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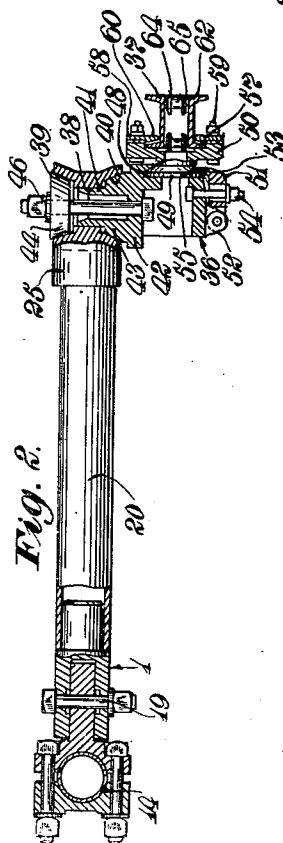
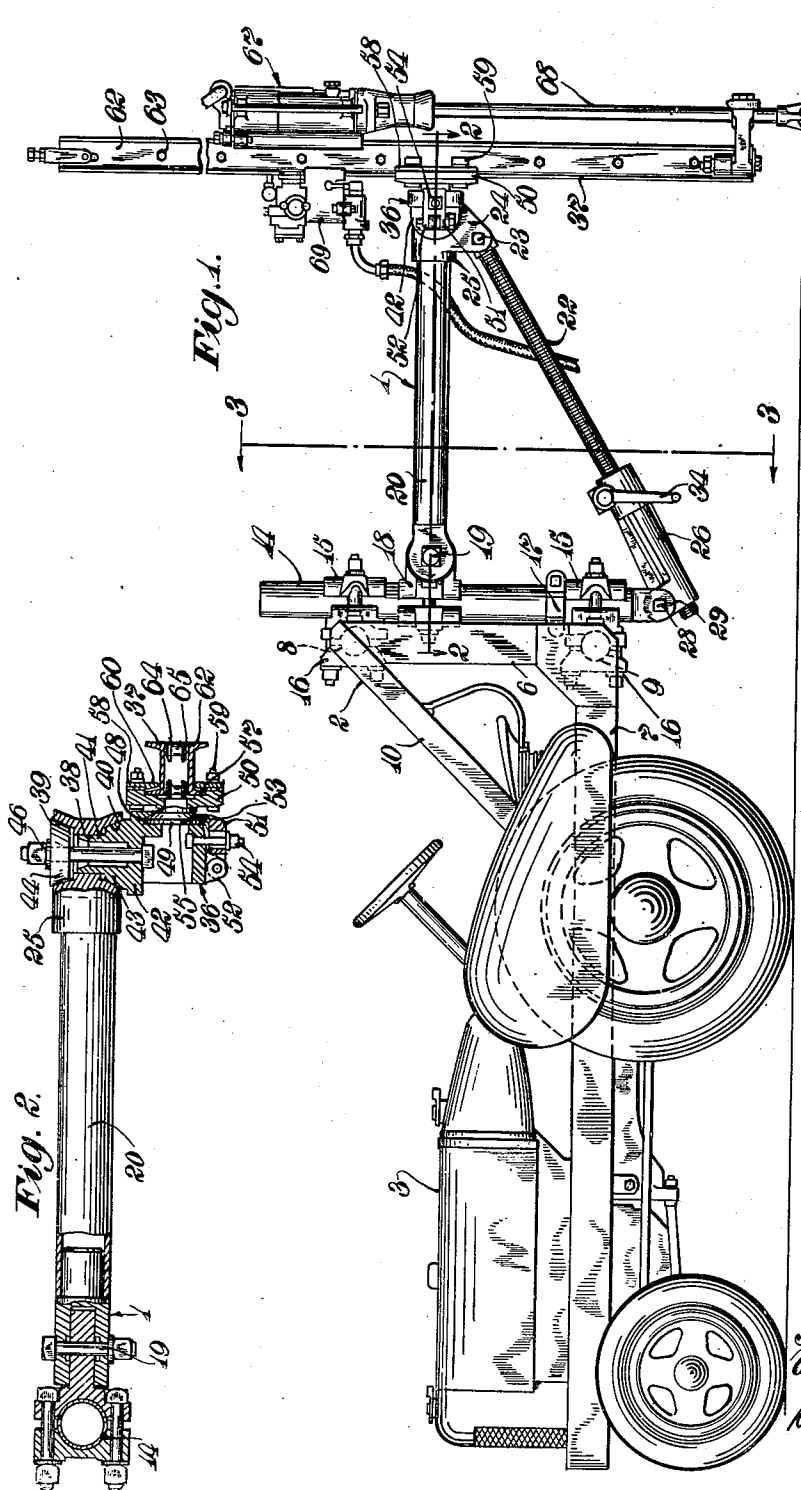
J. C. CURTIS

