

July 31, 1951

C. W. KANDLE
DRILL RIG

2,562,276

Filed July 14, 1945

3 Sheets-Sheet 1

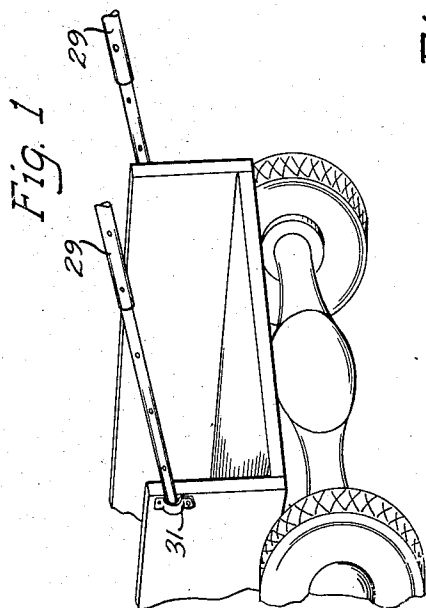
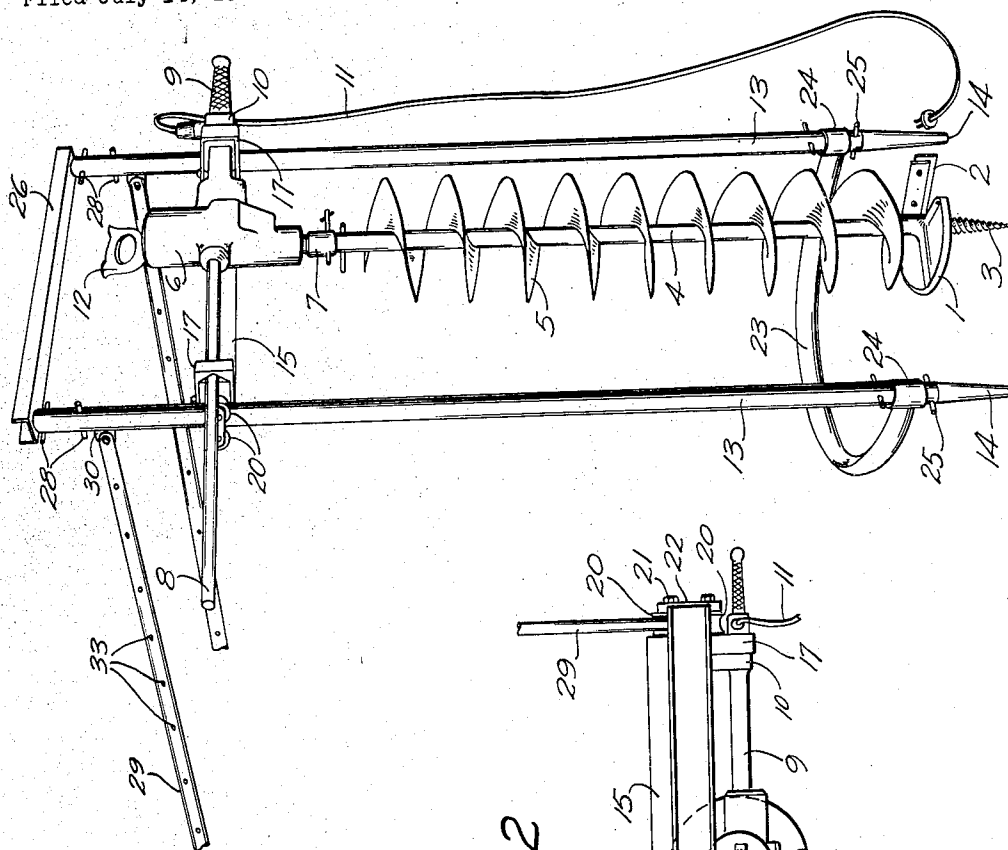


