Aug. 29, 1950 A. FEUCHT 2,520,390

PORTABLE DRILL RIG

Filed Nov. 22, 1944 4 Sheets-Sheet 1

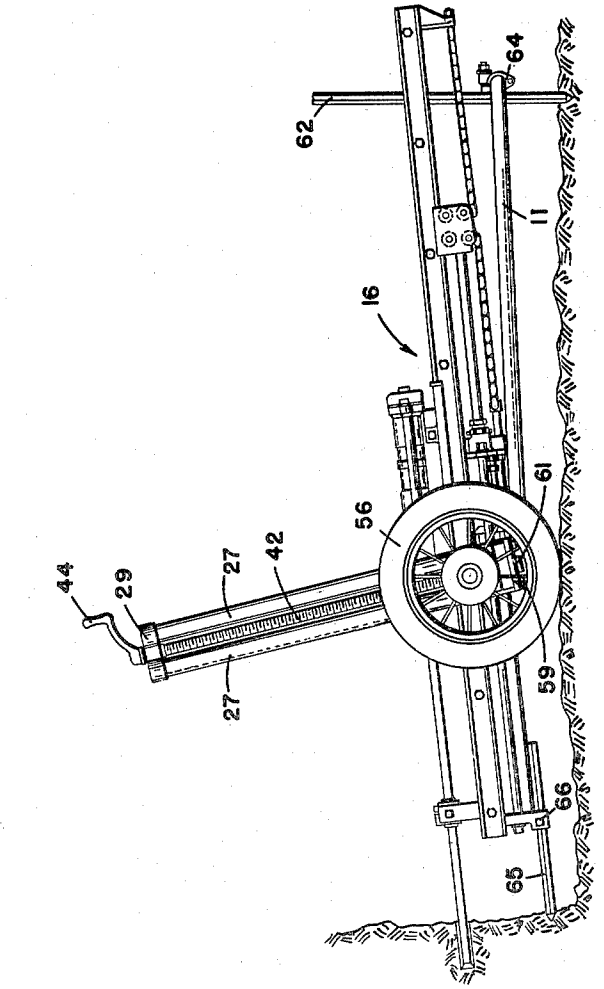


FIG. 2

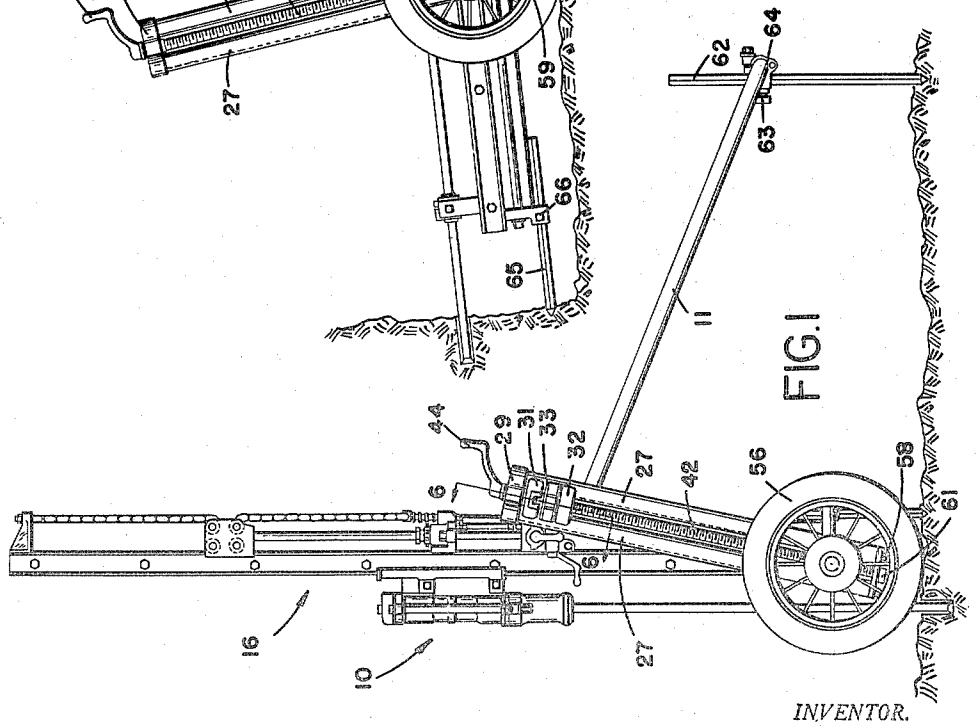


FIG. 1

INVENTOR.
ALBERT FEUCHT
BY
ATTORNEY

Aug. 29, 1950 A. FEUCHT 2,520,390

PORTABLE DRILL RIG

Filed Nov. 22, 1944 4 Sheets-Sheet 2

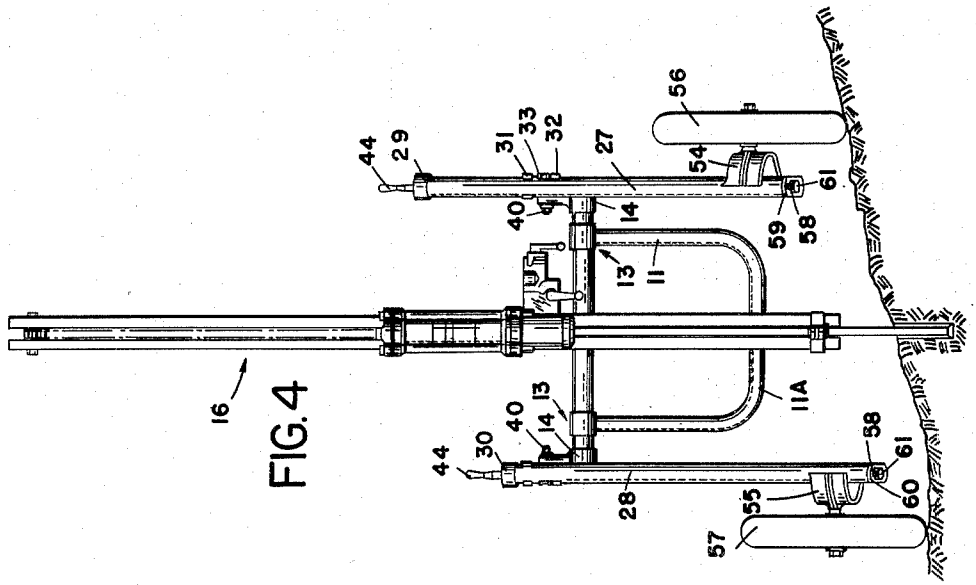


FIG. 4

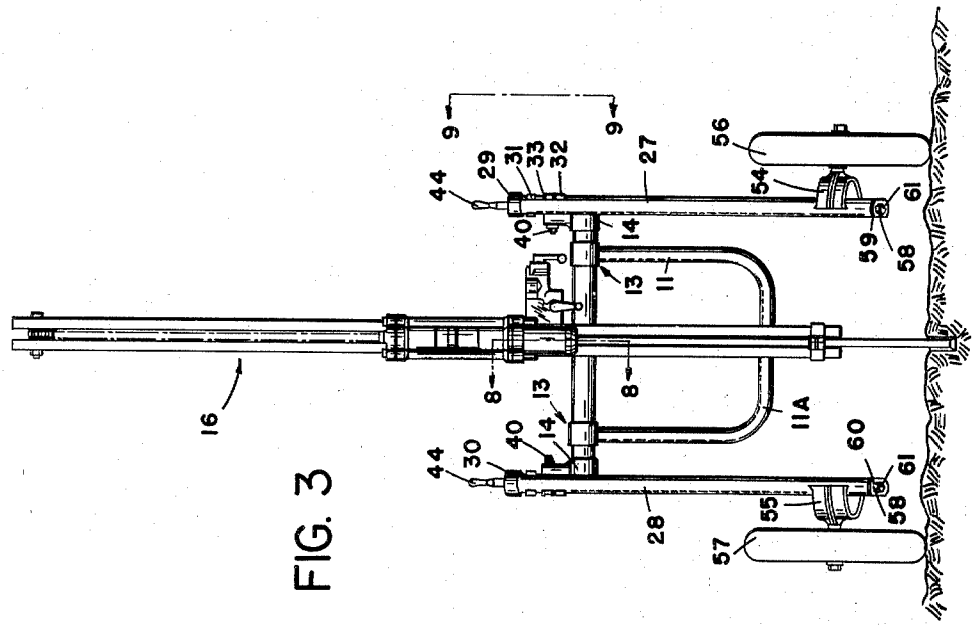


FIG. 3

INVENTOR.
ALBERT FEUCHT

BY

ATTORNEY

Aug. 29, 1950 A. FEUCHT 2,520,390

PORTABLE DRILL RIG

Filed Nov. 22, 1944 4 Sheets-Sheet 3

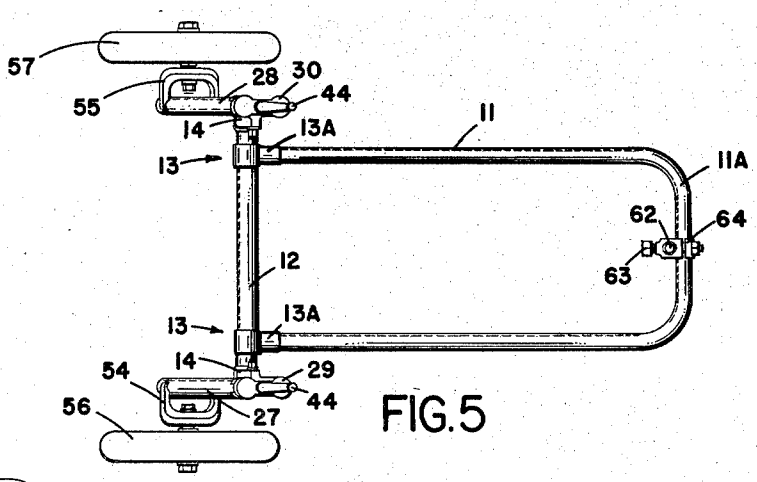


FIG.5

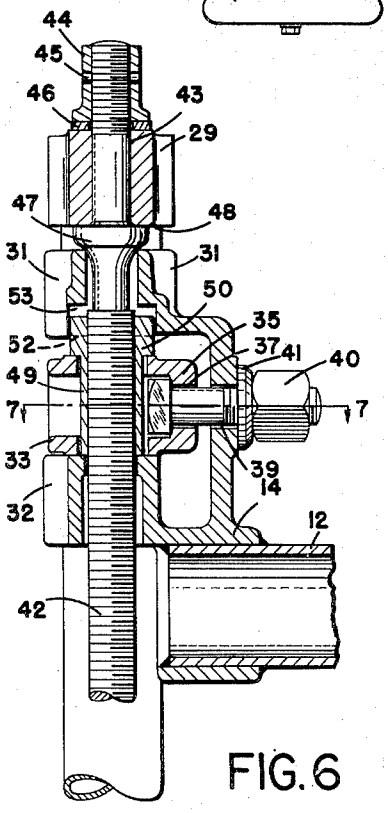


FIG.6

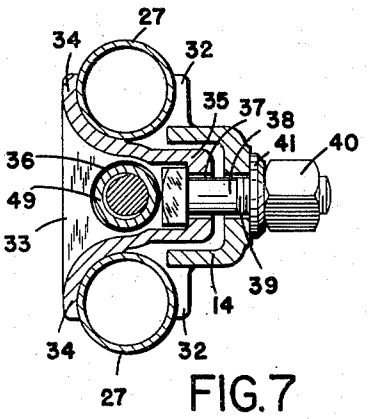