2,318,595

DRILL MOUNTING

Filed July 5, 1941

2 Sheets-Sheet 1



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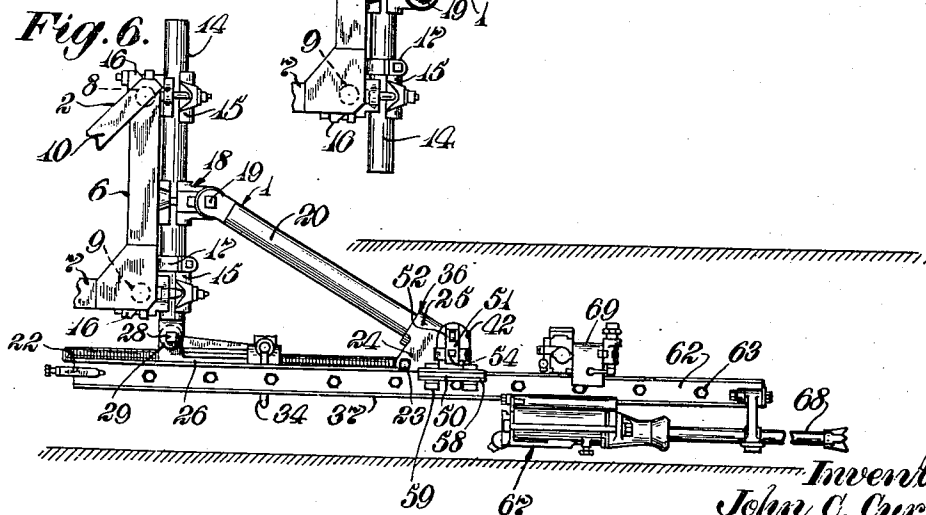
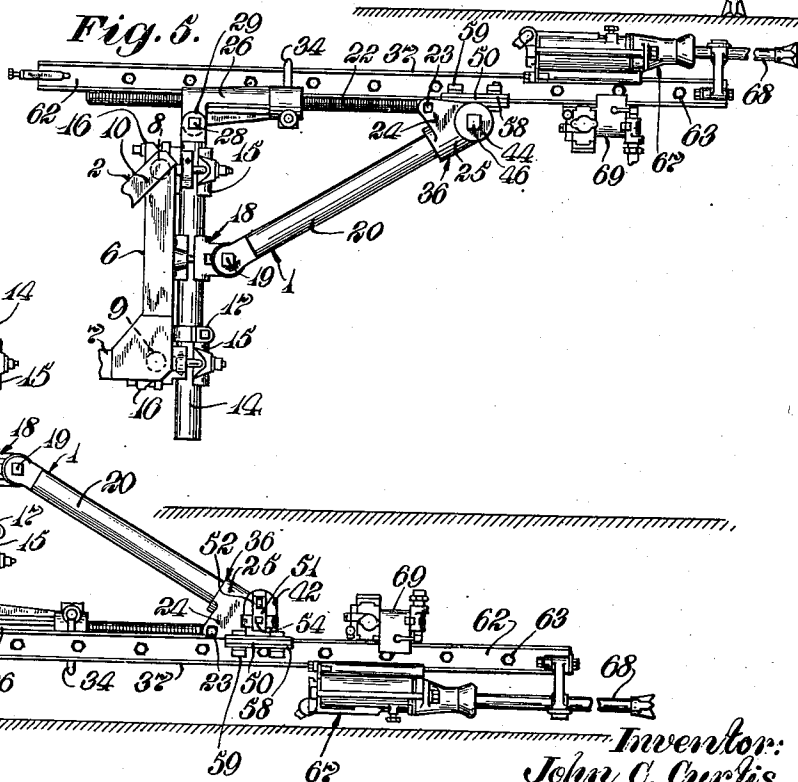
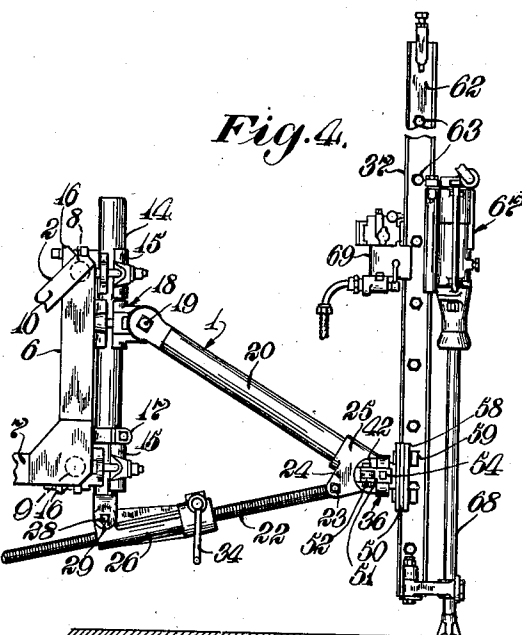
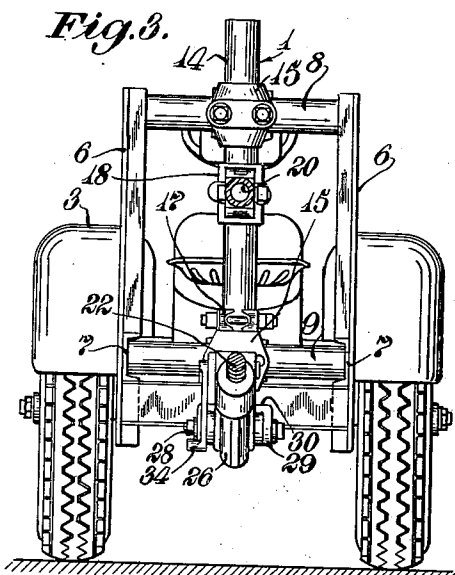
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2,318,595

