

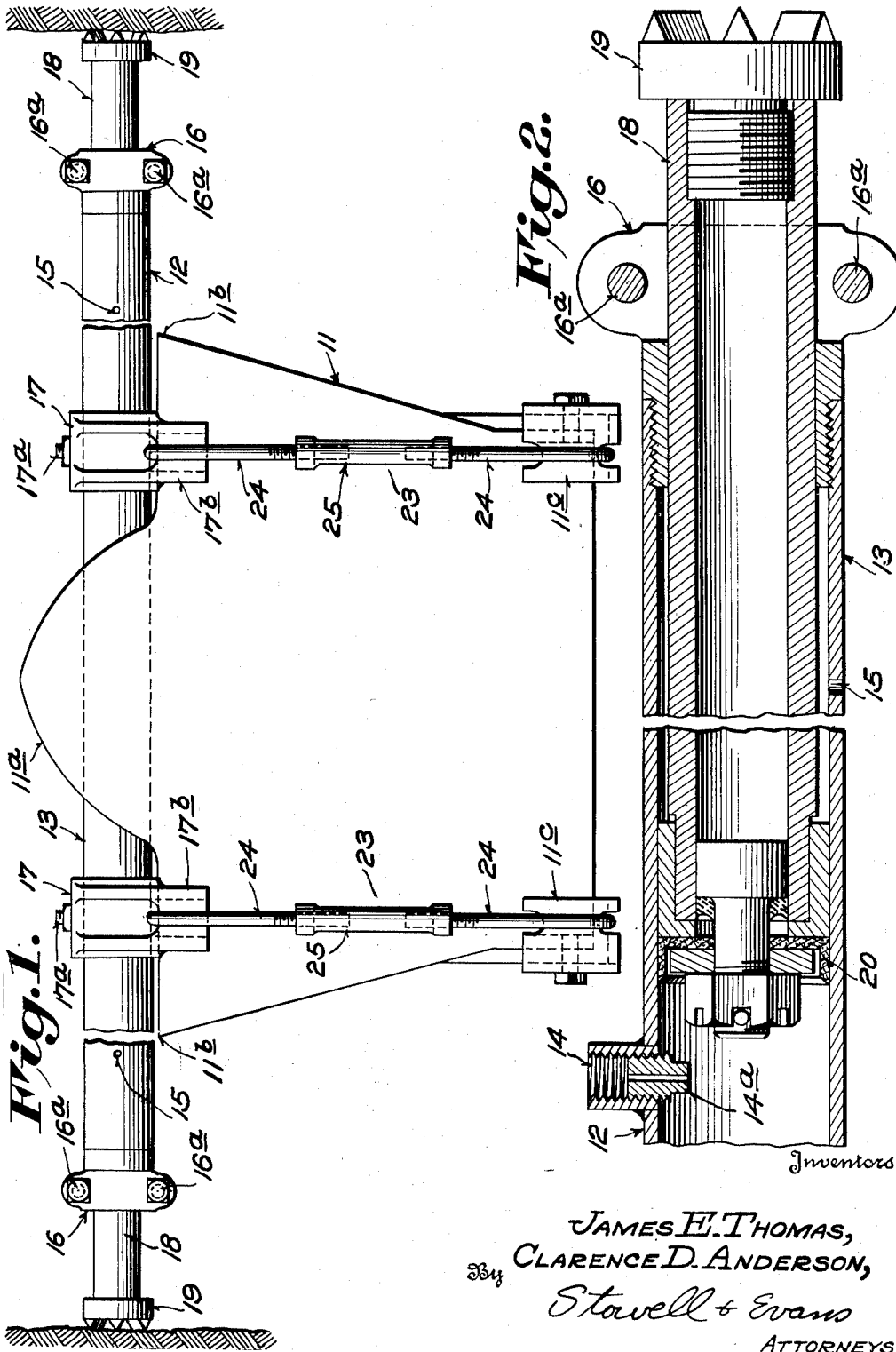
Dec. 30, 1952

J. E. THOMAS ET AL
DRILL SUPPORTING DEVICE

2,623,739

Filed Dec. 3, 1948

3 Sheets-Sheet 1



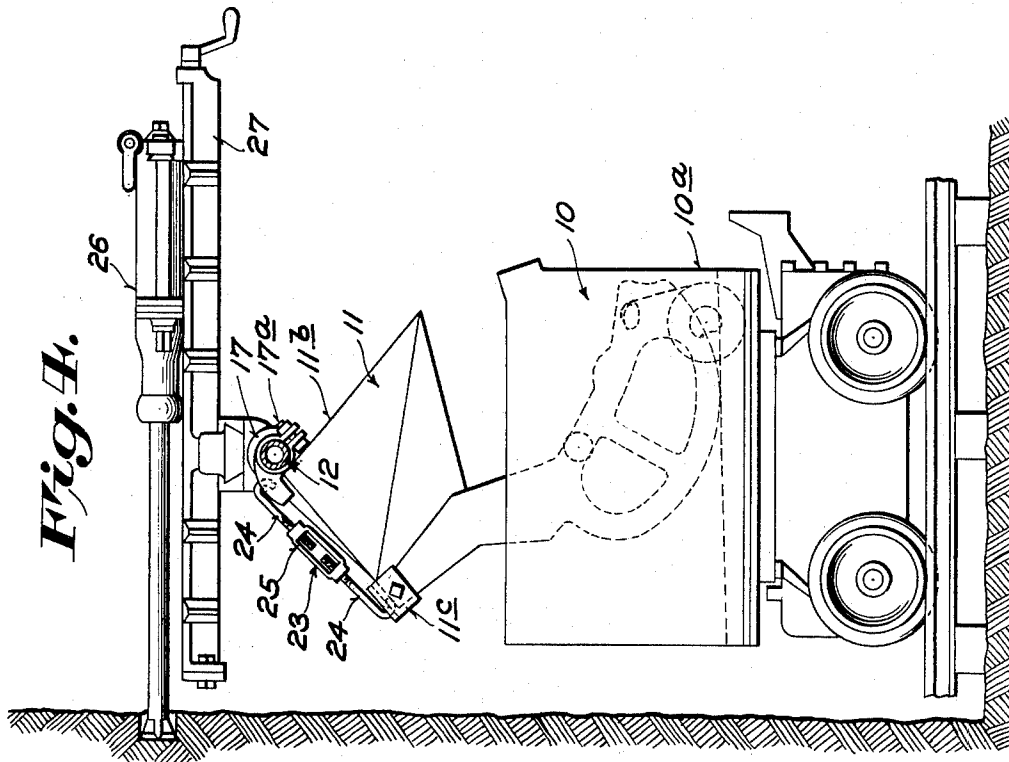
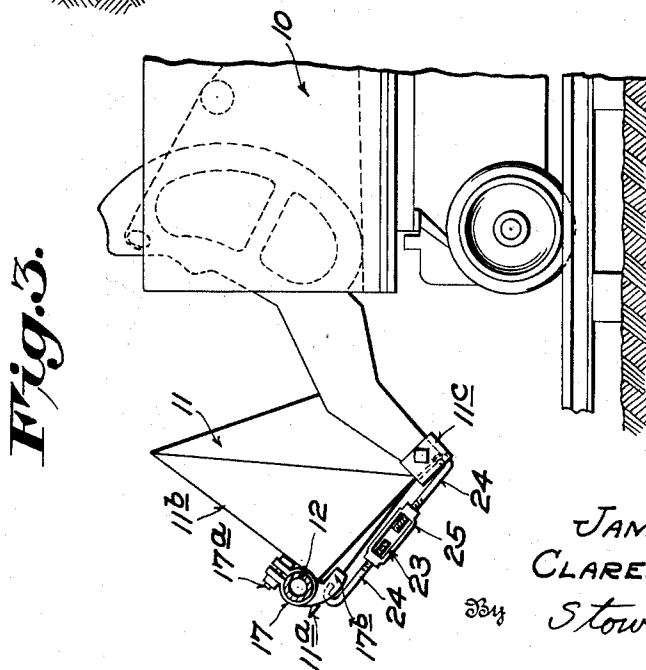
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