FIG.7

INVENTOR.
ALBERT FEUCHT

BY

ATTORNEY

Aug. 29, 1950 A. FEUCHT 2,520,390

PORTABLE DRILL RIG

Filed Nov. 22, 1944 4 Sheets-Sheet 4

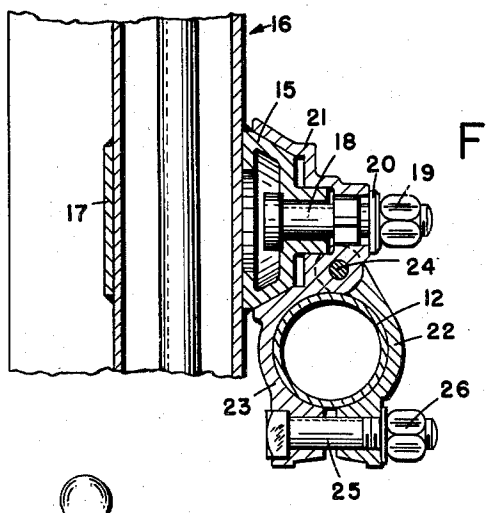


FIG. 8

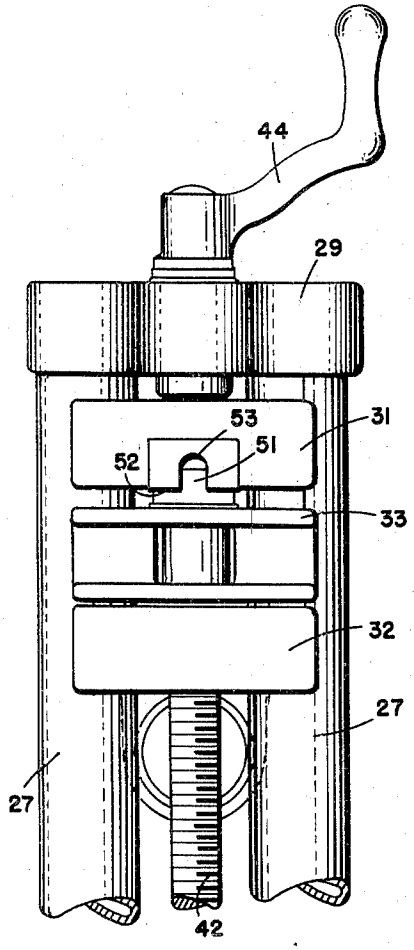


FIG. 9

INVENTOR.
ALBERT FEUCHT

BY

ATTORNEY

Patented Aug. 29, 1950

2,520,390

UNITED STATES PATENT OFFICE

2,520,390

PORTABLE DRILL RIG

Albert Feucht, Garfield Heights, Ohio, assignor, by mesne assignments, to Le Roi Company, Milwaukee, Wis., a corporation of Wisconsin

Application November 22, 1944, Serial No. 564,583

7 Claims. (Cl. 255—51)

1

The present invention relates to a new and improved portable drill rig and more particularly to an improved mounting for a rock drill feeding mechanism.

An important object of the invention is to provide an adjustable support for a rock drill in which a relatively heavy member of a rigid and otherwise light-weight frame supporting the rock drill is slidably mounted on relatively heavy side members or housings, the latter carrying wheels for rendering the device readily portable.

Another object is to provide a novel and improved portable rig for a rock drill so constructed and arranged that the drill or the mount therefor can be adjusted vertical with but slight longitudinal movement of the center of gravity of the rig relative to the points of support under the wheels. In the prior art devices, vertical movement of the rock drill feed was accompanied by such longitudinal movement of the center of gravity of a rig to a degree requiring the employment of relatively heavy frame members to counteract it.

A further object of the invention is to provide a support for a rock drill feed that is easily and readily movable to any position and one which can be used for vertical or horizontal drilling regardless of the slope of the ground.

Other objects and novel features of the invention will appear more fully hereinafter from the following detailed description when taken in connection with the accompanying drawings.

