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J. H. WAGNER

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ROCK DRILL SUPPORTING CARRIAGE

Filed Aug. 21, 1957

3 Sheets-Sheet 1

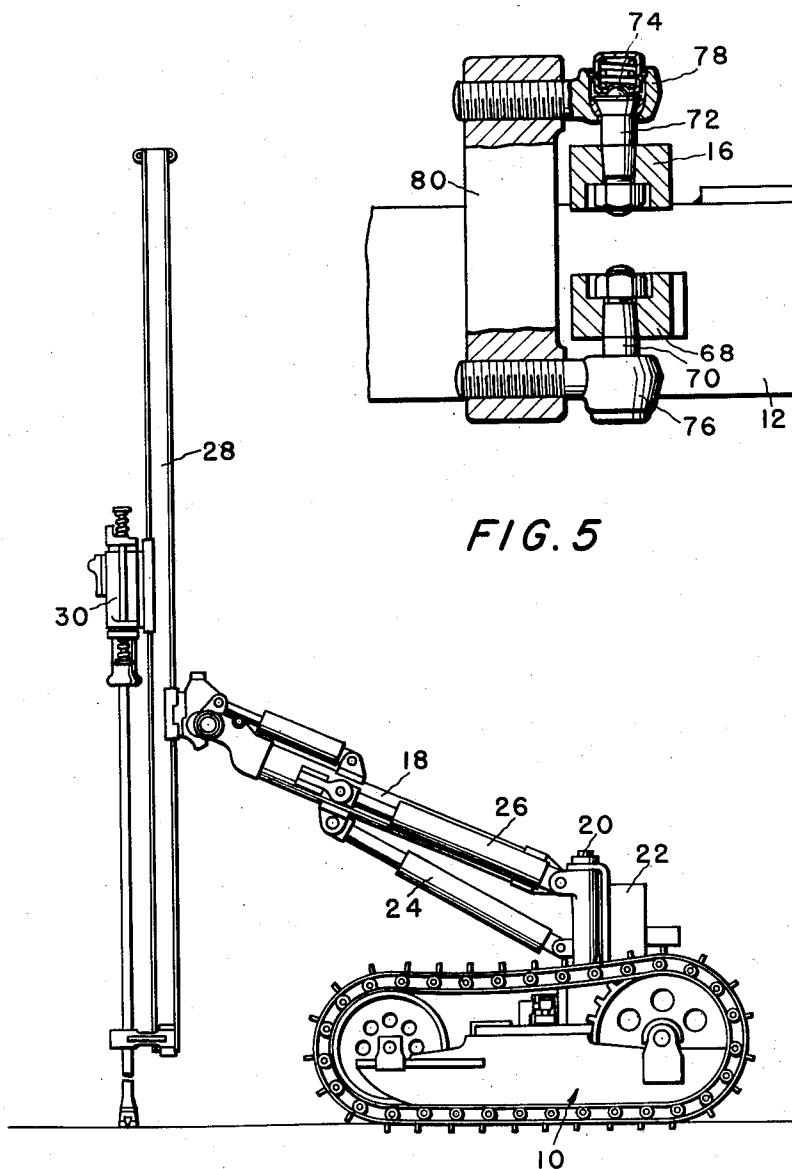


FIG. 5

FIG. 1

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3 Sheets-Sheet 2

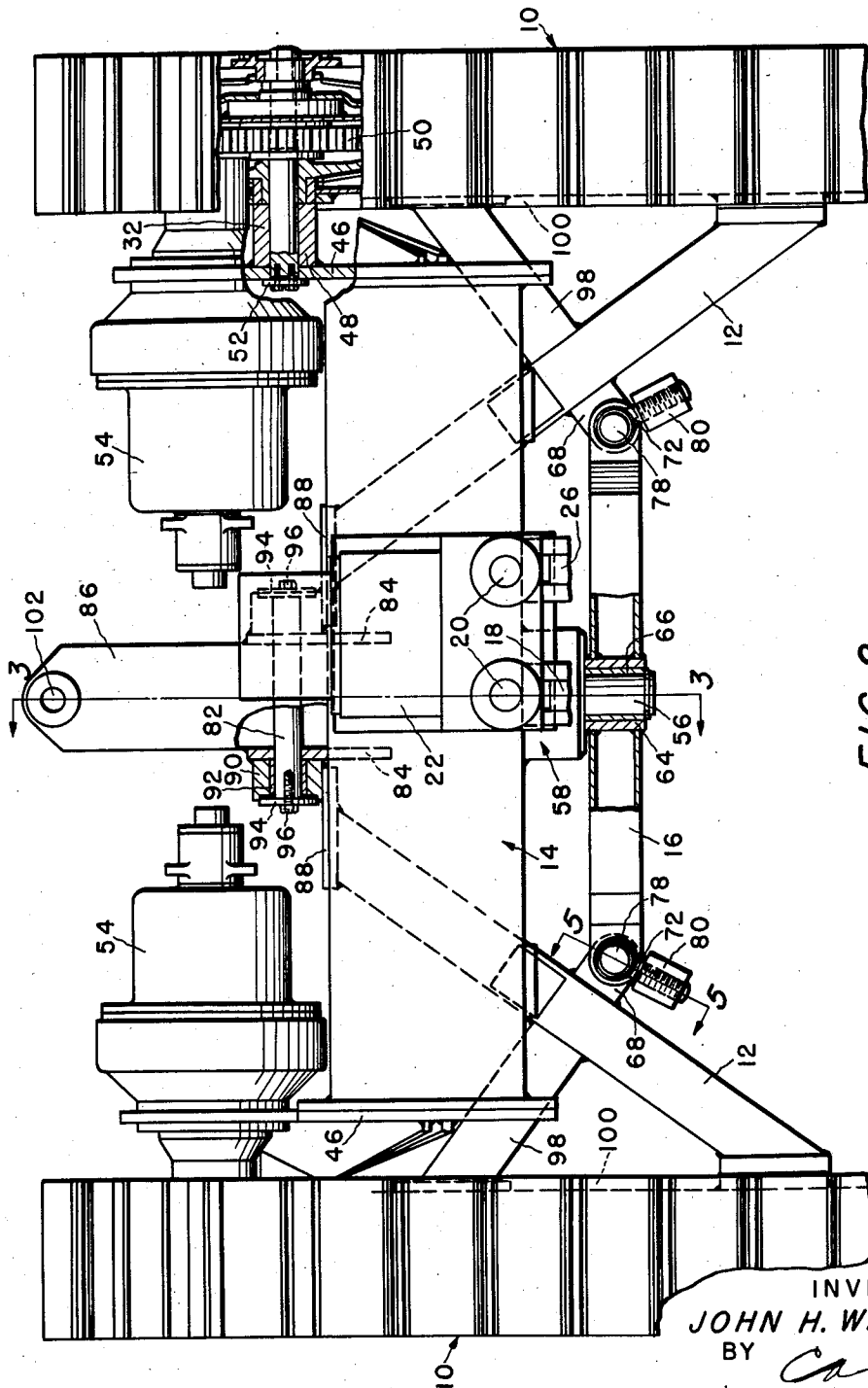


FIG. 2

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3 Sheets-Sheet 3

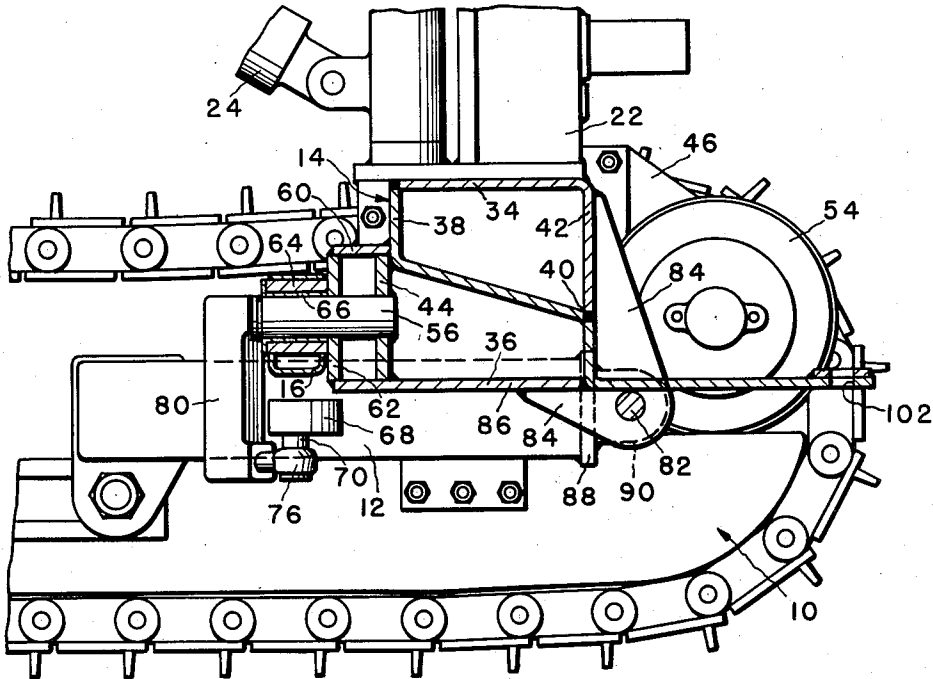


FIG. 3

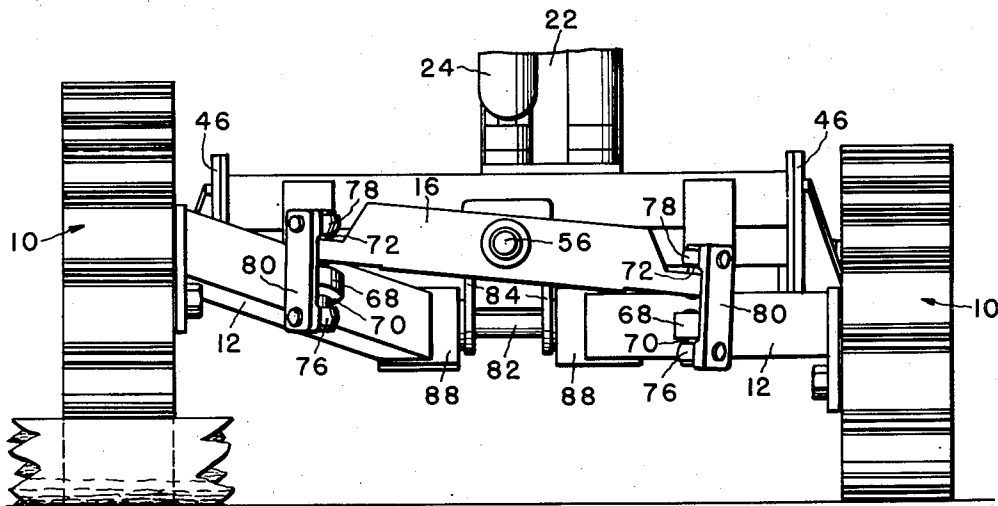


FIG. 4

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ROCK DRILL SUPPORTING CARRIAGE

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6 Claims. (Cl. 280—111)

This invention relates to improvements in rock drill supporting carriages.

An object of the present invention is to provide an improved rock drill supporting carriage that will permit travel over uneven ground.

Another object of the invention is to provide a rock drill supporting carriage that will permit travel over very soft ground by distributing its weight over the entire lower surface of the endless tracks.

A further object is to provide a rock drill supporting carriage that will better resist forces tending to separate the endless tracks, and will reduce the bending movement of the structure when turning the carriage.

Other objects will be in part obvious and in part pointed out in the following specification and drawings in which,

Figure 1 is a side elevation of a preferred form of rock drill supporting carriage constructed in accordance with the practice of the invention,

Fig. 2 is a plan, partly in section, of the drill supporting carriage with the drill and supporting arms removed,

Fig. 3 is a sectional elevation of the rear part of the rock drill supporting carriage taken along the line 3—3 of Fig. 2 looking in the direction indicated by the arrows,

Fig. 4 is a front elevation of the rock drill supporting carriage showing the position of the cross bar when one of the track laying members is going over a log or rock, and

Fig. 5 is an elevation, partly in section, of the link with two ball joints taken along the line 5—5 of Fig. 2 looking in the direction indicated by the arrows.

