

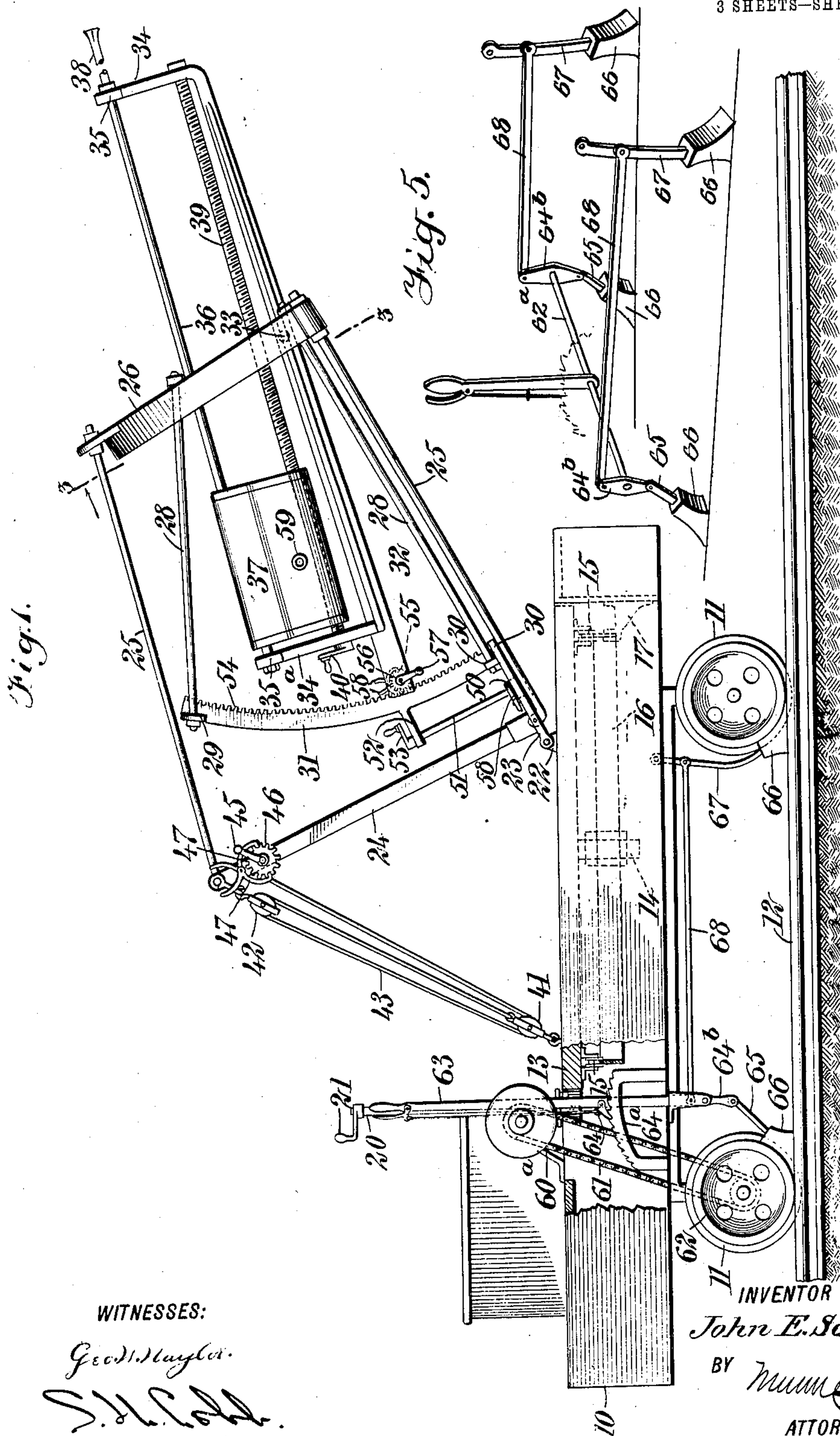
No. 828,684.