In the drawings,

Figure 1 is a side elevational view illustrating the drill rig in position for drilling a vertical hole;

Figure 2 is a side elevational view illustrating the drill rig in position for drilling a horizontal hole;

Figure 3 is a front elevational view of the device as used in Figure 1;

Figure 4 is a front elevational view of the device as used on an uneven surface;

Figure 5 is a top plan of the support with the drill removed therefrom;

Figure 6 is a vertical sectional view taken substantially on line 6—6 of Figure 1;

Figure 7 is a horizontal sectional view taken substantially on line 7—7 of Figure 6;

Figure 8 is a fragmentary sectional view through the drill supporting means, being taken substantially on line 8—8 of Figure 3; and

Figure 9 is an enlarged fragmentary side elevational view looking in the direction of the arrows 9—9 of Figure 3.

Referring to the drawings for a more detailed description thereof, the means for supporting the

2

rock drill, generally designated by the reference numeral 10, consists of a frame, generally designated by the reference numeral 11, which includes a substantially U-shaped member 11A and a transverse member or cross bar 12. The cross bar 12 carries near each end thereof a T-shaped fitting 13 which includes a sleeve 13A in which is received each leg of the frame member 11A, as shown in Figure 5 of the drawings. The fitting 13 is welded or otherwise secured to both the frame member 11A and the cross bar 12 to form a rigid frame.

As is to be understood, the rock drill 10 which is of conventional construction, is adjustably supported on the cross bar 12 of the frame 11, the means of attachment being shown in Figure 8 of the drawings. This means comprises a cone-shaped member 15 carried by and forming a part of the drill guiding means 16 by means of a band 17 encircling said means. Extending from the cone-shaped member 15 is a lock bolt 18 carrying a lock nut 19 and thrust washer 20, the nut 19 and washer 20 bearing against the female cone-shaped member 21 for frictionally seating the male cone 15 against the female cone 21. This entire assembly is in turn fixed to the cross bar 12 by means of the clamping arms 22 and 23 which are pivotally connected at 24 to the female cone member and locked on said cross bar 12 by means of the bolt and nut 25 and 26, respectively. It is to be understood that the guide means 16 and its associated members can be rotated relatively to the cross bar 12 and moved axially thereof upon loosening the nut 26. Tightening said nut will securely clamp the arms 22 and 23 to lock the guide means in its adjusted position. The means of supporting the rock drill including the guiding means 16, forms no part of the present invention and any other means for supporting the drill can be employed.

In accordance with the present invention, a means has been provided for raising and lowering the front end of the frame 11 including the cross bar 12 and its associated mechanisms to properly position the drill and rig to make the device readily useable regardless of the formation of the terrain with which it is associated. This means includes spaced, generally vertical elongated side members or housings comprising twin support tubes 27 and 28 positioned at each end of the cross bar 12 and connected thereto by the members 14 which are welded or otherwise rigidly secured to said cross bar. The upper ends of the tubes 27 and 28 are closed by caps 29 and 30 respectively and are held rigidly parallel to each

other by means of these caps which are welded or otherwise secured thereto.

That portion of the member 14 extending vertically from the frame cross bar 12 is formed with spaced sleeves or guide yokes 31 and 32 of arcuate shape to permit them to slide relative to the tubes 27. In the succeeding portion of this description there will only be described the details of construction of the member 14 positioned on one end of the cross bar 12, but it is to be understood that both members are identical in construction and are connected to the twin tubes 27 and 28 in a like manner.

Between the yokes 31 and 32 of the member 14 there is positioned a slide clamp 33 having a pair of arcuate-shaped clamping surfaces 34, which conform with the cylindrical surface of the tubes 27. Thus the tubes are held between the arcuate-shaped portions of the yokes 31 and 32 and the slide clamp 33. This slide clamp is formed with a central boss portion 35 in which there is formed a vertical bore 36 and a horizontal bore 37. A bolt 38 extends from the boss 35 through the bore 37 and through a bore 39 in the member 14, the bores 37 and 39 being in alignment. A nut 40 and thrust washer 41 are mounted on the bolt 38 exteriorly of the member 14 and when tightened, securely fasten the clamp 33 in engagement with the tubes 27.