The rock drill supporting carriage illustrated in the drawings comprises a pair of endless track laying frames 10 laterally spaced apart, each of which are provided with a beam 12 attached forwardly of its corresponding frame 10 and extending rearwardly and inwardly therefrom a deck 14 pivotally bounded rearwardly on the frames 10 and also pivotally connected at the rear of each of the beams 12, the deck 14 being provided at its forward side to a cross bar 16 which is in turn connected to the beams 12.

The deck 14 is adapted to support a suitable rock drill carrying boom of any suitable character, in this instance as indicated in Fig. 1, having an outwardly extending arm 18 mounted on a vertical pivot 20 for lateral movement, the pivot 20 being supported by a suitable bracket 22 rigidly fastened to the deck 14. In this instance, the arm 18 is adapted to swing vertically on a pivot (not shown) such motion being accomplished by a lifting cylinder 24 preferably of the hydraulic type. Lateral movement is effected by means of a second hydraulic cylinder 26 lying in the same general plane as the arm 18. As indicated in Fig. 1, a mast 28 is provided pivotally mounted at the outer end of arm 18 upon which is suitably guided a well known type of

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pneumatic rock drill 30. The boom and rock drill are merely referred to as a well known type of drilling equipment and for illustration purposes only being no part of the invention.

It is understood that when drilling operations are carried on the drilling rig is moved from place to place and the ground is apt to be uneven. It is desirable that the drilling rig should not be subject to too much tipping as it is inclined in most cases to be top heavy. To this end the track laying frames 10, as illustrated of the endless track type variety, are adapted to swing vertically about the rear gear axles shown at 32 and each frame is independent of the other in its motion so that the front end of one can tip up with respect to the other such as indicated in Fig. 4.

It is desirable that this tipping of the frames 10 should have as little effect as possible upon the deck 14 which is the purpose of the arrangement of the deck supporting arrangement herein described. To this end the deck in this instance is a hollow box-like structure (Fig. 3) for the sake of rigidity being composed of a pair of horizontal plates, the upper being shown at 34 and the lower at 36 connected by a plate 38 having an upper leg welded to the plate 34 bent to form a rearwardly extending leg welded as at 40 to the downwardly bent section 42 of plate 34. A downwardly extending plate 44 forms the front wall of the deck box 14, connecting the plate 38 to the lower plate 36. At each end of the deck 14 there is provided a plate 46 to which is welded a cylindrical bearing member 48 to receive the axles 32 of the drive gears 50 of the frames 10, the axles being held in place by retainers 52. Plates or flanges 46 also provide a support for the driving air motors 54 actuating drive gears 50 of the frames 10. While the deck 14 is thus capable of pivotal motion with regard to the axles 32 it is restrained in this respect by its associated connections to the beams 12. For this purpose the cross bar 16 which is pivotally attached to the beams 12 has a central pivotal connection at a pin 56 extending forwardly from the deck 14 there being provided a boss 58 to which the pin is permanently attached. The boss 58 consists of an upper plate 60 welded to plates 38 and 44 and to a downwardly extending plate 62 joining plate 60 and the lower plate 36. Cross bar 16 is provided with a central bearing portion 64 provided with a bushing 66. At each end of the cross bar 16 the pivotal connection to beam 12 is carried by a bracket 68 extending at right angles to the beam 12. The connection which is shown in detail in Fig. 5 consists of a downwardly extending bolt-like member 70 rigidly attached to the bracket 68 and which is entirely similar to a member 72 also likewise rigidly attached to the end of the cross bar 16. The members 70 and 72 have spherical bearing ends 74 contained within socket members 76 and 78, respectively, each of which is screwed into an upright connecting link 80 which as will be understood will transfer any downward pressure on the end of the cross bars 16 to the bracket 68. The linkage thus described permits rotational movement of the cross bar 16 within a tendency to pull the tracks 10 together. Any force tending to misalign the tracks 10 is counteracted by a pivotal connection at the rear end of the beams 12 on the deck 14 as shown in Figs. 2 and 3. This pivotal connection consists of a pin 82 rigidly mounted behind the deck 14 on a pair of spaced brackets 84 in the form of plates welded to the rear wall 42 (Fig. 3) and the bottom wall 36, further reinforced by a horizontal tongue 86 also welded to the rear wall 42 and to the plates 84. Extending rearwardly at the rear of each beam 12 is welded a plate 88 upon which is also welded a bearing block 90 containing a bearing bush-

