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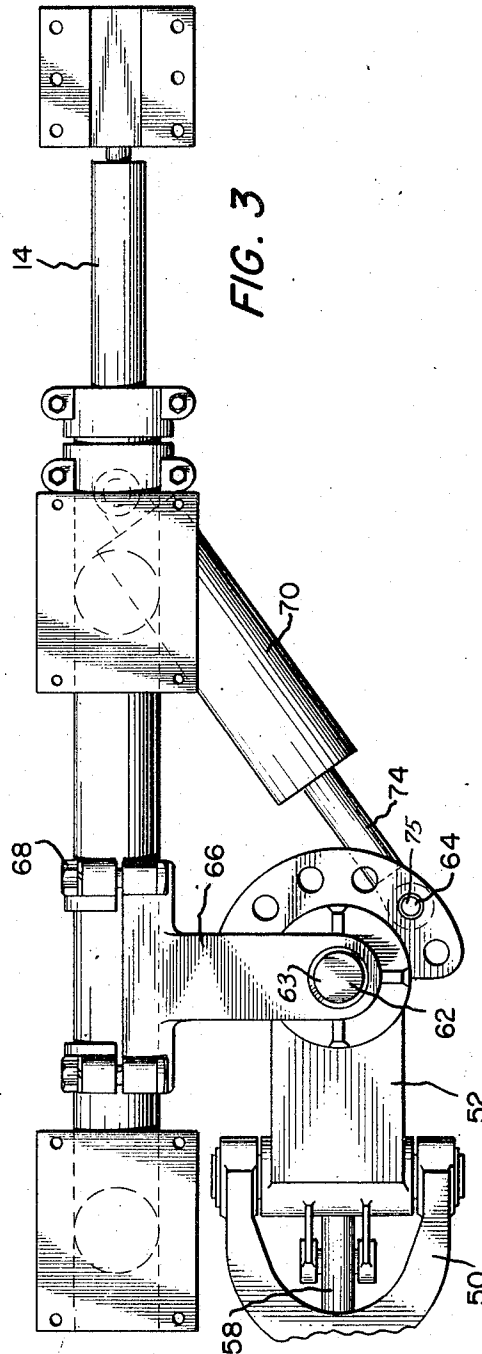
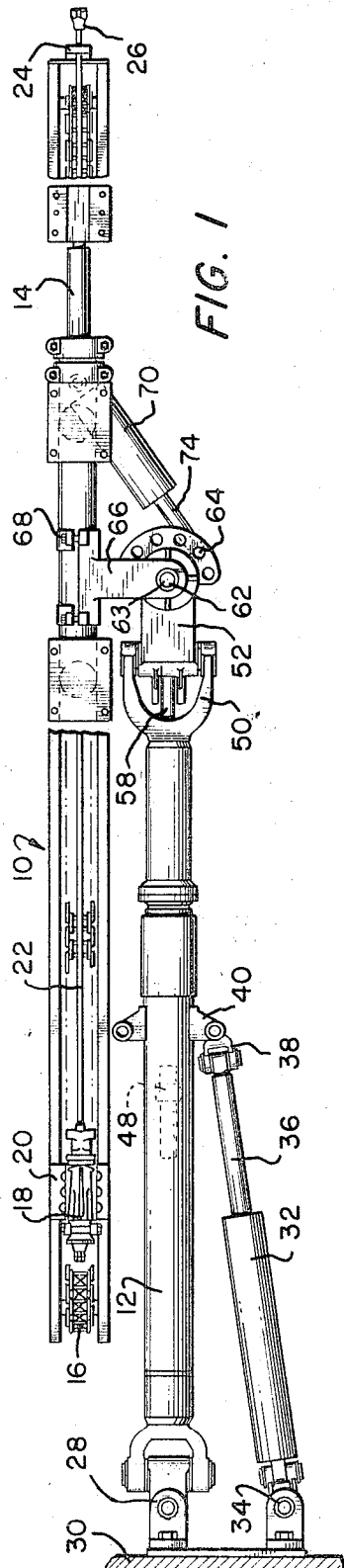
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3,304,033