PATENTED AUG. 14, 1906.

J. E. SALES.  
ROCK DRILL.

APPLICATION FILED MAY 10, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

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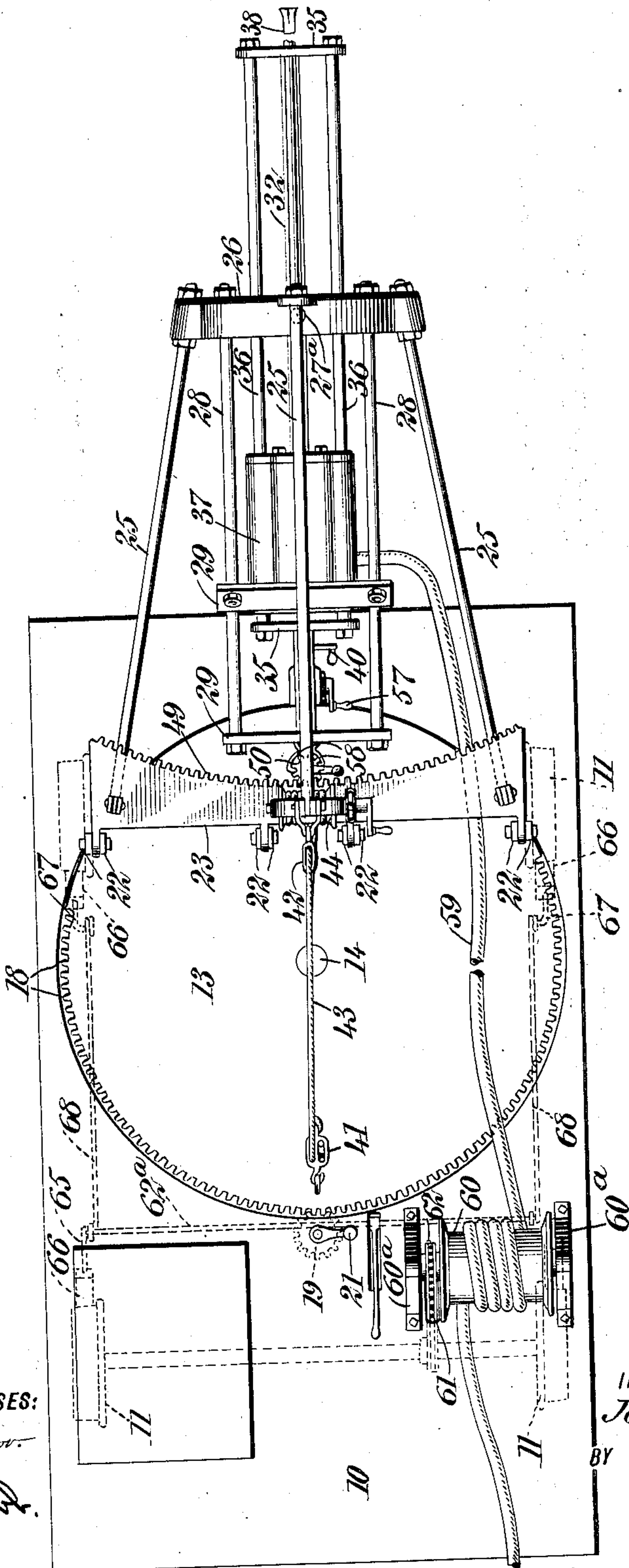
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3 SHEETS—SHEET 2.

Fig. 2.