Vertically extending between the twin tubes 27, there is an adjusting screw 42 adapted to be actuated for raising or lowering the front end of the frame 11 including the cross bar 12, member 14 and its associated mechanism relative to the tubes 27. The upper end of this screw extends through an opening 43 formed centrally of the cap 29 and projects beyond said cap, the projecting end having attached thereto a crank arm 44. The crank arm is keyed or otherwise secured to the adjusting screw, as indicated at 45 and is spaced from the cap by means of a washer 46. The adjusting screw 42 is formed with an annular shoulder 47 which has bearing engagement with the lower face 48 of the cap 29, as clearly shown in Figure 6 of the drawings.

The means for raising and lowering the member 14 also includes an adjusting nut 49 which is carried within the vertical bore 36 of the clamp 33. The adjusting nut 49 has a cap 50 formed on its upper end which is positioned above the clamp 33, and the cap is in turn formed with transversely extending keys 51 above the lower surface 52 of the yoke 31 and receivable in a notch 53 formed in said yoke. This construction prevents rotation of the nut 49 as the screw 42 is rotated by means of the handle 44. In practice, the thread on the adjusting screw 42 is lefthanded and therefore clockwise rotation of the handle 44 will cause the adjusting screw nut 49 to move in a downward direction and, conversely, counter-clockwise rotation of the handle 44 will cause the nut to move upwardly.

When the nut 40 is loosened to free the clamp 33 from the twin tubes 27, the combined weight of the cross bar 12, the slide member 14, and the clamping members within it is then supported by the nut 49 on the threads of the adjusting screw 42, through the lower surface 52 of the yoke 31 resting upon the upper surface of the cap 50. As it is to be understood, the clamp 33 is slidably operated freely between the cap 50 and the lower guide yoke 32. It will readily be seen that upward movement of the nut 49 will be directly imparted to the slide member 14 and cross bar 12, and that downward movement of

the nut 49 will simply lower the member 14 and all the members which are supported by it. If, for any reason, there should be encountered resistance to downward movement of the member 14, positive pressure from the nut 49 would be immediately applied to said member through the action of the lower end of the nut 49 against the lower guide yoke 32, and therethrough to the member 14 and the cross bar 12 rigidly connected to it.

Welded or otherwise secured to the lower ends of the tubes 27 and 28 are the U-shaped clamps 54 and 55 respectively which carry axles on which are mounted the ground-engaging wheels 56 and 57, by means of which the rig is portable and can be readily moved from one drilling location to another in wheel-barrow fashion. When moving the rig, the frame 11 serves as handles to be engaged by the operator and the entire rig can be pushed or pulled with the wheels 56 and 57 acting as traction members.

Secured to the very ends of the twin support tubes 27 and 28 by means of bolts 58 there are the adjusting screw supports 59 and 60 respectively, each of which is formed with a central boss 61 intermediate the ends thereof, in which is suitably journalled the lower end of the adjusting screw 42.

A stake or the like 62 held by set screw 63 is clamped by means 64 to the frame 11 and is adjustable relative to the frame for supporting it in various positions, as shown more particularly in Figures 1 and 2 of the drawings.

In the operation of this means of support for the frame 11, when the rig is changed from a position for horizontal drilling as shown in Figure 2 to a position for vertical drilling as shown in Figure 1 or 4, it is only required to release the set screw 63 and clamping means 64 to bring about the necessary adjustment. A similar stake 65 is clamped by a set screw 66 at the front end of the drill guiding means 16 and serves to steady the front end of said guiding means when the drill is in operation. Adjustment of these stakes is thought to be readily obvious, and since they form no part of the present invention a description of their operation is not thought necessary.

To free the clamping members within the slide member 14 from their grip on the vertical tubes 27 and 28, the nut 40 is loosened with a wrench, after which the crank arm 44 is turned to rotate the adjusting screw 42 about its axis, the screw being held in the cap 29 between the washer 46 and the shoulder 47. Clockwise rotation of the crank arm 44 will cause downward movement and counter-clockwise rotation upward movement of the end of the cross bar 12 through the functioning of the adjusting screw nut 49 as described above. Adjustment of the position of the rig may be made by operating the handles 44 in unison, or by cranking first one side and then the other to move the ends of the cross bar a few inches at a time. The pitch of the thread on the adjusting screws 42 is nonreversible and permits the operator to leave one side of the adjusting mechanism unclamped while he is adjusting the other side. Following the desired adjustment of the cross bar 12 either up or down, it is positioned securely against vibration of the rig by tightening the clamp nut 40. The results of such action are best seen in Figure 7 wherein it will be noted that tightening of the nut 40 draws toward it the head of the bolt 38 and thereby the slide clamp 33. Pressure from the two

clamping surfaces 34 is directed toward the tubes 27.

