Sept. 26, 1939. J. C. CURTIS 2,174,415

ROCK DRILLING RIG

Filed Feb. 28, 1938 2 Sheets-Sheet 1

Fig. 1.

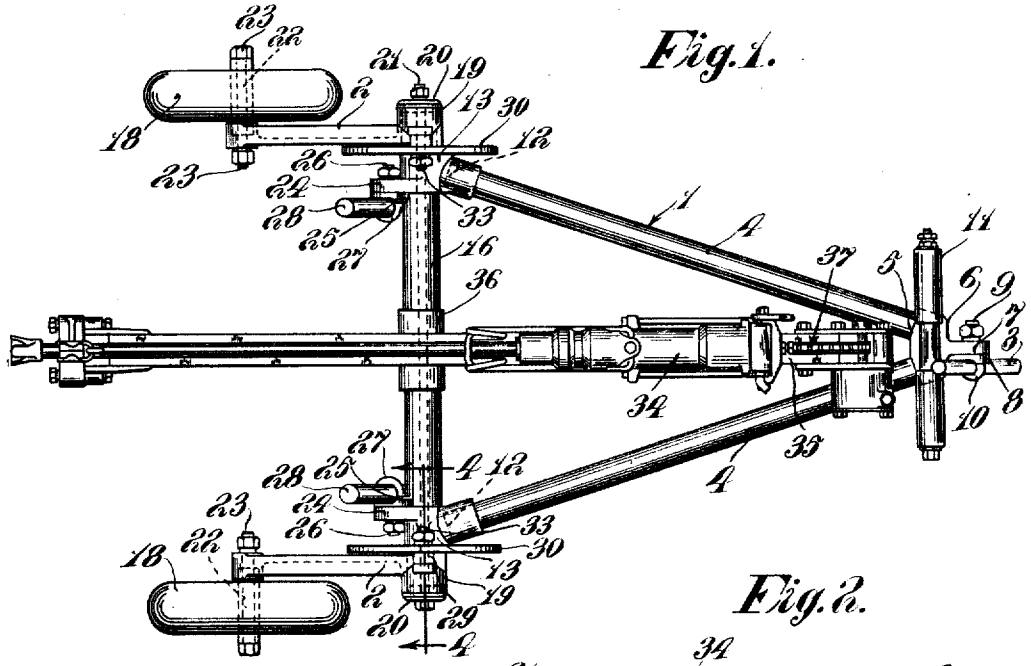


Fig. 2.

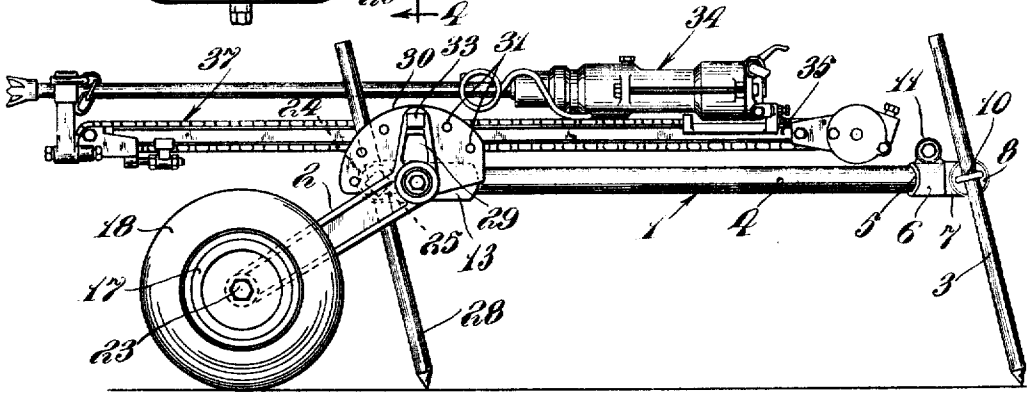
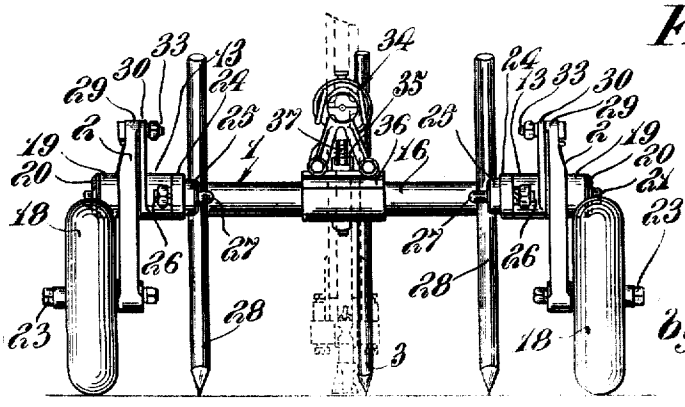


Fig. 3.