DRILL MOUNTING

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,318,595

DRILL MOUNTING

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Application July 5, 1941, Serial No. 401,150

12 Claims. (Cl. 255—51)

This invention relates to drill mountings, and more particularly to an improved drill mounting for a hammer rock drill whereby the latter may be supported through a wide range of positions with respect to the work.

It is an object of this invention to provide an improved drill mounting. Another object is to provide an improved adjustable mounting for a rock drill of the hammer type. Still another object is to provide an improved adjustable drill mounting adapted to be connected to a portable frame. Another object is to provide an improved drill mounting adapted to be connected in various positions to a supporting frame and adjustable through a wide range of positions with respect to the work. These and other objects will appear more fully in the course of the following description.

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 side elevational view of a tractor having the improved drill mounting connected thereto.

Fig. 2 is an enlarged detail sectional view of the drill mounting taken on line 2—2 of Fig. 1.

Fig. 3 is a transverse vertical sectional view taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a side elevational view on a reduced scale showing the drill mounting in a vertical drilling position.

Fig. 5 is a side elevational view on a reduced scale showing the drill mounting in an inverted position for drilling horizontal holes at a high level.

Fig. 6 is a side elevational view similar to Fig. 4 showing the drill mounting in a position for drilling horizontal holes near the ground level.

