

April 18, 1933.

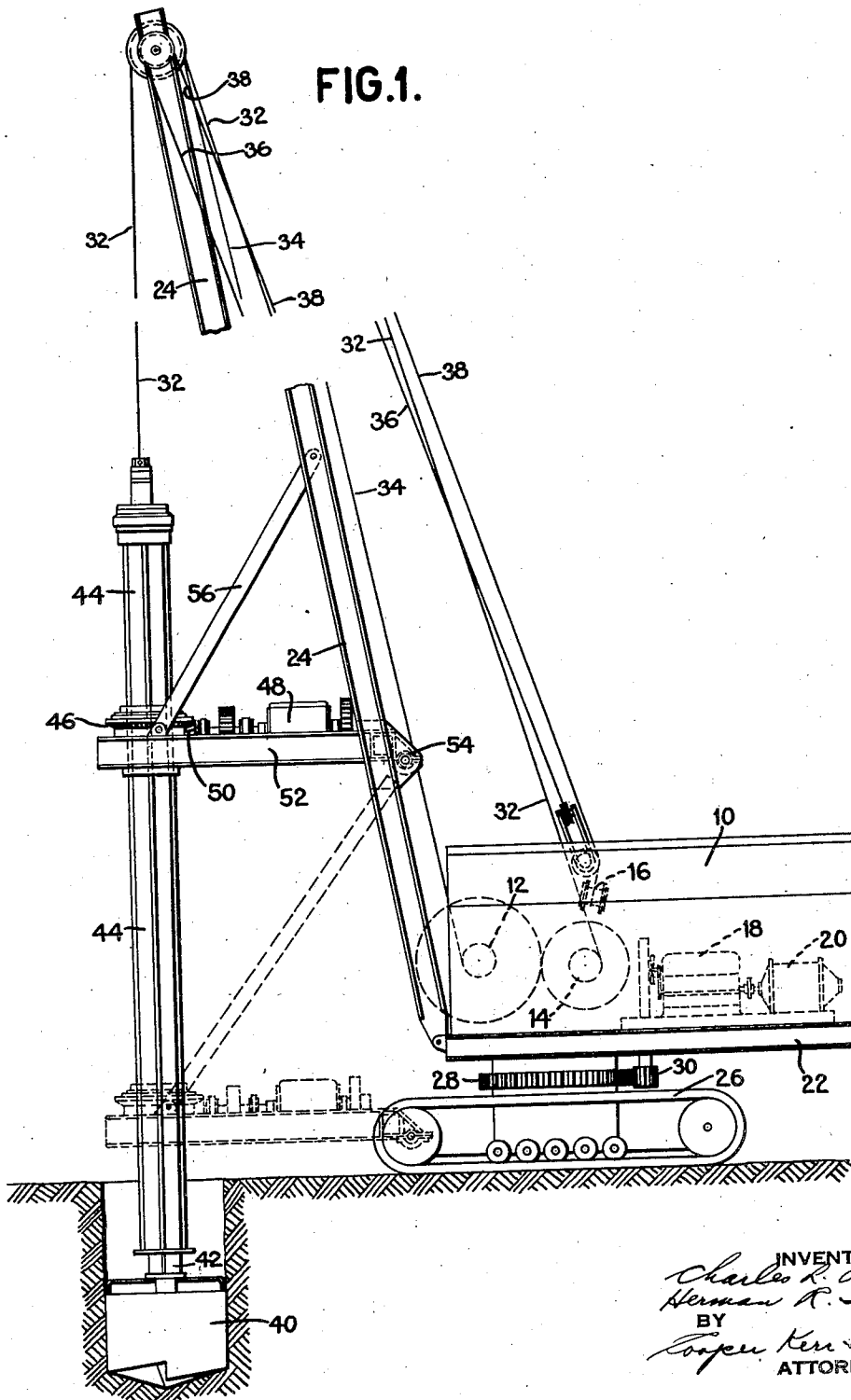
C. L. POWELL ET AL
EARTH BORING APPARATUS

1,904,249

Filed May 6, 1932

2 Sheets-Sheet 1

FIG. 1.



INVENTORS
Charles R. Powell
Herman R. Smith
BY
Cooper, Kerr & Dunham
ATTORNEYS

April 18, 1933.

