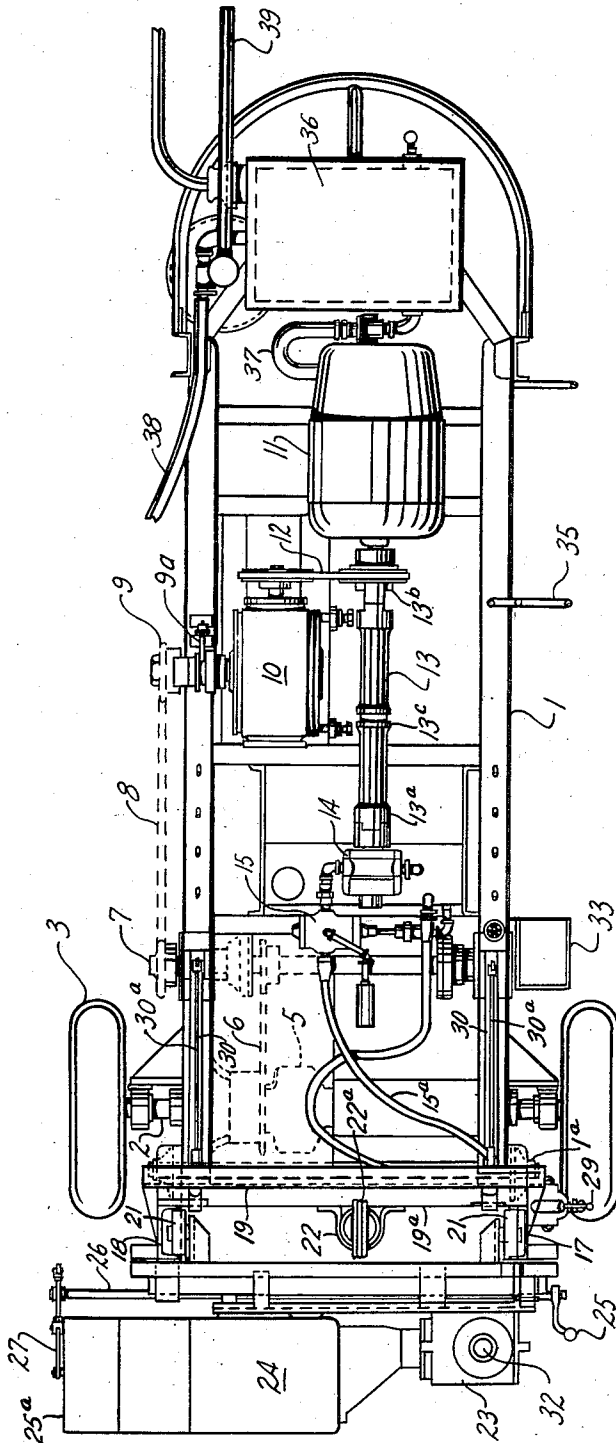


Fig. 2

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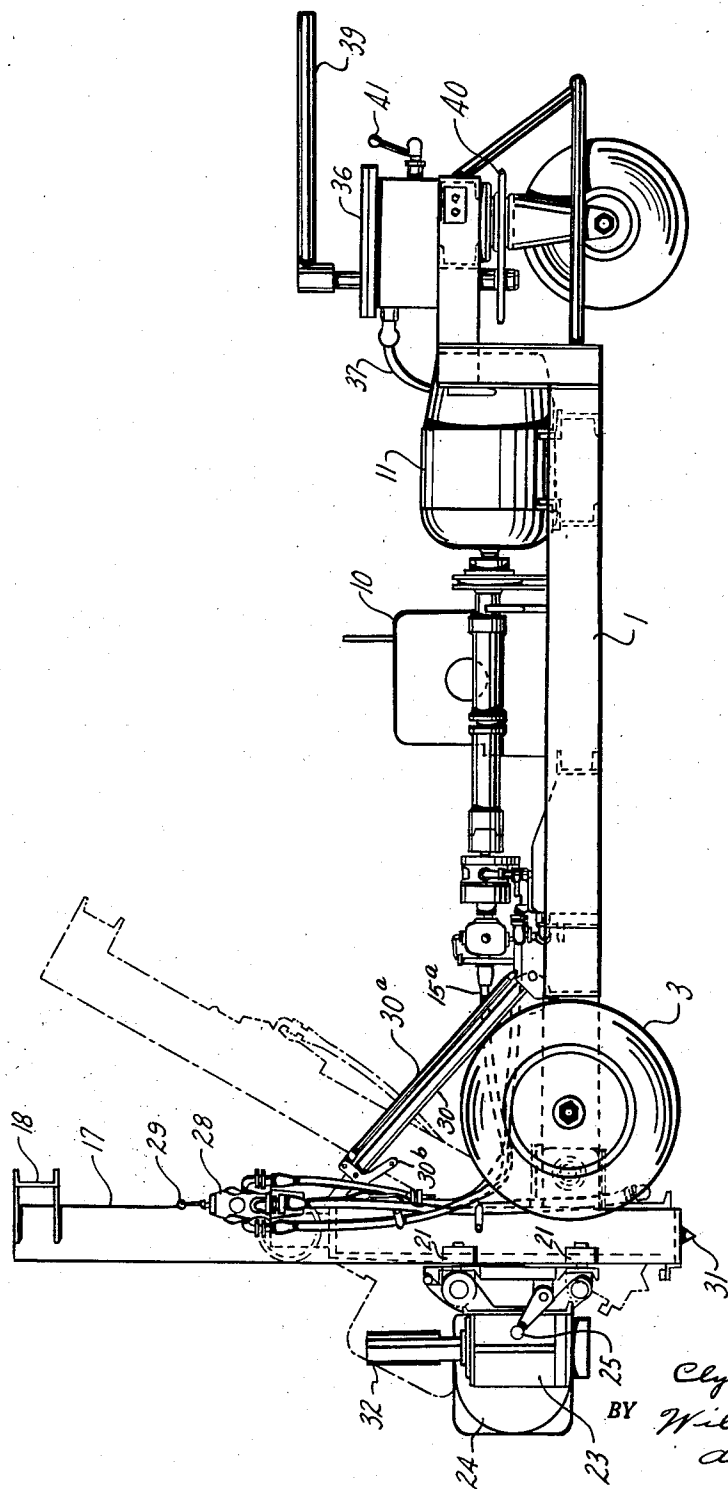
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PORTABLE DRILLING MACHINES