In this illustrative embodiment of the invention, the improved drill mounting, generally designated 1, is shown connected to a frame 2 fixed to the rear end of a tractor 3.

The frame 2 comprises vertical members 6 secured, as by welding, at their lower ends to the extended rear ends of the side frame members 7 of the tractor. Adjacent the upper and lower ends of the members 6 are horizontal members 8 and 9, respectively, having their ends suitably connected, as by welding, to the members 6. Braces 10 are suitably connected to the tractor and to the upper ends of the members 6 for holding the latter in rigid upright positions.

The drill mounting 1 includes a vertical mem-

ber 14 adjustably connected by double clamps 15 and 16 to the horizontal members 8 and 9 of the frame 2. By suitably releasing the clamps, the member 14 may be moved in a vertical direction or in a horizontal direction relative to the members 8 and 9, and the clamps may then be tightened to hold the member 14 rigidly in its adjusted position. A collar 17 is adapted to be clamped in different adjusted positions to the member 14 to hold the latter against dropping down relative to the clamp 15 when the latter is loosened to permit the member 14 to pivot upon its axis. A clamp 18 on the member 14 has pivotally connected thereto at 19 an elongated support, herein in the form of an elongated boom-like member or boom 20 which is swingable upwardly and downwardly in a vertical direction about its pivot. Means is provided for swinging the boom about its pivot connection 19, and this means comprises a non-rotatable screw 22 pivotally connected at 23 to flanges 24 integral with a bracket 25 secured to the outer end of the boom. The inner end of the screw extends through a sleeve-like member 26 which is pivotally connected at 28 to flanges 29 formed on the lower end of the member 14. Arranged within the sleeve-like member 26 are suitable members, not shown, threadedly engaging the screw 22 and rotated by means of worm and gear devices, not shown, and an operating handle 34, for effecting longitudinal movement of the screw through the sleeve-like member. As the screw 22 is moved through the sleeve-like member on manipulation of the operating handle, the boom 20 is swung in a vertical direction about its pivot.

At the outer end of the boom 20 is a swivel mounting, generally designated 36, for supporting a guide member 37 for adjustment about rectangularly related axes. The bracket 25 at the outer end of the boom has a transverse bore 38 opening at its ends within conical sockets 39 and 40 at the opposite sides of the bracket. Arranged in the bore 38 is the cylindrical portion 41 of a swiveled support 42, the latter having a conical portion 43 fitting the socket 40. Positioned in the opposite socket 39 is a conically-shaped clamp member 44, and a bolt 46 extends through openings in the support and clamp members whereby the portion 43 and the clamp member may be drawn toward one another within their sockets, frictionally to clamp the parts tightly in position. The support 42 is provided with a laterally offset socket 48 arranged at right angles to the sockets 39 and 40, for re-

ceiving a portion of a trunnion support 49 formed on a member 50. A clamping element 51 is pivotally connected to flanges 52 formed on the support 42 and is provided with a surface 53 for engaging the portion of the trunnion support opposite the socket 48. A bolt 54 extending through openings in the clamping element and the support 42 is provided for moving the clamping element firmly into engagement with the trunnion support and holding the latter against a seat 55 on the support 42. Formed on the member 50 is a groove 57 for receiving the guide member 37, and at the sides of the groove 57 are clamping elements 58 secured to the member 50 by bolts 59 and having inwardly extending portions 60 for clamping the guide member at various points along its length to the member 50.

The guide member 37 may be similar to that described in my copending application Ser. No. 321,346, filed Feb. 28, 1940, and is shown here as being made up of channel bars 62 clamped in spaced relation with respect to each other by bolts 63. Extending through the spaces 64 between the channel bars is a feed chain 65 supported for circulation around the guide member. Slidably guided by the outer flanges of the channel bars is a drill hammer motor, generally designated 67, for percussively actuating a drill steel 68 in a manner well known to those skilled in the art. The hammer motor is suitably connected to the feed chain 65 to be fed by the latter as it is circulated around the guide member. Clamped to the inner flanges of the channel bars is a fluid actuated motor 69 for driving the feed chain as through self-locking gearing.