Inventor:
John C. Curtis.
by Louis A. Maxson
Atty.

Sept. 26, 1939. J. C. CURTIS 2,174,415

ROCK DRILLING RIG

Filed Feb. 28, 1938 2 Sheets-Sheet 2

Fig. 4.

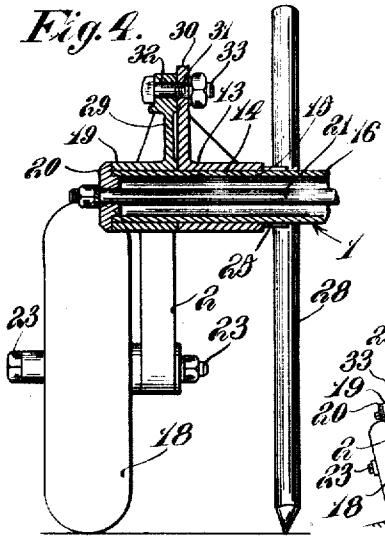


Fig. 5.

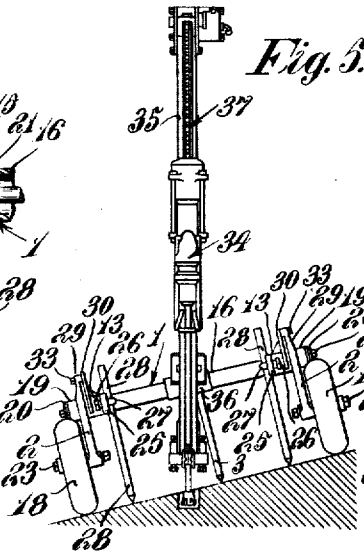


Fig. 6.

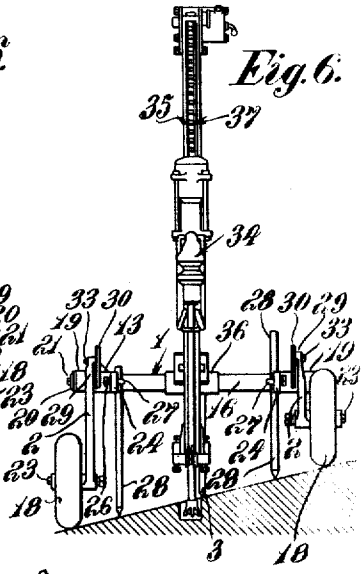


Fig. 7.

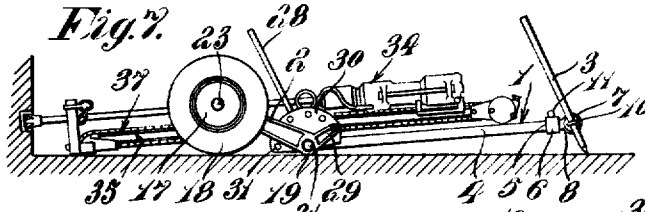


Fig. 8.