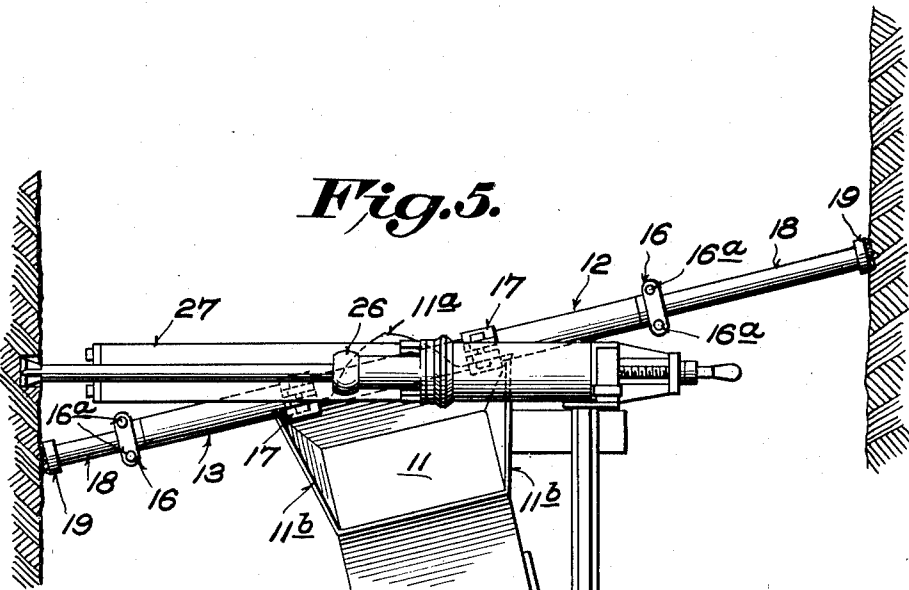
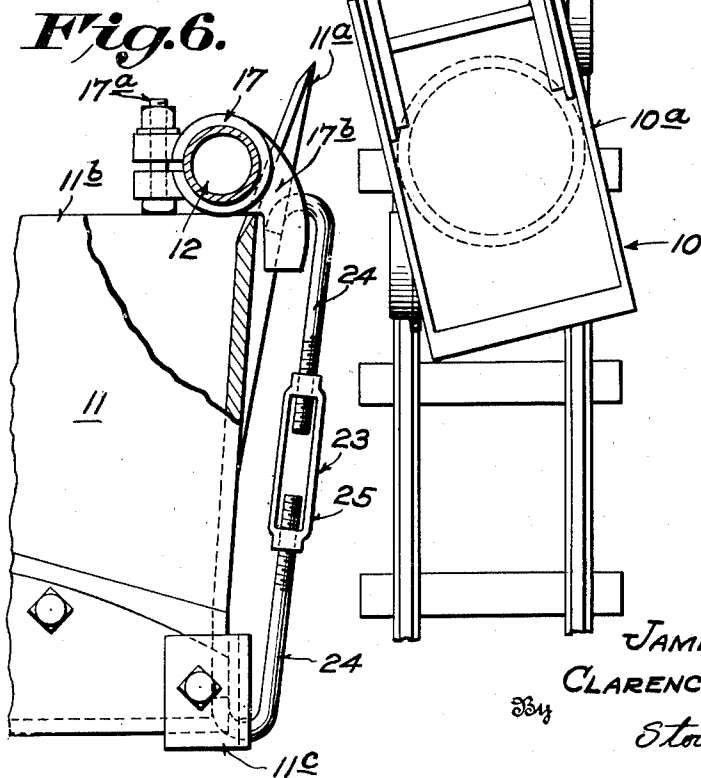
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UNITED STATES PATENT OFFICE

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DRILL SUPPORTING DEVICE

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2 Claims. (Cl. 262-8)

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This invention relates to rock drilling machines and, more particularly, to a rock drill supporting device adapted to be carried by the bucket of an overhead shovel loader or the like.