The mode of operation of the improved drill mounting is as follows: When it is desired to drill vertical or inclined holes, the mounting may be positioned in the manner shown in Figs. 1 and 4. In order to vary the distance from the rear end of the tractor at which vertical holes may be drilled, the operating handle 34 is turned to effect movement of the feed screw 22 for swinging the boom 20 about its pivot 19. With the boom in the position shown in Fig. 1, the guide member 37 is supported at a maximum distance from the tractor, and as the boom is swung from this position either upwardly or downwardly the horizontal distance between the rear end of the tractor and the outer end of the boom is decreased. With the boom in any of its adjusted positions, the bolts 54 and 46 may be loosened to permit a swinging of the guide member 37 selectively in a transversely extending plane or in a plane extending longitudinally of the boom. The bolts 54 and 46 may then be tightened to hold the guide member rigid with respect to the boom.

If it is desired to drill a horizontal hole near the level of the ground, as shown in Fig. 6, the guide member 37 may be swung 180° from its position shown in Fig. 1 about the pivot axis extending longitudinally of the boom and then swung about its transverse pivot axis while the handle 34 is operated to swing the outer end of the boom to a low position. To drill a horizontal hole at a high level as shown in Fig. 5, the clamps 15 may be removed and the vertical member 14 be turned end for end while the drill mounting is in the adjusted position of Fig. 6. Other adjustments and operations will be readily 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 illus-

tration 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.

5 What I claim as new and desire to secure by Letters Patent is:

1. In combination, in a portable drilling apparatus, an elongated upright pivot member, means for supporting the same for rotation upon an upright axis with the lower end thereof depending in a position spaced from the surface on which said drilling apparatus is supported, a boomlike member connected at one end to said pivot member at a point spaced from either end of the latter and supported by said pivot member for rotation about said upright axis and for pivotal movement on a horizontal axis, a drill guide carried by the other end of said boomlike member, and extensible means pivotally connected to said upright pivot member at the lower end of the latter and to said boomlike member for adjusting the angle of the latter to the vertical and holding the same in different fixed positions.

2. In combination, in a portable drilling apparatus, an elongated upright pivot member, means for supporting the same for rotation upon an upright axis with the lower end thereof depending in a position spaced above the surface on which said drilling apparatus is supported, a boomlike member connected at one end to said pivot member at a point spaced from either end of the latter and supported by said pivot member for rotation about said upright axis and for pivotal movement on a horizontal axis, a drill guide carried by the other end of said boomlike member for adjustment about rectangularly related axes, and extensible means pivotally connected to the lower end of said upright member and to said boomlike member for swinging the latter about said horizontal axis and holding the same in different fixed positions, said extensible means including an element extending across the lower end of said upright pivot member in certain positions of adjustment of said boomlike member.

3. In combination, an elongated pivot member, means for supporting said pivot member in an upright position, a boomlike member, means connecting one end of said boomlike member to said pivot member for rotation about the longitudinal axis of said pivot member and for pivotal movement on a horizontal axis, said last mentioned means being bodily adjustable along said pivot member, a drill guide adjustably carried by the other end of said boomlike member, and extensible means pivotally connected to one end of said upright member on an axis intersected by the axis of said pivot member and to said boomlike member for swinging the latter about said horizontal axis and holding the same in different fixed positions.

4. In combination, an elongated pivot member adjustable means for supporting said pivot member in different upright positions, a boomlike member, means connecting one end of said boomlike member to said pivot member for rotation on rotation of the latter, about the longitudinal axis of said pivot member and pivotal movement on a horizontal axis, said last mentioned means being bodily adjustable along said pivot member, a drill guide carried by the other end of said boomlike member and adjustable relative to said boomlike member about rectangularly related axes, and extensible means connected to said pivot member and to said boomlike member for swinging the latter about said horizontal axis.