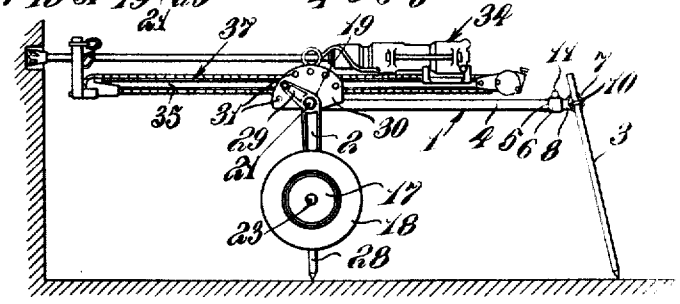
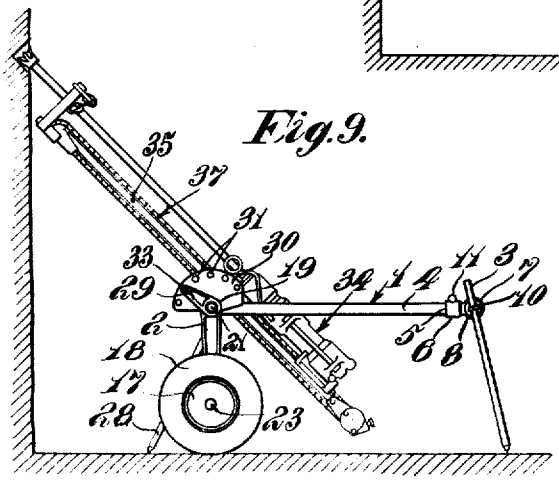


Fig. 9.



Inventor:
John C. Curtis.
By Louis A. Marson,
Atty.

Patented Sept. 26, 1939 2,174,415

UNITED STATES PATENT OFFICE

2,174,415

ROCK DRILLING RIG

John C. Curtis, Claremont, N. H., assignor to Sullivan Machinery Company, a corporation of Massachusetts

Application February 28, 1938, Serial No. 192,903

6 Claims. (Cl. 255—51)

This invention relates to portable drilling rigs, and more particularly to an improved portable drilling rig for a hammer rock drill whereby the latter may be supported through a wide range of positions with respect to the work and readily transported from place to place.

An object of this invention is to provide an improved portable drilling rig. Another object is to provide an improved portable drilling rig for a hammer rock drill whereby the latter may be supported through a wide range of drilling positions. A further object is to provide an improved portable drilling rig which is not only extremely rugged and durable in construction, but also relatively simple in design and light in weight. Other objects and advantages of the invention will, however, hereinafter more fully appear.

In the accompanying drawings there is shown for purposes of illustration one form which the invention may assume in practice.

In these drawings—

Fig. 1 is a top plan view of the improved drilling rig, showing a hammer rock drill mounted in a horizontal drilling position thereon.

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

Fig. 3 is a front end elevational view of the improved drilling rig, the vertical drilling position of the drill being indicated in dotted lines.

Fig. 4 is a transverse vertical sectional view taken on line 4—4 of Fig. 1.

Figs. 5 and 6 are diagrammatic end elevational views, showing the drilling rig supported in drilling position on an inclined surface or side hill.

Fig. 7 is a diagrammatic side elevational view, showing the drilling rig in a "snake-hole" drilling position.

Fig. 8 is a diagrammatic side elevational view of the drilling rig in a "breast" drilling position.

Fig. 9 is a diagrammatic side elevational view of the drilling rig in an "up-hole" drilling position.

In this illustrative embodiment of the invention, there is shown a portable drilling rig for a hammer rock drill, generally comprising a carriage frame or chassis 1 supported by independently adjustable wheeled legs 2, 2 and an adjustable anchor pin 3. The carriage frame is of generally V-shape in plan and consists of tubular side members 4, 4 converging rearwardly and secured at 5, at their rear ends, within a connecting bracket 6. Integral with this bracket is a clamp projection 7, with which a swiveled clamp 8 cooperates, said clamps being held in clamping engagement by a clamping bolt 9. This clamping bolt has an eye portion 10 receiving the anchor pin 3. By loosening the bolt 9, the anchor pin may be swivelled into different angular positions about a transverse axis and may be adjusted axially with respect to the bolt eye, and thereafter firmly clamped in position simply by tightening the bolt. Secured to the bracket 6 is a transverse handle 11 whereby the operator may conveniently push or drag the drilling rig on its supporting wheels from one working place to another. The forward, widely spaced, diverging ends of the tubular side members 4, 4 are secured at 12 within brackets 13, 13, and fixed at 14 within bores 15 within these brackets and extending transversely of the carriage frame at its forward end, is a tubular supporting member 16, the ends of the latter projecting laterally from the ends of the brackets 13, 13, as clearly shown in Fig. 4. The parts 4, 6, 13 and 16 cooperate to form the carriage frame or chassis 1.