When desiring to change the drill rig from the position shown in Figure 2 to one such as shown in Figure 1 or Figure 3, it is necessary to operate the pneumatic motor of the drill guiding means 16 to run the drill back on said guiding means and withdraw the drill steel from the hole. Following this, the set screw 66 must be loosened, and the stake 65 withdrawn from the work face where it has been embedded, in order to permit the drill guiding means 16 to be raised. Both slide clamp nuts 40 are then loosened to free the grip of the slide member 14 and its associated mechanism on the twin support tubes 27 in the manner mentioned above. Both handles 44 are then cranked counter-clockwise to raise the cross bar end of the frame until the upper slide yokes 31 approach the upper limit of their travel as shown in Figure 1, in which position the slide parts are then clamped by tightening the nuts 40. Elevation of the clamping means 64 on the stake 62 to the position shown in Figure 1 completes the adjustments of the frame and supporting members. The drill guiding means, which was not disturbed from its position relative to the frame 11 as shown in Figure 2, would then be up-tilted beyond the horizontal, and to move it to the position shown in Figure 1 or 3, it is merely necessary to loosen the clamp nut 26, pivot the entire drill guiding means about the cross bar 12 to the vertical position shown, and then tighten the nut 26.

It will be noted that in this present position, with the slide parts at the upper limits of their travel, the support tube assemblies or side housings will have been pivoted about the axles on the U-shaped clamps 54 and 55 from a position slightly overhanging the point of wheel support to a position slightly inside said point of support, and that the center of gravity of these assemblies or members will have shifted longitudinally of the frame 11 to a position slightly farther to the right of the point of wheel support than said center of gravity occupied in the setting shown in Figure 2. This change toward greater stability of the rig is, however, not excessive, for most of the weight of the rig continues to be supported by the wheels irrespective of whether the cross bar is low or high, or the drill guiding means is horizontal or vertical, and only nominal lifting pressure is required to support the far end of the frame near the stake 62.

To move the rig from level ground, such as shown in Figure 1, to sloping ground, such as shown in Figure 4, it is only necessary to grasp the frame 11 near the stake 62 and, by lifting and using this part of the frame as a handle, to roll the rig on the wheels 56 and 57 from one position to another. When the drill rig is thus placed sideways on a slope, the cross bar 12 will lie parallel to the slope and the rig will be tilted. In order to level up the rig as shown in Figure 4, the slide clamp nut 40 on the high side of the cross bar 12 is loosened and the crank arm 44 on this side is turned clockwise to lower that end of the cross bar until it becomes level. The slide clamp nut 40 is then tightened to lock the framework rigidly.

It will thus be seen that a simple and practical means has been provided for moving one or both ends of the cross bar 12 relative to the support tubes 27 and 28 for adjusting the drill rig for any type of work. The adjustment can be rapidly accomplished with a minimum amount of time and effort. The supporting means further provides for centering the drill in a manner to facilitate its transportation from one drilling location to another.

Although the foregoing description is necessarily of a detailed character, in order to completely set forth the invention, it is to be understood that the specific terminology is not intended to be restrictive or confining, and it is to be further understood that various rearrangements of parts and modifications of structural detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. In a portable rig for supporting a rock drill, the combination of: a drill supporting frame including a substantially U-shaped member and a cross bar; a pair of spaced, generally vertical side members adjacent to each end of said cross bar; a ground-engaging wheel connected to each pair of said side members adjacent to the lower ends thereof; connecting means between the ends of said cross bar and their adjacent pair of side members including guide yokes slidable on said side members; and means including an adjusting screw carried by each pair of said side members for effecting relative adjustment between the ends of said cross bar and side members in a direction longitudinal of said side members.