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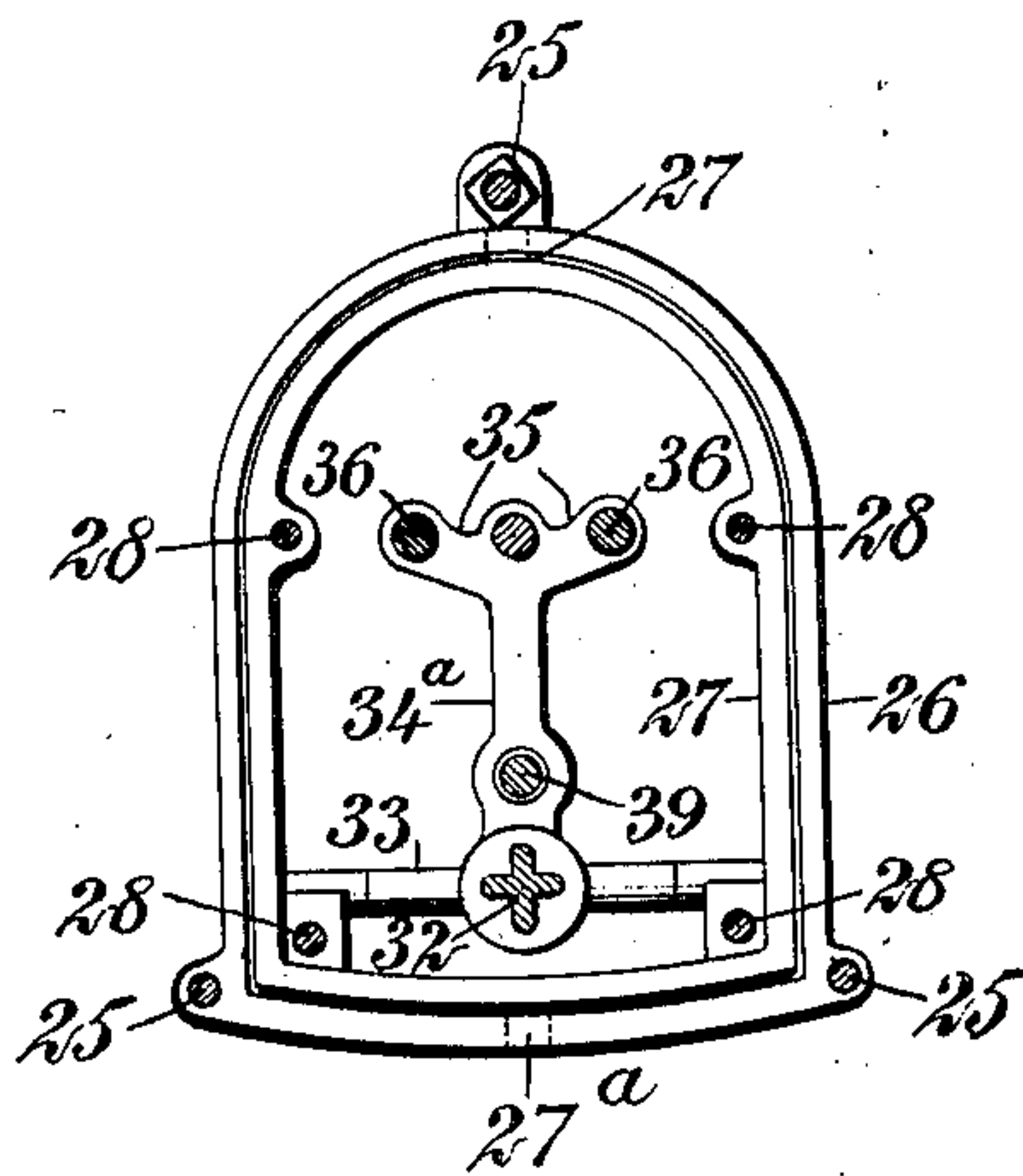
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