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Application October 22, 1952, Serial No. 316,299

2 Claims. (Cl. 255—51)

This invention relates to new and useful improvements in apparatus for drilling holes in mine roofs currently used for pinning or bolting supporting plates in the place of mine posts or columns.

It is among the objects of this invention to provide apparatus comprising a portable chassis having a pair of drive wheels and a steering wheel on which is mounted a drill support that is tiltable and which, in its operative position, constitutes a rigid support for the drill by resting on the mine floor.

It is a further object of the invention to provide means for feeding the drill on the drill support in a vertical direction and for transversing the support for the purpose of removing the drill and replacing it with longer drills after the hole has been partially drilled.

It is still another object of the invention to provide a mine roof drilling structure embodying an electric and/or an hydraulic drive and drilling power and embodying appropriate controls for operating the device and transporting it in a mine and for the drilling operations.

The invention will become more apparent from a consideration of the accompanying drawings constituting a part hereof in which like reference characters designate like parts and in which

Fig. 1 is an isometric view of a portable mine roof drilling machine embodying the principles of this invention,

Fig. 2 is a top plan view thereof, and

Fig. 3 is a side elevational view.

With reference to the several figures of the drawing, the numeral 1 designates a chassis frame supported on axles 2 having wheels 3 and on a wheel 4 at the rear thereof by which it may be steered. A gear differential 5, Fig. 2, permits the wheels 3 to travel at different speeds, as in a conventional automobile drive. The wheels 3 are driven by a sprocket chain 6, Fig. 2, from a counter shaft 7 driven by a chain 8 connected to the sprocket wheel 9 of a speed reducer 10 by means of clutch 9a. Power is transmitted to reducer 10 by a motor 11 through a belt drive 12. A clutch sleeve 13 driven by motor 11 operates a hydraulic pump 14 through clutch 13a. Clutch sleeve 13 is provided with spaced flanges 13c for receiving the bifurcated end of a shift lever (not shown) in the conventional manner. When clutch sleeve 13 between belt drive 12 and hydraulic pump 14 is shifted to engage clutch 13b of belt drive 12, it is disengaged from hydraulic pump 14 and power from motor 11 is transmitted through belt drive 12 to speed reducer 10 only. When clutch sleeve 13 is shifted to engage hydraulic pump 14, it is disengaged from belt drive 12, and power from motor 11 is transmitted to hydraulic pump 14 only which delivers fluid from sump tank 16 through relief valve 15, which controls pressure, and through pipe and/or hose 15a to hydraulic valve 28.

As shown in Fig. 1, the one side of the pump 14 is connected to a sump tank 16 by conduit 16a. The channel frames or uprights 17 and 18 with a cross channel 19

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constitute a drill guide pivotally connected to the chassis 1 at 1a and 1b. Mounted on the drill guide is a carriage generally designated by the numeral 20 which is movable vertically on rollers 21 engaging frames 17 and 18 by means of a hydraulic jack 22 that is supported on a cross-frame 19a of the drill guide as shown in Fig. 2. The hydraulic jack is provided with a sheave wheel 22a for supporting cable 22b having one end connected to the carriage 20 and the other end to the cross-frame 19a of the drill guide. As the sheave wheel 22a is raised or lowered the carriage 20 will move correspondingly. Mounted on the carriage 20 is a drill box 23 driven by an electric or hydraulic motor 24. The numeral 25 designates an operating lever for the drill motor switch 25a that is connected by a rod 26, Fig. 2, and lever 27 as shown. The hydraulic valve 28 operated by lever 29 controls the application of pressure fluid to the hydraulic jack 22 for raising and lowering the carriage.