In this improved construction, pivotally mounted on the projecting ends of the transverse member 16 on alined axes coincident with the longitudinal axis of the transverse member, are the wheeled legs 2 carrying wheels 17 provided with pneumatic tires 18. The wheeled legs 2 have hubs 19 swivelled on the projecting ends of the transverse tubular member 16 and retained thereon by retaining caps 20 held in place by a tie-bolt 21 extending centrally through the tubular supporting member 16, as illustrated. The wheels 17 are journaled at 22, in a conventional manner, within the axle portions of the pivoted legs, and are held in position on their axles by bolts 23. The front brackets 13 each have an integral forward clamp projection 24 with which cooperates a swivelled clamp 25 held in clamping relation by a bolt 26. This bolt has an eye portion 27 receiving an anchor pin 28. When the bolts 26 are loosened, the anchor pins 28 may be swiveled about a transverse axis and adjusted axially with respect to the bolt eyes, and may be clamped firmly in position simply by tightening the bolts.

As above mentioned, the front supporting legs 2, 2 of the carriage frame or chassis are independently adjustable in a vertical direction about their pivotal axes, and for locking the legs in their adjusted position there are provided projections 29 integral with each leg and cooperating with segmental flanges 30 integral with the brackets 13, respectively. The segmental flanges are each provided with a series of per-

forations 31 with which a perforation 32 in each projection 29 is adapted to register, and locking bolts 33 may be passed through the registering perforations firmly to lock the parts in position. If desired, instead of the cooperating bolt and perforated flange type lock, other known types of locks may be employed, for instance, a lock of the gear segment type or a friction lock. The independent vertical adjustment of the front carriage legs is particularly desirable when the drilling rig is operating on an uneven or inclined surface, as will later be explained.

The transverse tubular member 16 provides a support for a conventional hammer rock drill generally designated 34, and, in this instance, a drill guiding frame 35 having a usual swivelled trunnion mounting 36 is adjustably supported by the transverse member. The trunnion mounting 36 is in the form of a clamp and may be adjusted in a known manner angularly and laterally back and forth along the transverse supporting member 16 and may be swivelled relative to the latter to permit adjustment of the drill guiding frame in various drill guiding positions with respect to the work. An automatic endless chain and sprocket, ratchet-controlled type feed, generally designated 37, controlled by the vibratory action of the hammer motor, is provided for effecting automatic feed of the rock drill relative to the drill guide frame during the drilling operation. It will be evident, however, that the rock drill may be fed along the drill guide frame in any conventional manner, as is well understood by those skilled in the art.

The mode of operation of the improved drilling rig will be clearly apparent from the description given: During vertical drilling on an inclined supporting surface, such as a side hill, the carriage frame may be supported with the tubular supporting member 16 in an inclined position substantially parallel with the supporting surface, in the manner shown in Fig. 5, or the wheeled supporting legs 2 may be independently vertically adjusted to support the tubular supporting member 16 in the horizontal position shown in Fig. 6; and in either of these supporting positions, the drill guiding frame 35 may be adjusted and clamped in the vertical position shown, so that as the rock drill 34 is fed longitudinally along the drill guiding frame, vertical holes may be drilled in the working face. During "snake-hole" drilling, the wheeled supporting legs 2 may be adjusted into the position shown in Fig. 7, with the carriage frame resting at its forward end directly on the ground surface with the drill guiding frame 35 in a substantially horizontal position near the ground surface. In Fig. 8, the drilling rig is shown in a position for drilling "breast" holes, and the wheeled supporting legs 2 and rear anchor pin 3 are adjusted in the position shown, with the drill guiding frame in a substantially horizontal position. During "up-hole" drilling, the wheeled supporting legs 2 and rear anchor pin 3 are adjusted in the position shown in Fig. 9, with the drill guiding frame 35 in an upwardly inclined position with respect to the working face. By the provision of the independent adjustment of the front supporting wheels, the drilling rig may be supported on an uneven or inclined surface with the supporting wheels at different elevations, a feature the desirability of which will be clearly evident to those skilled in the art. In any of the above described positions of the drilling rig, the front anchor pins 28, 28 may be adjusted to steady the drill, and, as shown in Fig. 8, the carriage frame may be entirely supported by the anchor pins 3 and 28. Also, the drill guiding frame may be adjusted angularly and laterally relative to the transverse supporting member 16, as desired. When it is desired to transport the drilling rig, the wheels are locked in the position shown in Fig. 2 and the operator grasps the handle 11, to either push or pull the rig on its supporting wheels.