BOOM MOUNTED DRILL SUPPORT

Filed March 12, 1965

3 Sheets-Sheet 1



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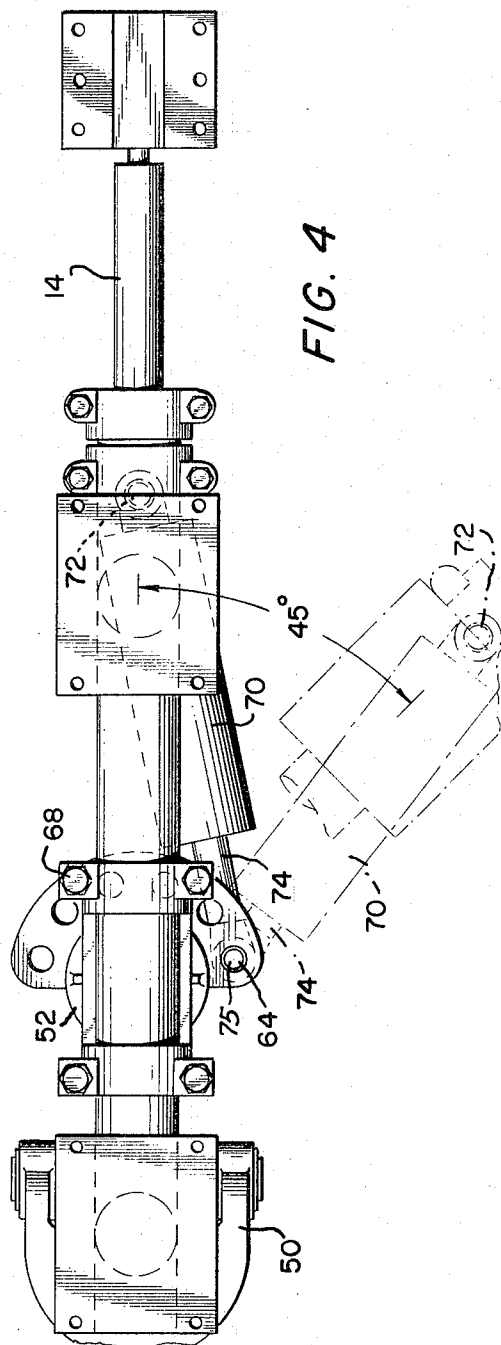
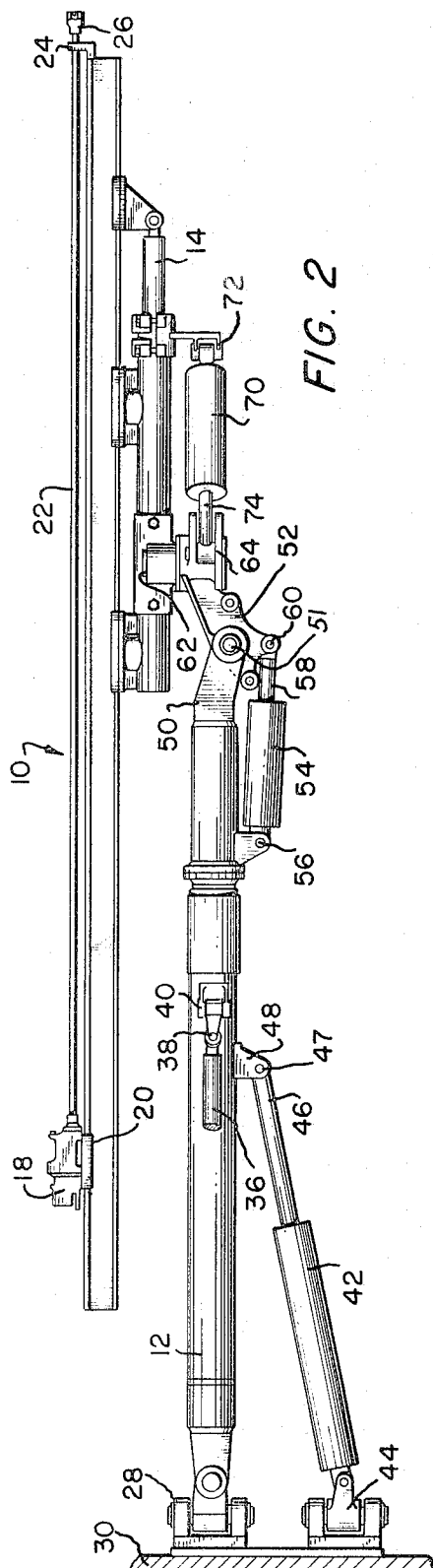
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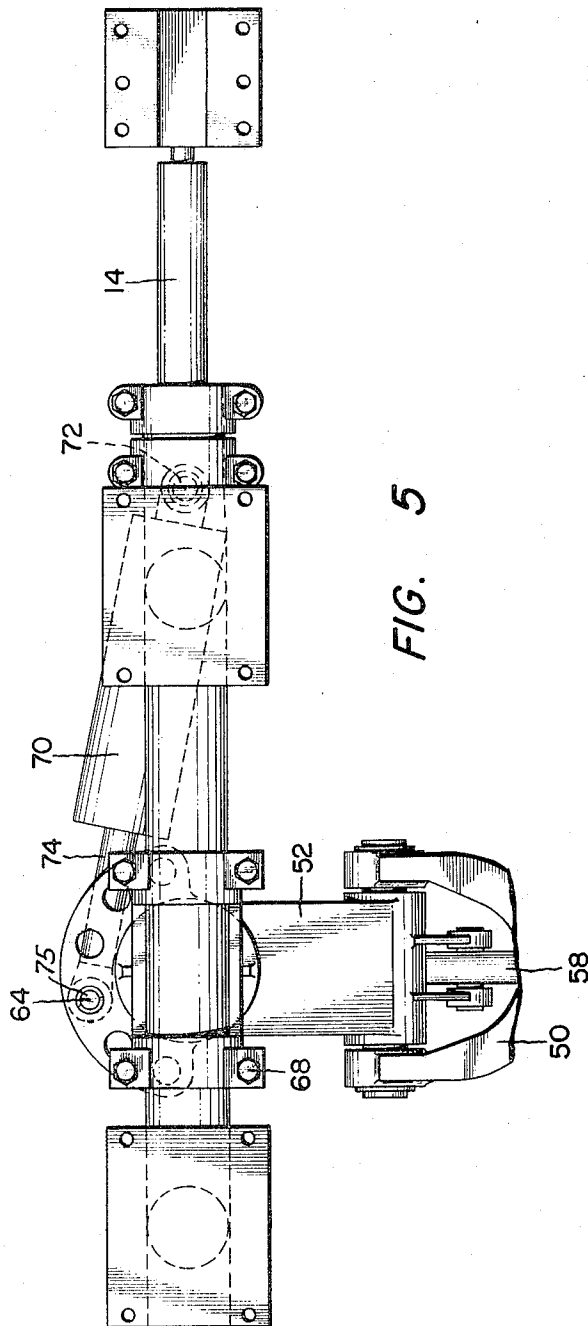