2. In a portable rig for supporting a rock drill, the combination of: a drill supporting frame including a substantially U-shaped member and a cross bar; a pair of spaced, generally vertical side members adjacent to each end of said cross bar; a ground-engaging wheel connected to each pair of said side members adjacent to the lower ends thereof; connecting means between the ends of said cross bar and their adjacent pair of side members including guide yokes slidable on said side members; means including an adjusting screw carried by each pair of said side members for effecting relative adjustment between the ends of said cross bar and side members in a direction longitudinal of said members, and means for locking the ends of said cross bar to their adjacent pair of side members selectively.

3. In a portable rig for supporting a rock drill, the combination of: a drill supporting frame including a cross bar; a pair of spaced, generally vertical side members adjacent to each end of said cross bar; a ground engaging wheel connected to each pair of said side members adjacent to the lower ends thereof; and connecting means between said cross bar and side members including a pair of guide yokes rigidly secured to each end of said cross bar slidably mounted on the pair of side members adjacent thereto, an adjusting screw carried by each pair of side members in operative engagement with a nut carried by each pair of said yokes for effecting relative adjustment between the ends of said cross bar and side members in a direction longitudinal of said side members.

4. In a portable rig for supporting a rock drill, the combination of: a drill supporting frame including a cross bar; a pair of spaced, generally vertical side members adjacent to each end of said cross bar; a ground engaging wheel connected to each pair of said side members adjacent to the lower ends thereof; and connecting means between said cross bar and side members including a pair of vertically spaced guide yokes rigidly secured to each end of said cross bar slidably mounted on the pair of side members adjacent thereto, and a clamp in the vertical

space between said yokes operatively engageable with said side members for fixedly securing said cross bar to said side members.

5. In a portable rig for supporting a rock drill, the combination of: a frame including a drill supporting cross bar; a generally vertical stanchion adjacent to each end of said cross bar, said stanchions each including twin support tubes spaced transversally relative to said cross bar; a ground engaging wheel connected to each stanchion adjacent to the lower end thereof; connecting means between said cross bar and stanchions including a guide rigidly secured to each end of said cross bar slidably mounted on the stanchion adjacent thereto; and an adjusting screw carried by each stanchion in operative engagement with a nut carried by each guide for effecting relative adjustment between the ends of said cross bar and stanchions in a direction longitudinally of said stanchions.

6. In a portable rig for supporting a rock drill, the combination of: a frame including a drill supporting cross bar; a generally vertical stanchion adjacent to each end of said cross bar, said stanchions including twin support tubes spaced transversally relative to said cross bar, a clamp rigidly securing the lower ends of said tubes to each other; a ground engaging wheel operatively carried by said clamp; connecting means between said cross bar and stanchions including a guide rigidly secured to each end of said cross bar slidably mounted on the stanchion adjacent thereto; and an adjusting screw carried by each stanchion in operative engagement with a nut carried by each guide for effecting relative adjustment between the ends of said cross bar and stanchions in a direction longitudinally of said stanchions.

7. In a portable rig for supporting a rock drill, the combination of: a frame including a drill supporting cross bar; a generally vertical stanchion adjacent to each end of said cross bar, said stanchions including twin support tubes spaced transversally relative to said cross bar, a clamp rigidly securing the lower ends of said tubes to each other, a cap rigidly securing the upper ends of said tubes to each other; a ground engaging wheel operatively carried by said clamp; connecting means between said cross bar and stanchions including a guide rigidly secured to each end of said cross bar slidably mounted on the stanchion adjacent thereto; and an adjusting screw carried by said cap in operative engagement with a nut by said guide for effecting relative adjustment between the ends of said cross bar and stanchions in a direction longitudinally of said stanchions.

ALBERT FEUCHT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
318,865	Burgess et al.	May 26, 1885
999,123	Pennington	July 25, 1911
1,219,150	Raney et al.	Mar. 13, 1917
2,174,415	Curtis	Sept. 26, 1939