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ing 92 for the ends of pin 82. Pin 82 is kept in place laterally by retainer plates 94, attached to the ends of the pin by bolts 96.

In order to prevent the beams 12 from being twisted by the pressure applied on the bracket 68 there are provided braces 98 welded at one end to the beams 12 at points opposite the bracket 68 and extending over and welded to the inner face plates 100 of the frames 10.

Details of the frames 10 are not described since they are each conventional track laying frames procurable from many sources. They are often known as crawlers.

As the carriage moves about over rough ground it is understood that the frames or crawlers 10 will encounter obstacles particularly at the front end, and it is desirable that these should be able to rise with minimum effect upon the drill 30. It will be seen that as one of the frames 10 rises at the front end, as for instance shown in Fig. 4, there will be a proportionate rise in the adjacent end of the cross bar 16. The amount of such rise in the cross bar 16, however, will be small in proportion to the rise in the frame 10 since the cross bar 16 is located rearwardly of the end of the frame 10 and the end of the cross bar 16 affected is also well in toward the center. Furthermore, the amount by which the pin 56 which is rigid with respect to the deck 14, will move is only half of the amount which the end of the cross bar 16 moves. Therefore, the effect on the mast 28 of the drill is relatively slight. Furthermore, and what is most important, the frames 10 while being free to move about their centers of rotation, the axles 32 and the pin 82 which is in alignment therewith, any lateral thrust is completely counteracted by the angularity of the beams 12 and the free motion of the linkage connections as shown in Fig. 5.

As is indicated, the drill carriage is self propelled and it may be desirable at times that it should be able to pull other apparatus. For this purpose the tongue 86 can be utilized as a draw bar there being provided an aperture 102 to receive a hook or other connection (not shown) on the apparatus to be towed.

Thus by the above construction are accomplished among others the objects hereinbefore referred to.

I claim:

1. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions of said frames and pivotally connected to the rearward ends of said beams, a cross bar pivotally connected at its midpoint to the forward end of said deck, and links pivotally connected to the ends of said cross bar and pivotally connected to said beams.

2. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions

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of said frames and pivotally connected to the rearward ends of said beams, the pivotal connections of the deck to the frames and to the beams being in alignment, a cross bar pivotally connected at its midpoint to the forward end of said deck, and links pivotally connected to the ends of said cross bar and pivotally connected to said beams.

3. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam rigidly attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions of said frames and pivotally connected to the rearward ends of said beams, a cross bar pivotally connected at its midpoint to the forward end of said deck, and links pivotally connected to the ends of said cross bar and pivotally connected to said beams.

4. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions of said frames and pivotally connected to the rearward ends of said beams, a cross bar pivotally connected at its midpoint to the forward end of said deck, and links pivotally connected to the ends of said cross bar and pivotally connected to said beams intermediate their ends.

5. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions of said frames and pivotally connected to the rearward ends of said beams, a cross bar pivotally connected at its midpoint to the forward end of said deck, and substantially vertical links pivotally connected to the ends of said cross bar and pivotally connected to said beams.

6. A rock drill supporting carriage comprising a pair of endless track laying frames laterally spaced apart, a beam attached forwardly on the inward side of each of said frames and extending rearwardly and inwardly therefrom, a deck pivotally connected to the rearward portions of said frames and pivotally connected to the rearward ends of said beams, a cross bar pivotally connected at its midpoint to the forward end of said deck, a pair of links, and ball and socket joints connecting the links to the ends of the cross bar and to said beams.

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