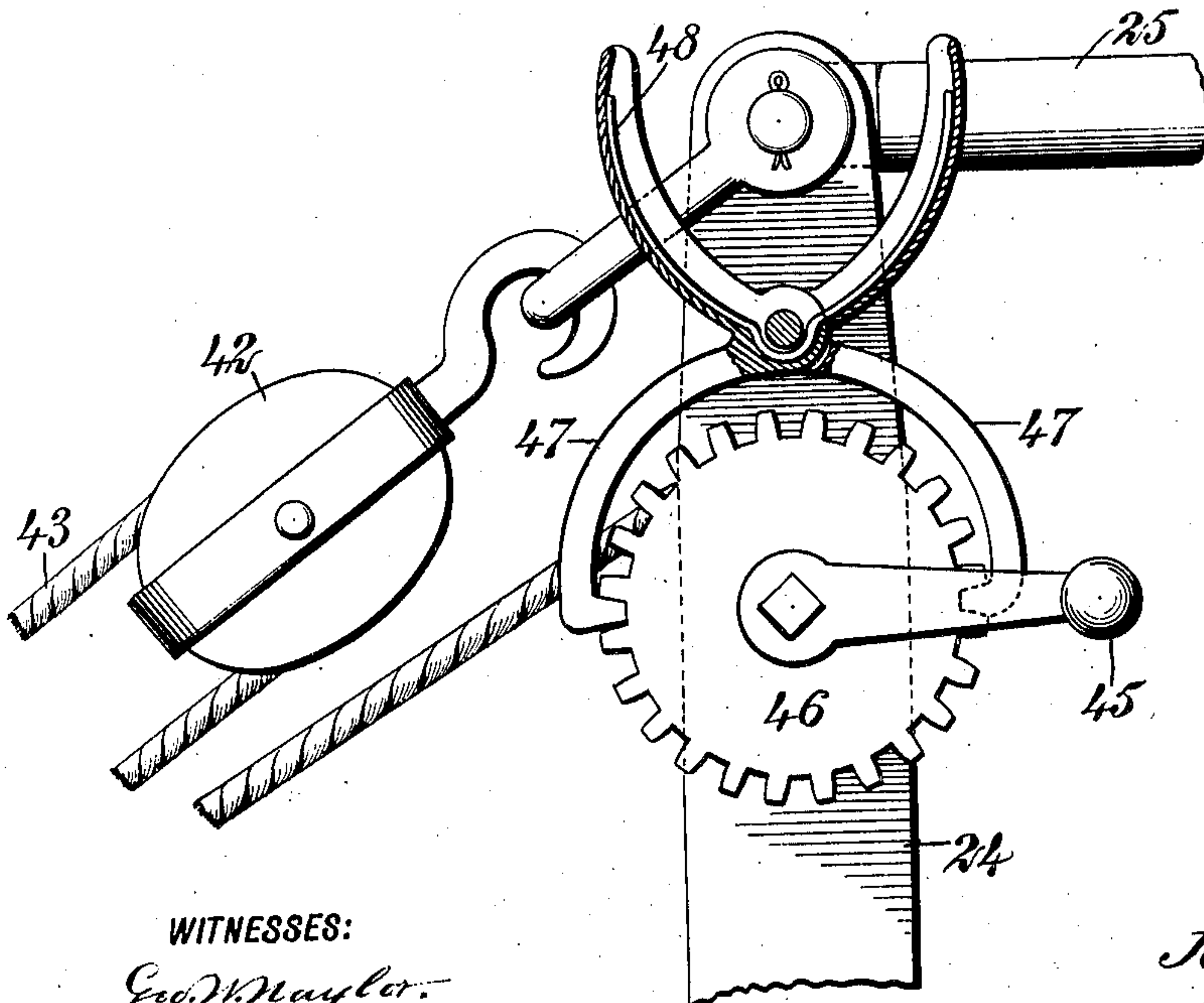
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3 SHEETS—SHEET 3.