C. L. POWELL ET AL

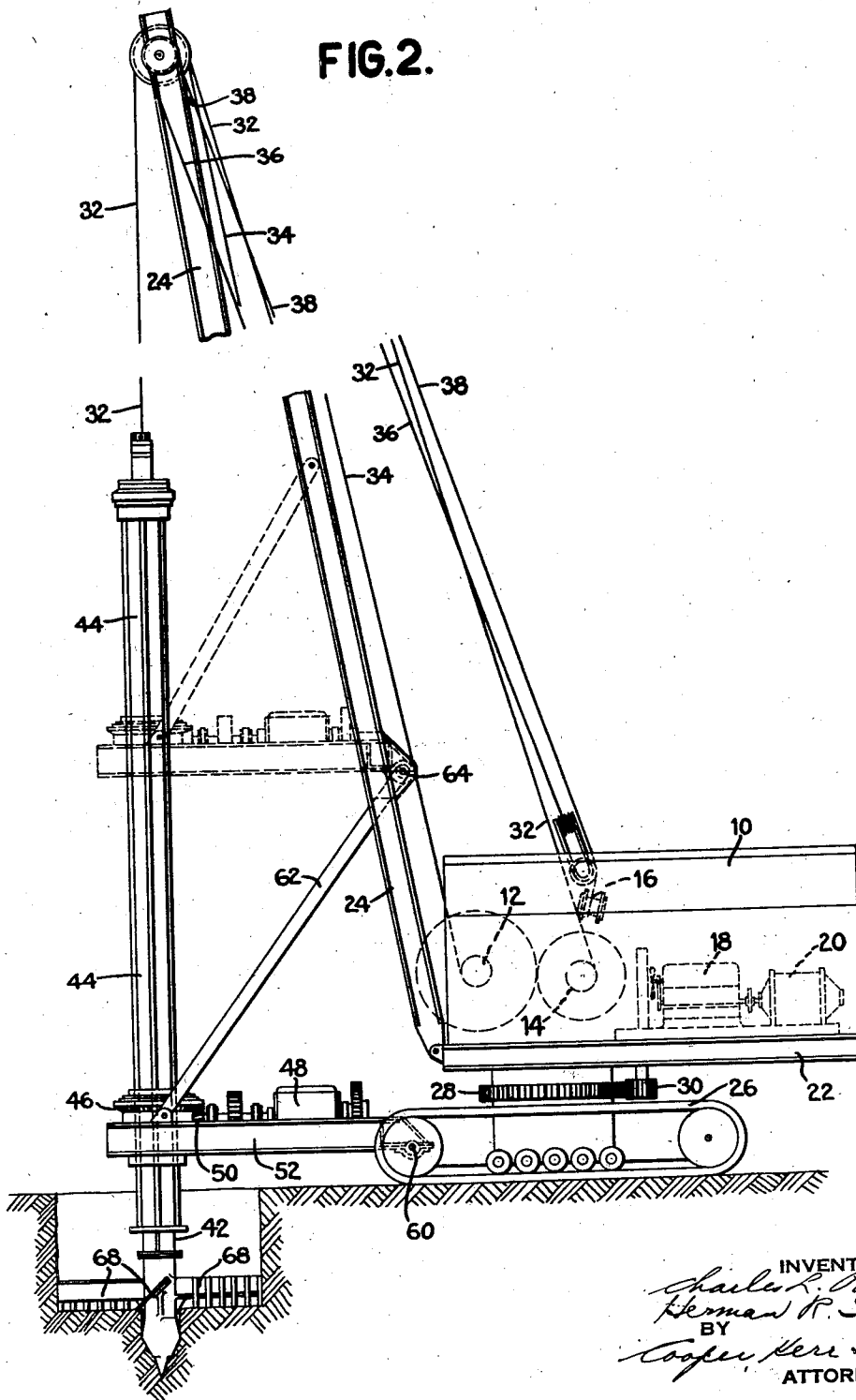
1,904,249

EARTH BORING APPARATUS

Filed May 6, 1932

2 Sheets-Sheet 2

FIG. 2.



INVENTORS

Charles L. Powell
Herman R. Smith
BY
Cooper, Kerr & Sturges
ATTORNEYS

UNITED STATES PATENT OFFICE

CHARLES L. POWELL, OF NEW YORK, AND HERMAN R. SMITH, OF DOUGLSTON, NEW YORK, ASSIGNORS TO CAISSON CONTRACTING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

EARTH BORING APPARATUS

Application filed May 6, 1932. Serial No. 609,668.