5. In combination, an elongated pivot member, adjustable means for supporting said pivot member for rotation about its own axis in different upright positions, a boomlike member, means connecting one end of said boomlike member to said pivot member for rotation, on rotation of the latter, about the longitudinal axis of said pivot member and pivotal movement on a horizontal axis, a drill guide carried by said boomlike member and adjustable relative to the latter, and extensible means connected to said pivot member and to said boomlike member for swinging the latter about said horizontal axis and holding the same in different fixed positions.

6. In combination, a supporting frame, an elongated pivot member, means connecting said pivot member for rotation about its own axis in a vertical position on said supporting frame and providing adjustment to permit lateral and vertical movement of said pivot member relative to said frame, a boomlike member connected at one end to said pivot member for rotation about an upright axis and for pivotal movement on a horizontal axis, a drill guide carried by the other end of said boomlike member, and extensible means pivotally connected to said pivot member and to said boomlike member for swinging the latter about said horizontal axis and holding the same in different fixed positions.

7. In combination, an elongated upright pivot member, supporting means for said pivot member providing for the bodily lateral adjustment thereof relative to said supporting means, for the bodily vertical adjustment thereof relative to said supporting means, and for pivoting thereof on its own axis, a boom having an adjustable pivotal support vertically adjustable along said pivot member, adjusting means for said boom connected to said upright pivot member at one end hereof, and drill supporting and feeding means mounted at the outer end of said boom.

8. In combination, an elongated upright pivot member, supporting means for said pivot member providing for the bodily lateral adjustment thereof relative to said supporting means, for the bodily vertical adjustment thereof relative to said supporting means, and for pivoting thereof on its own axis, a boom having a support vertically adjustable along said pivot member and supporting said boom for pivotal movement on a horizontal axis, adjusting means for said boom connected to said upright pivot member at one end thereof, and drill supporting and feeding means mounted at the outer end of said boom for adjustment relative thereto on rectangularly related axes.

9. In combination, a supporting frame having parallel side members and a plurality of transverse connecting members, an elongated pivot member, means supporting said pivot member in vertical position on said transverse connecting

members and being adjustable to permit bodily movement of said pivot member relative to said connecting members, a boomlike member pivotally connected at one end to said pivot member, a drill guide carried by the other end of said boomlike member, and means pivotally connected to said pivot member and to said boomlike member for swinging the latter about its pivotal connection to said pivot member.

10. In combination, a supporting frame having parallel side members and a transverse connecting member, an elongated pivot member, means supporting said pivot member in a vertical position on said transverse connecting member and being adjustable to permit lateral and vertical movements of said pivot member relative to said connecting member, a boomlike member pivotally connected at one end to said pivot member, a drill guide carried by the other end of said boomlike member, and extensible means pivotally connected to said pivot member and to said boomlike member for swinging the latter about its pivotal connection to said pivot member.

11. In combination, in a portable drilling apparatus, an elongated upright pivot member, means for supporting the same in an elevated position for rotation about an upright axis, a boomlike member connected at one end to said pivot member at a point spaced from either end of the latter and supported by said pivot member for rotation about said upright axis and for pivotal movement on a horizontal axis, a supporting member at the outer end of said boomlike member, extensible means pivotally connected to one end of said upright pivot member and to said supporting member for swinging said boomlike member on said horizontal axis, and a drill guide supported for adjustment upon rectangularly related axes on said supporting member.

12. In combination, an elongated pivot member, means for supporting said pivot member in either of its upright relatively inverted positions and in each case out of contact with subjacent and overlying surfaces, a boomlike member, means connecting one end of said boomlike member to said pivot member for rotation about the longitudinal axis of said pivot member and for pivotal movement on a horizontal axis, said last mentioned means being bodily adjustable along said pivot member, a drill guide carried by the other end of said boomlike member and adjustable relative to said boomlike member about rectangularly related axes, and extensible means connected to said pivot member and to said boomlike member for swinging the latter about said horizontal axis, said extensible means disposable in high or low positions, depending upon the position in which said elongated pivot member is supported.

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