*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

JOHN E. SALES, OF WRANGELL, DISTRICT OF ALASKA.

## ROCK-DRILL.

No. 828,684.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed May 10, 1905. Serial No. 259,740.

*To all whom it may concern:*

Be it known that I, JOHN E. SALES, a citizen of the United States, and a resident of Wrangell, in the District of Alaska, have  
5 invented a new and Improved Rock-Drill, of which the following is a full, clear, and exact description.

My invention relates to drills, and especially to those adapted for operating upon  
10 rock and like substances. Its principal objects are to provide such an apparatus which may be readily positioned and efficiently operated with a minimum number of attendants.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the  
15 views.

Figure 1 is a side elevation of one embodiment of my invention, parts being broken away. Fig. 2 is a top plan view thereof. Fig. 3 is a transverse sectional detail on the  
20 line 3 3 of Fig. 1. Fig. 4 is a detail in broken side elevation of the locking mechanism for the tackle, and Fig. 5 is a detail perspective view of the brake mechanism.

The apparatus is preferably supported upon a car 10, having wheels 11, adapted to  
30 run upon rails 12. In a circular opening in the top of the car is situated a turn-table having a central shaft 14 rotatable in a bearing upon the car, and rolls 15, mounted near its periphery and running upon a track 16, carried upon brackets 17 within the opening.  
35 The turn-table is shown as provided with peripheral teeth 18, with which mesh the teeth of a pinion 19, fixed upon a vertical shaft 20, rotatably mounted in the floor of the car and having a crank 21, by which it  
40 may be turned to rotate the table about its axis.

Upon the upper surface of the turn-table, between its center and circumference, are  
45 pairs of alined lugs 22 22, upon which is pivoted a main frame. This frame may comprise a carrier-bar 23, swinging upon the lugs and having a central upright 24, which includes spaced side bars connected at their  
50 upper extremities by an integral cross-bar. From the upper end of the upright and from the carrier-bar project rods 25, which support an open head 26. Upon this head is mounted a secondary frame, including an  
55 inner head 27, from the upper and lower sides of which project trunnions 27<sup>a</sup>, turning

in the head 26. From the inner head at its top and bottom toward the table project rods 28, which at their opposite extremities are connected to top and bottom cross-bars 29  
60 and 30, respectively, from a vertical connecting-bar 31. The secondary frame also includes a supporting-bar 32, having lateral trunnions 33 33 pivoted in the sides of the head 27 and permitting said supporting-bar  
65 to move in planes substantially at right angles to those in which the secondary frame may swing. Near the opposite ends of the supporting-bar are upward extensions 34 34<sup>a</sup>,  
70 from the top of which project lateral arms 35, connected by supporting-rods 36. These rods carry a casing 37, inclosing the motor or operating mechanism for the drill 38, which projects forwardly and is guided by the extension 34, in which it rotates. Extending  
75 through the casing and having threaded engagement therewith is a screw 39, which is journaled in the supporting-bar extensions and has at its inner end a crank 40, by which it may be rotated, this serving to move the  
80 motor-casing bodily along the supporting-rods, and thus advance or withdraw the drill.

The main frame may be swung upon its supporting-pivots by means of connections  
85 extending between the turn-table and the center upright, this conveniently consisting of tackle having blocks 41 and 42, supported upon eyes carried by the table and upright, respectively, over which blocks passes a rope  
90 43, fixed at one end to the block 41 and at the opposite extremity to a drum 44, rotatably mounted between the side bars of the upright. The spindle of this drum may be provided with a crank 45 and with a toothed  
95 wheel 46, with which wheel coacts locking mechanism which may comprise a pair of members 47 47, pivoted together upon the outside of one of the side bars and each having inwardly-extending projections to enter  
100 between the teeth, and thus hold the drum against rotation and the frame in its adjusted position. The engagement between the locking members and toothed wheel is preferably normally maintained by means  
105 of a spring 48, which passes inside the pivot-pin of the members and exerts its tension against them.