A principal object of the invention is to provide a drill supporting device which may be speedily and simply attached to the bucket of a mucking shovel without modification of the structure of the shovel.

Another object of the invention is to provide a drill supporting device for mining and tunneling that will effect a great saving in time and expense by making possible the use of the muck removing vehicle as the motive power for a drill and drill support.

A further object of this invention is to provide a drill supporting device which may be conveniently and rapidly adjusted throughout a wide area of operation from a single position of the supporting vehicle.

Another object of the invention is to provide such a device that can be readily adjusted for horizontal, vertical or angular drilling at various levels.

A further object is to provide a drill supporting device with extendible wall engaging ends that will rigidly support the drill within a wide range of positions and attitudes.

These and other objects and advantages are provided by the drill supporting device of the invention which in its preferred embodiment includes a rock drill supporting cylinder having fluid pressure operated telescoping wall-engaging end members, clamp means to immobilize the wall-engaging end members against inward movement, and means for attaching the cylinder to the bucket of a mucking shovel or the like.

The invention will be more particularly described with reference to the illustrative embodiments of the invention shown in the accompanying drawings, in which:

Fig. 1 is a front view of the drill supporting device attached to the bucket of an overhead shovel;

Fig. 2 is an enlarged fragmentary view of the supporting cylinder showing the telescoping wall-engaging end members;

Fig. 3 is side view of a shovel bucket with the drill supporting cylinder attached;

Fig. 4 is a lateral view of the shovel with the drill supporting assembly in operating position;

Fig. 5 is a plan view of the drill supporting device of the invention positioned to drill at right angles to the direction of a mine tunnel; and

Fig. 6 is an enlarged fragmentary side view of the drill support attaching mechanism.

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In mining and rock tunneling in accordance with methods in common use today rock drills and their corresponding supports and power supplies are brought forward to the end of the mine or tunnel where series of holes are drilled at various levels, angles and depths. When this is accomplished the drills, their supports or frames and power supplies are removed from their forward positions to out of the way places which often requires their complete removal from the tunnel or mine until it has been cleared of the muck pile produced by the blasting charges inserted in the drilled holes. By the use of the rock drill supporting device of the invention the muck pile removing vehicle may be converted into a drilling machine supplying the power required to position and hold the drill support in operating position, eliminating the necessity of using different machines for drilling and mucking in the confined space of mines and tunnels where simplicity and ease of operation is of the greatest importance. In particularly narrow tunnels the loader may be used for positioning the rock drill supporting device and after the wall-engaging pistons have been extended and engage the walls of the drift the drill mount could be disconnected from the shovel bucket and the loader moved back out of the way while the drilling is in progress, providing more room for the drill operators.

Referring particularly to Figs. 3, 4 and 5 of the drawings, 10 is a mucking shovel of the type shown in U. S. Patent 1,960,000 with an overhead shovel bucket 11. At the forward edge of the bucket 11 is attached the drill supporting device 12 of the invention. The drill supporting device 12, as more fully illustrated in Figs. 1 and 2, consists of a hollow drill supporting cylinder 13 with fluid pressure inlet 14, fluid velocity restricting plug 14a to limit the speed of piston movement, fluid pressure relief holes 15, piston stop clamps 16 and split cylinder mounting clamps 17. Slidably mounted within the ends of the drill supporting cylinder 13 are pistons 18 having wall engaging ends 19 and piston rings 20.