The drill guide 17 is tilted manually on its pivotal connections 1a and 1b to the position shown in Fig. 3 or even lower. The drill guide 17 is supported in any position by means of the drill guide supports 30 which are locked and unlocked by rods 30a controlled by a crank 30b. When the drill guide 17 is tilted to the position shown in Fig. 3, or lower, the vehicle may be readily moved through the mines, and when the drill guide is adjusted to the vertical position it will raise the wheels 3 out of contact with the mine floor so that the drill guide constitutes a rigid support for the drill and drilling operation. For this purpose projecting points 31 are provided on the base of the drill guide as shown in Figs. 1 and 3. The drill gear box 23 is provided with a drill socket 32, Fig. 3, in which the long drills are inserted. A tool rack consisting of the elements 33 and 35, Fig. 1, is provided to carry the drills when not in use. At the rear of the vehicle is provided a switch and junction box 36 to which the motor 11 is connected by the cable 37 and from which the connection 38 leads to the drill motor 24. A steering arm 39 is provided for steering the wheel 4 through a chain 40, and a switch lever 41 extends from the switch in junction box 36 for operating a reversing switch not shown. The operation of the above described mechanism is briefly as follows.

The drill guide 17 is retracted to the dotted line position shown in Fig. 3 of the drawing, or even lower, to render the device portable in a mine. By operating the clutch 9a, Fig. 2, the chain drive 8 is connected to the speed reducer 10 and the vehicle is propelled in a forward or reverse direction by the driven wheels 3. By manipulating the steering arm 39 the operator can place the vehicle as desired and when in position, the drill guide frame 17 is moved to the vertical position shown in Figs. 1 and 3 with the wheels 3 lifted above the mine floor so that the entire weight on axle 2 and wheels 3 is transmitted to the base of the drill guide.

A drill is then placed in the socket 32 and the hydraulic valve handle 29 is manipulated to apply fluid to the hydraulic jack 22 that causes the carriage 20 to move vertically on the supporting frame members 17 and 18 to bring the drill in contact with the mine roof. The electrical motor 24 is then energized and the drill bores into the mine roof perhaps several feet. If the mine roof is of more than average height, a longer drill may be substituted by moving drill gear box 23 connected to motor 24 parallel to carriage 20 and out of line with the previously drilled hole and inserting a longer drill into the drill for insertion into the drill shank of 32 when the gear box is returned to the position in alignment with the drilled hole. When the hole is completed a bolt is anchored into place by an expansion shell and plug or

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wedge for securing a clamping plate that will constitute the roof support in place of the mine props heretofore employed.

It is evident from the above description of this invention that mine roof drilling apparatus made in accordance therewith is of compact and durable construction, readily transportable, and effective in the drilling operation which is entirely mechanical and efficient in drilling many holes within a given time.

Although one embodiment of the invention has been herein illustrated and described, it will be evident to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

I claim:

1. In a machine for drilling holes in mine roofs and the like, a chassis mounted on wheels front and rear, a drill guide consisting of a pair of uprights with a cross-frame at the top, on the front end of the chassis frame with the center of the pivot in the same horizontal plane as the axis of the front chassis wheels but spaced from the bottom end of the uprights a distance whereby when the uprights are vertically disposed the front wheels are raised above the floor, drill guide supports having rods for supporting the drill guide in vertical or tilted position, means for locking and unlocking the drill guide supports, a carriage mounted on said uprights for sliding movement thereon, means for raising and lowering the carriage, a drill socket mounted on said carriage and a motor on said carriage for rotating the drill socket, said uprights having a channel shaped cross section comprising a web and parallel flanges, a plurality of wheels mounted on said carriage, some of said wheels having vertical rolling engagement with the outer surface of the web of each of such channels and other of said wheels having vertical rolling engagement with a flange of each of said channels.

2. In a machine for drilling holes in mine roofs and the like, a chassis mounted on wheels front and rear, a drill guide consisting of a pair of uprights with an upper cross-frame at the top and a lower cross frame on the

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front end of the chassis frame with the center of the pivot in the same horizontal plane as the axis of the front chassis wheels but spaced from the bottom end of the uprights a distance whereby when the uprights are vertically disposed the front wheels are raised above the floor, drill guide supports having rods for supporting the drill guide in vertical or tilted position, means for locking and unlocking the drill guide supports, a carriage mounted on said uprights for sliding movement thereon, means for raising and lowering the carriage, a drill socket mounted on said carriage and a motor on said carriage for rotating the drill socket, said carriage raising and lowering means comprising a hydraulic jack mounted on the lower cross-frame of said uprights, said jack having a sheave wheel and a cable looped over said wheel and fastened at one end to said carriage and at its other end to the cross-frame at the bottom of said uprights, said uprights having a channel shaped cross section comprising a web and parallel flanges, a plurality of wheels mounted on said carriage, some of said wheels having vertical rolling engagement with the outer surface of the web of each of such channels and other of said wheels having vertical rolling engagement with a flange of each of said channels.

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