Means are provided for controlling the vertical and horizontal movements of the  
110 drill, these being secured by the swinging of the secondary frame and the supporting-bar



upon their trunnions. For this purpose the carrier-bar 23 has at its inner side a gear-segment 49, with which meshes a pinion 50, carried by a shaft 51, journaled in the cross-bar 30 and in a lug 52 from the inner side of the connecting-bar 31. The shaft has at its upper end a crank 53, by which it may be rotated to swing the secondary frame and drill horizontally. At the outer edge of the bar 31 is a gear-segment 54, in engagement with a pinion 55, fixed upon a shaft 56, journaled in the supporting-bar and having a crank 57. The turning of this crank effects a vertical movement of the drill by the swinging of the supporting-bar. Both the pinions 50 and 55 may be fixed in position to hold the drill in adjustment by locking members 58 58 coacting with the pinion-teeth and being similarly supported and operated to the members 47, previously described.

The drill-motor may be conveniently driven by compressed air, it having connected with it a hose or flexible transmitting means 59, extending from a suitable source of pressure. The slack of this hose may rest upon the car, it then passing about a drum 60, rotatably mounted upon standards 60<sup>a</sup>, projecting from the car-floor. The drum may be geared to one of the car-axles by a chain 61, passing over sprocket-wheels 62. As the car is moved the hose is thus automatically paid out or drawn in, obviating the necessity for handling it.

Secured to a rock-shaft 62<sup>a</sup> is shown a lever 63, which may be fixed in position by latch mechanism 64, coacting with a toothed sector 64<sup>a</sup>. To each end of the shaft is secured an arm 64<sup>b</sup>, the arm being secured to the shaft at its center of length to form oppositely-projecting members, and to the lower member of the arm is pivoted a link 65, which carries a brake-block 66, having converging faces which conform to the periphery of one of the car-wheels and to the track, these faces being preferably roughened to secure more effective frictional engagement. Upon an arm 67, pivoted upon each side of the car near the wheels at the opposite end, is carried a similar block, this arm and the upper member of the corresponding arm 64<sup>b</sup> being connected by a link 68, so that the two brake-blocks may be moved in unison. When these blocks are thrust between the rail and wheels by moving the lever rearward, the car is held against movement to allow the projection of the drill into the work. When desired, they may be quickly and readily released by swinging the lever in the opposite direction.

In use the car is pushed forward upon the rails to the face which is to be operated upon, the brakes applied, and an initial positioning secured by rotating the turn-table and swinging the main frame by means of its tackle, thus securing both a horizontal and a verti-

cal adjustment of the drill. Said drill at the beginning of the operation is drawn in or its motor-casing is at the inner ends of the supporting-bars, as is shown in Figs. 1 and 2 of the drawings. It is now advanced into the work by turning the crank of the screw, its length being sufficient to enable the hole to be drilled to its full depth without changing drills, this being only necessary in my improved apparatus when the working portions become dulled or it is desired to use a different length to meet special conditions. The first hole having been completed, the drill may be withdrawn by reversing the rotation of the screw, and then by means of the cranks 53 and 57 the secondary frame and supporting-bar are moved to bring the drill into position for making the next hole, when the boring is performed as before. In this manner the time necessary for changing the position of the whole drill structure, as is the common practice, is saved. When the work is completed, the brakes are released and the car pushed away to be run upon another spur of track for further operation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a rock-drill, a car, a turn-table on the car, a main frame pivoted to the turn-table, means for adjusting said frame, a secondary frame pivoted in the main frame to swing in a plane at right angles to the plane of movement of the said frame, means for adjusting the secondary frame, a supporting-bar pivoted in the secondary frame to swing in a plane at right angles to the plane of movement of the secondary frame, said bar carrying guide-rods, means for adjusting the supporting-bar, a motor mounted to slide on the guide-rods of the supporting-bar, and means for sliding the motor on said bars.

2. The combination with a support, of a main frame carried thereon and being provided with a gear-segment, a secondary frame pivoted upon the main frame and including a pivoted supporting-bar, means for adjusting said bar, a pinion journaled upon the secondary frame and coöperating with the gear, and a drill mounted upon the supporting-bar.