As a result of this invention, it will be noted that an improved portable drilling rig is provided which is not only rugged and durable in construction, but which is also relatively simple in design and light in weight. It will further be noted that by the provision of the independently vertically adjustable, wheeled supporting legs, the drilling rig may be supported on an uneven or inclined surface in an improved manner. It will further be evident that, due to the relatively simple construction, the drilling rig may be readily transported from place to place and adjusted by a single operator. Other manners of use and advantages of the improved drilling rig will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form 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 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. A rock drill rig comprising, in combination, a carriage frame comprising horizontal side frame members, a transverse support extending horizontally between said side frame members at one end of the carriage frame, a drill guide swivelly mounted on said transverse support to swing in vertical planes extending longitudinally of the carriage frame, a ground-engaging member supporting the end of the carriage frame remote from said transverse support, wheel arms swivelly mounted on the sides of said carriage frame at the opposite end of said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having wheel axles and ground-engaging transport wheels respectively journaled on said axles, and means for securing said wheel arms in different vertically adjusted positions about their swivel axes with respect to said carriage frame.

2. A rock drill rig comprising, in combination, a carriage frame generally triangular in plan and including relatively inclined, horizontal side frame members, a transverse support extending horizontally between the widely spaced ends of said side frame members, a drill guide swivelly supported by said transverse member to swing in vertical planes extending longitudinally of said carriage frame, a ground-engaging support for said carriage frame at the converging ends of said side frame members, a pair of ground-engaging transport wheels at the wider end of said carriage frame, and independently vertically adjustable arms pivotally mounted to swing relative to said carriage frame on axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled.

3. A rock drill rig comprising, in combination, a carriage frame generally triangular in plan and including relatively inclined, horizontal side

frame members, a transverse support extending between the widely spaced ends of said side frame members, a drill guide swivelly supported by said transverse support to swing in vertical planes extending longitudinally of said carriage frame, a ground-engaging support for said carriage frame at the converging ends of said side frame members, a pair of ground-engaging transport wheels at the widely spaced ends of said side frame members of said carriage frame, independently vertically adjustable arms pivotally mounted to swing relative to said carriage frame on axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, and means for securing said arms in their different vertically adjusted positions about their pivots with respect to said carriage frame comprising segmental vertical flanges respectively secured to said side frame members and having a series of equidistantly spaced, radially located perforations with which perforations in said arms are adapted to register, and bolts insertable through the registering apertures for securing said arms to said flanges.

4. A rock drill rig comprising, in combination, a carriage frame having horizontal side frame members connected together at one end of the carriage frame, a transverse support extending horizontally between said side frame members at the opposite end of said carriage frame, a drill support swivelly mounted on said transverse support to swing in vertical planes extending longitudinally of said carriage frame, a ground-engaging supporting member adjustably mounted on said carriage frame at the connected ends of said side frame members of said carriage frame for supporting said end of said carriage frame, a pair of ground-engaging transport wheels supporting said opposite end of said carriage frame, arms pivotally connected to said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, elements integral with said side frame members, and releasable means cooperating with said arms and said integral elements for locking said arms in their different positions of vertical adjustment about their swivel axes relative to said carriage frame.

5. A rock drill rig comprising, in combination, a carriage frame having horizontal side frame members connected together at one end of the carriage frame, a transverse support extending horizontally between said side frame members at the opposite end of said carriage frame, a drill guide swivelly mounted on said transverse support to swing relative to said carriage frame in planes extending longitudinally relative thereto about an axis coincident with the longitudinal axis of said transverse support and to swing laterally relative to said carriage frame about an axis arranged at right angles to said swivel axis, a ground-engaging supporting member adjustably mounted on said carriage frame at the connected end of said carriage frame for supporting said end of said carriage frame, a pair of ground-engaging transport wheels supporting said opposite end of said carriage frame, arms pivotally connected to said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, elements integral with said side frame members for locking said arms in their different positions of vertical adjustment about their swivel axes relative to said carriage frame.