FIG. 5

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BOOM MOUNTED DRILL SUPPORT

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8 Claims. (Cl. 248-16)

This invention relates to boom supported rock drill apparatus and has particular reference to the provision of a new and improved boom mounted support which is particularly adapted to operatively carry substantially all forms of boom supported rock drill apparatus and to facilitate angle and cross-hole drilling thereby.

An object of the present invention is to provide a new and improved boom mounted support which is particularly adapted to carry substantially all forms of boom supported rock drill apparatus.

Another object of the invention is to provide a new and improved boom mounted support of the type set forth which is adapted to carry both offset- and center-mounted rock drill apparatus and, thus, eliminates any requirement for individual right-hand, left-hand, and center-mounting type booms.

Another object is to provide a new and improved boom-mounted support of the type set forth which facilitates angle and cross-hole drilling by the carried rock drill apparatus.

Another object is to provide a new and improved boom-mounted support of the type set forth which is relatively simple and economical in construction and operation.

Another object is to provide a new and improved boom-mounted support of the type set forth which is particularly adapted for drilling equipment such as a tunnel jumbo, but which may be employed wherever rock drill apparatus is boom supported.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings. It will be understood that changes may be made in the details of construction and arrangement of parts shown and described as the preferred forms of the invention have been given by way of illustration only.