The drill support 12 is rigidly clamped at the forward edge of the shovel bucket 11 by hooked turnbuckle coupling elements 23 which consist of hooked rods 24, and connecting links 25. The drill support 12 may be attached by the use of other coupling means in place of the hooked turnbuckle elements 23, such as bolts or chains passing through the eyes 17b in the split cylinder mounting clamps 17 and engaging at their lower ends the flanged corners 11c of the bucket 11.

In order to convert and operate the mucking

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shovel 10 as a drill rig, drill supporting cylinder 13 is positioned crosswise of bucket 11 in such a manner that the cylinder is supported by digging lip 11a and side edges 11b of the shovel bucket. Bolts 17a of split cylinder mounting clamps 17 are loosened and the bands are positioned on either side of the bucket lip 11a so that the eyed extension arm 17b overhang the front edge of the shovel bucket 11. Bolts 17a are tightened and the upper ends of hooked coupling turnbuckles 23 are inserted in eyes 17b while the other ends are securely engaged under the lower flanged corners 11c of the bucket 11, as shown in Figs. 1 and 6.

Next the fluid pressure line, not shown, is connected to the inlet port 14 of cylinder 13 and the rock drill 26, and its guide shell 27 are mounted upon the supporting cylinder 13 in a manner well known in the art.

Mucking shovel 10 is then positioned within the mine or tunnel. This positioning may involve any combination of the following movements; the bucket 11 with the attached drill supporting mount 12 may be raised or lowered to the proper drilling level by the bucket hoist on the loader 10 as shown in Figs. 3 and 4; the upper deck 10a of the loader may be pivoted to the desired angle as illustrated in Fig. 5; and the loader 10 may be advanced or retracted. At the desired height and angle fluid pressure is supplied to the cylinder 13 to force the wall-engaging pistons outwardly in the supporting cylinder 13 until the walls of the drift are engaged by the wall-engaging end members 19. In order to prevent the wall engaging pistons 18 from moving inwardly during the drilling operation, split piston stop clamps 16 are locked at each end of the cylinder by means of bolts 16a which pass through holes provided in the stop clamps 16.

The clamping device herein shown and described by way of example may be substituted by any equivalent adjustable means acting between the cylinder and the piston to prevent relative movement there between, for example, wedged sleeves, locking pins, or set screws. Instead of using the piston locking means described above or in addition thereto, the upper and lower decks of the loader 10 may be locked together as by placing a pin between them, the thrust from the drill being then transferred through the loader to the mine rails.

From the foregoing description it will be seen that the present invention provides a rock drill supporting device that can be readily attached to and removed from the bucket of a mucking shovel. It will be evident that various modifications may be made in the construction of the device and in the form of the means for attaching the supporting device to the shovel bucket

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without departing from the principles of the invention.

The invention provides a drill supporting device and a mining machine including the drill supporting device mounted on the bucket of a mucker shovel whereby the aims, objects and advantages of the invention are fully accomplished.

We claim:

1. A rock drill supporting and positioning device adapted to be mounted on a power operated material handling machine having a horizontally and vertically movable loading head including a shovel bucket having at least one digging tooth projecting from the leading edge thereof, comprising a drill supporting cylinder adapted to be supported by the lateral side edges of the shovel bucket, and clamping means engaging the cylinder and the lower edge of the shovel bucket to maintain said cylinder in contact with the lateral side edges and the digging tooth of the shovel bucket.

2. A rock drill supporting and positioning device adapted to be mounted on a power operated material handling machine having a horizontally and vertically movable loading head including a shovel bucket having at least one digging tooth projecting from the leading edge thereof, comprising a drill supporting cylinder adapted to be supported by the lateral side edges of the shovel bucket, and clamping means cooperating with the shovel bucket and said drill supporting cylinder for detachably mounting said cylinder to the shovel bucket, said clamping means comprising at least two ring clamps secured to the drill supporting cylinder, angular extension arms provided on said ring clamps adapted to overhang the leading edge of the shovel bucket, and coupling means engaging the angular extension and the lower edge of the shovel bucket to maintain said cylinder in contact with the lateral side edges and the digging tooth of the shovel bucket.

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