It has been customary in the earth-boring art to support boring tools and their driving means on rotatable cranes mounted on tractors. The boring apparatus has been carried by the boom of the crane, and at a height from the ground sufficient to permit swinging a loaded bucket to a discharge position above a motor truck or elevated hopper.

In some boring or drilling operations, in which the detritus is washed out of the hole by flow of water, it is unnecessary to elevate a bucket for dumping purposes.

In some kinds of drilling, the amount of power required for rotating the tool is so great that it is impractical to take the torque reaction on the boom of the crane.

An object of the present invention is to provide ways and means for increasing the range of usefulness of the entire apparatus by adapting it to support the tool-rotating means either at an elevated position on the rotatable part of the crane whenever it is necessary to swing a bucket above a truck, or on the non-rotating part of the crane structure whenever excessive driving torque must be resisted. The latter position may also be used to advantage when water flow is used for removing the cuttings.

Further and other objects and advantages will be apparent from the specification and claims, and from the accompanying drawings which illustrate what is now considered the preferred embodiment of the invention.

Fig. 1 shows the apparatus in operative position with the drive motor, gearing, etc., mounted on the rotatable part of the crane, the optional position of those parts being shown in broken lines.

Fig. 2 shows the apparatus in operative position with the drive motor, gearing, etc., mounted on the ground-gripping part of the crane, the other optional position of those parts being shown in broken lines.

In the drawings, the cab of the crane is designated 10. It contains winding drums 12, 14, 16, an engine 18, and a generator 20. Mounted in usual manner on beams 22 which support the cab and its machinery is boom 24. The above apparatus is rotatable on caterpillar tractor 26 by means of gear 28

and pinion 30. The usual hoisting and control cables 32, 34, 36 and 38 are provided, passing around their respective drums.

In Fig. 1, rotary bucket 40, shown in the hole in the ground, is rotatable through the instrumentality of telescopic kelly 42, 44, by gear 46, which, in turn is driven by motor 48 through a train of gears including pinion 50. The above rotating apparatus is all supported on frame 52, mounted at 54 on boom 24 of the crane. Stay-rods 56 provide support for the outer end of frame 52, being attached at their upper ends to boom 24. With the above described hook-up it is possible to raise the bucket well above the ground level, and to swing the crane to place the bucket in discharge position above a motor truck or an elevated hopper.

In Fig. 2 the kelly rotating means is supported from the non-rotatable part of the crane, preferably from an axle 60 or other substantial member of the ground-gripping structure. Stay-rods 62 extend from the outer end of frame 52 to a point 64 on boom 24. In this modification of the apparatus a scarifying tool 68 is shown on the lower end of the kelly, instead of the bucket 40 as in Fig. 1. With this kind of digging tool the detritus is usually carried out of the hole by flow of water, therefore it is never necessary to raise the tool to an elevation above the truck, thus permitting the torque reaction to be taken on the non-rotating, ground-gripping portion of the machine. This location of the rotating means enables more power to be applied to the tool and incidentally enables the same length of kelly bar to dig a deeper hole.

It will be appreciated that hoisting cable 32 is available to the operator for moving the rotating means from either of its operative positions to the other.

It is to be understood that the invention is not limited to the specific embodiment herein illustrated and described, but may be used in other ways without departure from its spirit as defined by the following claims.

We claim:

1. Apparatus for boring into the ground with rotary tools, comprising in combina-

tion; a crane having a non-rotatable ground-gripping structure with a rotatable structure mounted thereon; means for rotating rotary tools; and means on the ground-gripping and rotatable portions of said crane for operatively supporting the rotating means on either at the will of the operator.

2. Apparatus for boring into the ground with rotary tools, comprising in combination; a crane having a non-rotatable ground-gripping structure with a rotatable structure mounted thereon; means for rotating rotary tools; means on the ground-gripping and rotatable portions of said crane for operatively supporting the rotating means on either at the will of the operator, and hoisting means carried by said crane for moving said supporting means from one of said positions to the other, substantially as described.

3. In combination, a tractor, a boom rotatably mounted thereon, rotary earth boring apparatus, and supporting means on the tractor and boom for supporting the earth boring apparatus in either position at the will of the operator.

In testimony whereof we hereto affix our signatures.

CHARLES L. POWELL.
HERMAN R. SMITH.