Referring to the drawings:

FIG. 1 is a top-plan view, partially broken away, of an offset-mounted, boom-supported rock drill embodying the present invention;

FIG. 2 is an elevational view of the boom-supported rock drill shown in FIG. 1;

FIG. 3 is an enlarged, fragmentary, top-plan view of the rock drill supporting means and offset rock drill mounting shown in FIGS. 1 and 2;

FIG. 4 is a view generally similar to that of FIG. 3, but illustrating the supporting means in combination with a center rock drill mounting, one of the angular limits of movement of the drill mounting being shown in dotted lines; and

FIG. 5 is a view showing the center rock drill mounting in position for cross-hole drilling.

Referring more particularly to the drawings wherein similar reference characters designate corresponding parts throughout the several views, FIGS. 1 and 2 illustrate a rock drill apparatus designated generally at 10 which is horizontally offset from and supported by the boom 12.

The rock drill apparatus 10, more specifically, is mounted upon the longitudinally extending guide or rock drill support 14 which is offset from the boom 12 on the left-hand side of the longitudinal axis thereof. As employed herein, the terms "left-hand" and "right-hand" shall be understood to designate relative directions as taken from

a point of reference axially behind the boom and facing the rearward end thereof.

The rock drill apparatus 10 comprises the endless chain belt 16 which passes longitudinally around the rock drill support 14 and is adapted for movement thereabout. The drill actuating motor 18 is mounted upon the supporting plate 20 which is carried by the chain belt 16 for movement therewith. The drill steel 22 is connected adjacent its longitudinally rearward end to the actuating motor 18, held in alignment with the rock drill support 14 by the centralizer 24, and carries the drill bit 26 forwardly of the centralizer 24.

The boom 12, more specifically, is adapted for both horizontal and vertical pivotal movement and has an end connected by the universal pivot 28 to the fixed support 30 which may be secured to a drilling platform. The horizontal pivotal movement of the boom 12 is controlled by a hydraulically operated motor means comprising a cylinder 32 which is pivotally connected at 34 to the support 30 and a piston rod 36 which is pivotally connected at 38 to the flange 40 on the boom 12. The vertical pivotal movement of the boom 12 is controlled by a hydraulically operated motor means which comprise a cylinder 42 pivotally connected at 44 to the support 30 and a piston rod 46 pivotally connected at 47 to the flange 48 carried by the boom 12. The boom 12 may also be extensible and include an internal extension, hydraulically operated motor means (not shown) and be provided with a roll-over apparatus to increase the operating flexibility of the rock drill apparatus 10.

The end of the boom 12 opposite to that pivotally connected to the support 30 fixedly carries the yoke member 50 which, in turn, pivotally carries the connecting member or means 52. The connecting member 52, as illustrated in FIG. 2, is pivotally connected by a pivot pin 51 to the yoke member 50 for vertical movement relative to the boom 12. The pivotal movement of the connecting member 52 relative to the boom 12 is controlled by a hydraulically operated motor means comprising a cylinder 54 which is pivotally connected to the lug 56 on the boom 12 and a piston rod 58 which is pivotally connected at 60 to the connecting member 52.

The connecting member 52 is particularly adapted to carry substantially all forms of offset- or center-mounted rock drill apparatus 10 relative to the boom 12 and also facilitates angle and cross-hole drilling by the carried rock drill apparatus 10. More specifically, the connecting member 52 is provided with a single, centrally disposed, primarily pivotal attachment point 62 and a plurality of arcuately disposed, secondary pivotal attachment points 64 radially forward of the attachment point 62. The attachment points 64, as illustrated, are arranged to include a pair of attachment points 64 forward and substantially axially of the boom 12, a pair of attachment points 64 on the left-hand side of the longitudinal axis of the boom 12, and a pair of attachment points 64 on the right-hand side of the longitudinal axis of the boom 12.

As illustrated in FIGS. 1 through 3, the mounting arm 66 is pivotally connected adjacent one of its ends at the attachment point 62 on the connecting member 52 by a pivot pin designated as 63 and extends longitudinally from the attachment point 62. The opposite end of the mounting arm 66 is fixedly secured to the drill support 14 by the bolts or similar fastening means 68 and carries the rock drill support 14 offset on the left-hand side of the longitudinal axis of boom 12.