6. A rock drill rig comprising, in combination, a carriage frame comprising horizontal side frame members, a transverse support extending horizontally between said side frame members at one end of the carriage frame, the ends of said support projecting laterally from the sides of said carriage frame, a drill guide swivelly mounted on said transverse support to swing in vertical planes extending longitudinally of the carriage frame, a ground-engaging member supporting the end of the carriage frame remote from said transverse support, wheel arms swivelly mounted on the laterally projecting ends of said transverse support at the opposite end of said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having wheel axles and ground-engaging transport wheels respectively journaled on said axles, and means for securing said wheel arms in different vertically adjusted positions about their swivel axes with respect to said carriage frame.

JOHN C. CURTIS.

CERTIFICATE OF CORRECTION.

Patent No. 2,174,415. September 26, 1939.

JOHN C. CURTIS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 25, claim 5, after "members" insert the comma and words --, and releasable means cooperating with said arms and said integral elements--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of July, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

frame members, a transverse support extending between the widely spaced ends of said side frame members, a drill guide swivelly supported by said transverse support to swing in vertical planes extending longitudinally of said carriage frame, a ground-engaging support for said carriage frame at the converging ends of said side frame members, a pair of ground-engaging transport wheels at the widely spaced ends of said side frame members of said carriage frame, independently vertically adjustable arms pivotally mounted to swing relative to said carriage frame on axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, and means for securing said arms in their different vertically adjusted positions about their pivots with respect to said carriage frame comprising segmental vertical flanges respectively secured to said side frame members and having a series of equidistantly spaced, radially located perforations with which perforations in said arms are adapted to register, and bolts insertable through the registering apertures for securing said arms to said flanges.

4. A rock drill rig comprising, in combination, a carriage frame having horizontal side frame members connected together at one end of the carriage frame, a transverse support extending horizontally between said side frame members at the opposite end of said carriage frame, a drill support swivelly mounted on said transverse support to swing in vertical planes extending longitudinally of said carriage frame, a ground-engaging supporting member adjustably mounted on said carriage frame at the connected ends of said side frame members of said carriage frame for supporting said end of said carriage frame, a pair of ground-engaging transport wheels supporting said opposite end of said carriage frame, arms pivotally connected to said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, elements integral with said side frame members, and releasable means cooperating with said arms and said integral elements for locking said arms in their different positions of vertical adjustment about their swivel axes relative to said carriage frame.

5. A rock drill rig comprising, in combination, a carriage frame having horizontal side frame members connected together at one end of the carriage frame, a transverse support extending horizontally between said side frame members at the opposite end of said carriage frame, a drill guide swivelly mounted on said transverse support to swing relative to said carriage frame in planes extending longitudinally relative thereto about an axis coincident with the longitudinal axis of said transverse support and to swing laterally relative to said carriage frame about an axis arranged at right angles to said swivel axis, a ground-engaging supporting member adjustably mounted on said carriage frame at the connected end of said carriage frame for supporting said end of said carriage frame, a pair of ground-engaging transport wheels supporting said opposite end of said carriage frame, arms pivotally connected to said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having axles on which said wheels are respectively journaled, elements integral with said side frame members for locking said arms in their different positions of vertical adjustment about their swivel axes relative to said carriage frame.

6. A rock drill rig comprising, in combination, a carriage frame comprising horizontal side frame members, a transverse support extending horizontally between said side frame members at one end of the carriage frame, the ends of said support projecting laterally from the sides of said carriage frame, a drill guide swivelly mounted on said transverse support to swing in vertical planes extending longitudinally of the carriage frame, a ground-engaging member supporting the end of the carriage frame remote from said transverse support, wheel arms swivelly mounted on the laterally projecting ends of said transverse support at the opposite end of said carriage frame for independent vertical swinging movement relative to said carriage frame about axes alined with the longitudinal axis of said transverse support and having wheel axles and ground-engaging transport wheels respectively journaled on said axles, and means for securing said wheel arms in different vertically adjusted positions about their swivel axes with respect to said carriage frame.

JOHN C. CURTIS.

CERTIFICATE OF CORRECTION.

Patent No. 2,174,415. September 26, 1939.

JOHN C. CURTIS.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 25, claim 5, after "members" insert the comma and words --, and releasable means cooperating with said arms and said integral elements--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of July, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)