3. The combination with a support, of a main frame carried thereon and being provided with a gear-segment, a secondary frame pivoted upon the main frame and including a supporting-bar, a pinion journaled upon the secondary frame and coöperating with the gear, a lock for the pinion, and a drill mounted upon the supporting-bar.

4. The combination with a support, of a main frame carried thereon, a secondary frame pivoted upon the main frame and including a supporting-bar pivoted therein, a gear-segment carried by the secondary frame, a pinion journaled upon the support-



ing-bar and cooperating with the gear-segment, and a drill mounted upon the supporting-bar.

5 The combination with a support, of a main frame carried thereon, a secondary frame pivoted upon the main frame and including a supporting-bar, a gear-segment carried by the secondary frame, a pinion journaled upon the supporting-bar and co-  
10 operating with the gear-segment, a lock for the pinion, and a drill mounted upon the supporting-bar.

6. In a drill, a support, a main frame pivoted on the support to swing in a vertical  
15 plane, means for adjusting the frame, a secondary frame within the main frame and pivoted thereto to swing in a horizontal plane, means for adjusting the secondary frame, a supporting-bar pivoted intermedi-  
20 ate of its ends in the secondary frame to swing in a vertical plane, means for adjusting the said bar, a movable drill-operating motor mounted on the supporting-bar, and means  
25 for adjusting the motor forward and backward.

7. In a drill, a main frame, a secondary frame pivoted to the main frame to swing in a horizontal plane, a supporting-bar having at its ends upwardly-projecting members  
30 and pivoted intermediate of its ends in the secondary frame to swing in a vertical plane, guide-rods carried by the projecting members of the supporting-bar, a motor mounted to slide on the said guide-rods, and a screw  
35 mounted in the supporting-bar and engaging the motor.

8. In a drill, the combination with a support, of a main frame pivoted to the support and provided with a gear-segment, means for  
40 adjusting said frame, a secondary frame pivoted in the main frame, an adjustable drill-carrier mounted in the secondary frame, and a pinion mounted in the secondary frame and engaging the gear-segment.

45 9. In a drill, the combination with a support, of a main frame pivoted to the support, means for adjusting the frame, a secondary frame mounted in the main frame, means for adjusting the secondary frame, a gear-seg-

ment carried by the secondary frame, a drill- 50 carrier pivotally mounted in the secondary frame, and a pinion mounted on the drill-carrier and engaging the gear-segment.

10. In a drill, the combination with a support, of a main frame pivoted to the support 55 and provided with a gear-segment, a secondary frame pivoted in the main frame and provided with a gear-segment, a pinion mounted on the secondary frame and engaging the gear-segment of the main frame, a support-  
60 ing-bar pivoted in the secondary frame, and a pinion mounted in the supporting-bar and engaging the gear-segment of the secondary frame.

11. In a drill, a main frame having an open 65 head at its outer end, a secondary frame having a head pivoted in the head of the main frame on vertical pivots, means for adjusting the secondary frame, a motor-supporting bar pivoted in the head of the secondary  
70 frame on horizontal pivots, and means for adjusting said supporting-bar.

12. In a drill, a main frame having an open head at its outer end, a secondary frame hav-  
75 ing a head pivoted in the head of the main frame on vertical pivots, means for adjusting the secondary frame, a motor-supporting bar pivoted intermediate of its ends on horizontal pivots in the head of the secondary frame, and a pinion and rack for adjusting  
80 said bar.

13. In a drill, a main frame, a secondary frame pivoted in the main frame and pro-  
85 vided with a segmental rack, a supporting-bar pivoted intermediate of its length in the secondary frame to swing at right angles to the movement of said secondary frame and provided with a gear-wheel meshing with the rack, and a motor adjustable on said sup-  
90 porting-bar.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN E. SALES.

Witnesses:

L. J. COLE,  
M. F. INMAN.