The pivotal movement of the rock drill support 14 relative to the boom 12 is controlled by a hydraulically operated motor means comprising a cylinder 70 which is pivotally connected at 72 to the rock drill support 14 and a piston rod 74 which is pivotally connected to one

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of the attachment points 64 on the connecting member 52. As the illustrated drill support 14 is offset on the left-hand side of the axis of the boom 12, the illustrated piston rod 74 is connected by a pivot pin designated as 75 to one of the pair of attachment points 64 on the right-hand side of the boom axis. Thus, the rock drill apparatus 10 which is carried by the left-hand offset drill support 14 is provided with an effective operating range extending axially forward of the boom 12 and in angular relation thereto.

Similarly, it will be seen that, with a rock drill support 14 mounted by a mounting arm 66 on the right-hand side of the longitudinal axis of the boom 12, the piston rod 74 will be connected to one of the pair of attachment points 64 on the left-hand side of the boom axis. Again, the operating range of the rock drill apparatus 10 carried by the rock drill support 14 will be axially forward of the boom 12 and angularly thereto.

FIGS. 4 and 5 illustrate the connecting member 52 in combination with a rock drill support 14 which is axially or center mounted thereupon. As will be seen from FIG. 4, when the use of the rock drill apparatus 10 is required forward of the boom 12, the piston rod 74 is connected to the most rearwardly of the attachment points 64 on either side of the boom 12. With this connection the rock drill apparatus 10 carried by the center-mounted rock drill support may be utilized forwardly of the boom 12 and has a horizontal range of 45° on either side of the longitudinal axis of the boom 12.

As illustrated in FIG. 5, when it is desired that a cross hole be drilled at 90° to the longitudinal axis of the boom 12, the piston rod 74 is connected to one of the pair of attachment points 64 which is axially forward of the boom 12.

The operation of the invention is believed to be apparent from the foregoing description.

It will be seen from the foregoing that the boom-mounted support which is provided by the present invention carries both offset- and center-mounted rock drill apparatus without modification or alteration and eliminates any requirement for individual right-hand, left-hand, and center-mounting type booms. As will also be seen from the foregoing description, the present invention is relatively simple and economical both in construction and operation and, although particularly useful for drilling equipment such as tunnel jumbos, may be employed wherever rock drill apparatus is boom mounted.

It will be seen from the foregoing that I have provided new and improved means for accomplishing all of the objects and advantages of the invention.

Having thus described my invention, I claim:

1. An apparatus for mounting a rock drill comprising:

a boom;
a supporting member adapted for carrying a rock drill;

connecting means carried by said boom;

means for pivotally connecting said supporting member to said connecting means;

said connecting means including a plurality of attachment points separate from said means for pivotally connecting said supporting member to said connecting means;

motor means connected to said supporting member for pivoting said supporting member relative to said boom; and

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means for connecting said motor means to said connecting member alternatively at each of two of the plurality of attachments points on said connecting means.

2. An apparatus according to claim 1, wherein said connecting means comprises a connecting member carried by said boom adjacent one end of said boom.

3. An apparatus according to claim 2, further comprising:

means for pivotally connecting said connecting member for vertical movement relative to said boom; and

second motor means for pivoting said connecting member relative to said boom.

4. An apparatus for mounting a rock drill comprising:

a boom;

a supporting member adapted for carrying a rock drill;

a connecting member carried by said boom adjacent one end of said boom;

said connecting member including a primary attachment point and a plurality of secondary attachment points spaced from said primary attachment point; means for pivotally connecting said supporting member to said connecting member at said primary attachment point on said connecting member;

motor means connected to said supporting member for pivoting said supporting member relative to said boom; and

means for pivotally connecting said motor means to said connecting member alternatively at each of said secondary attachment points on said connecting member.

5. An apparatus according to claim 4, wherein said secondary attachment points on said connecting member are arranged arcuately around said primary attachment point.

6. An apparatus according to claim 5, further comprising:

means for pivotally connecting said connecting member for vertical movement relative to said boom; and

second motor means for pivoting said connecting member relative to said boom.

7. An apparatus according to claim 6, wherein said secondary attachment points on said connecting member are arranged arcuately around said primary attachment point.

8. An apparatus according to claim 7, wherein said secondary attachment points are arranged such that one of said secondary attachment points is located substantially on the axis of said boom, and one of said secondary attachment points is located on each side of the axis of said boom.

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