Fig. 2

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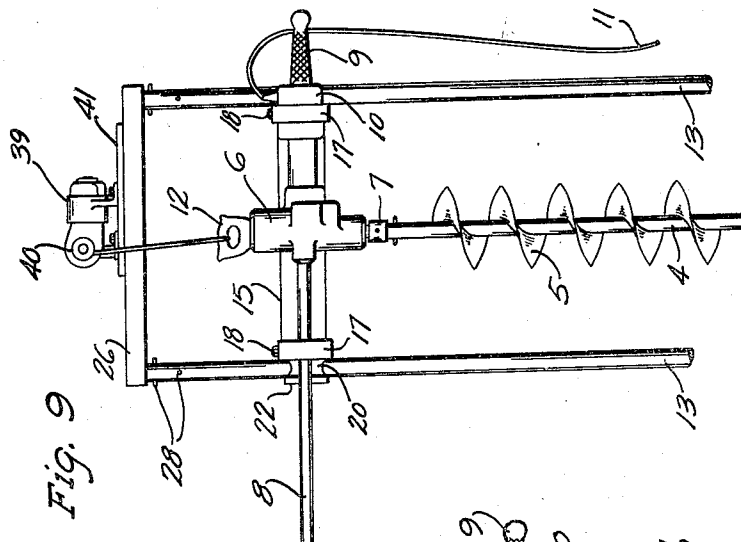


Fig. 9

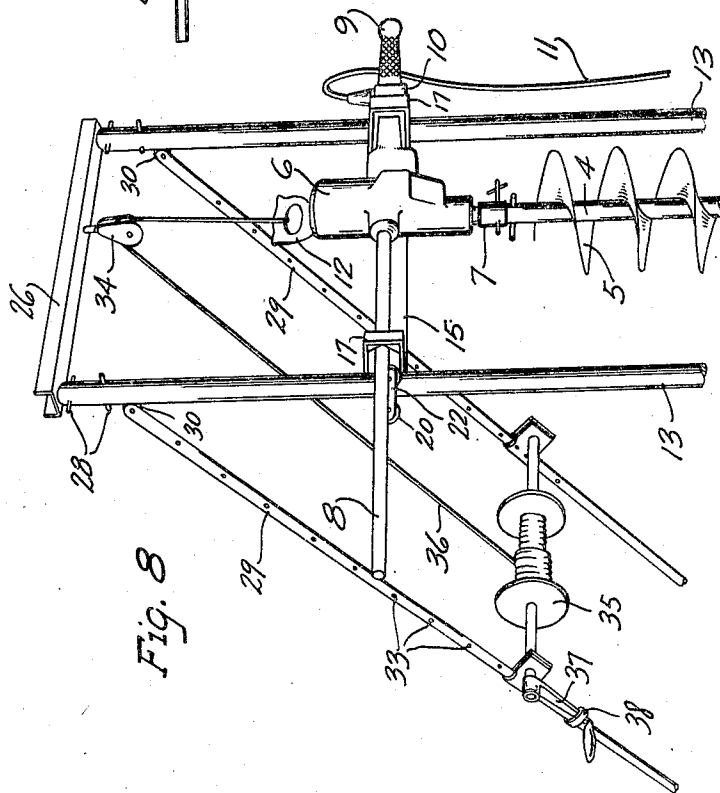


Fig. 8

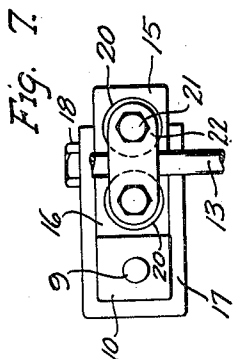


Fig. 7

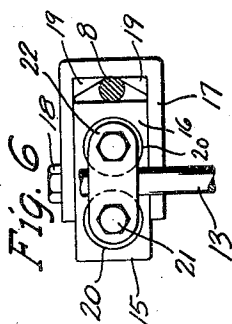


Fig. 6

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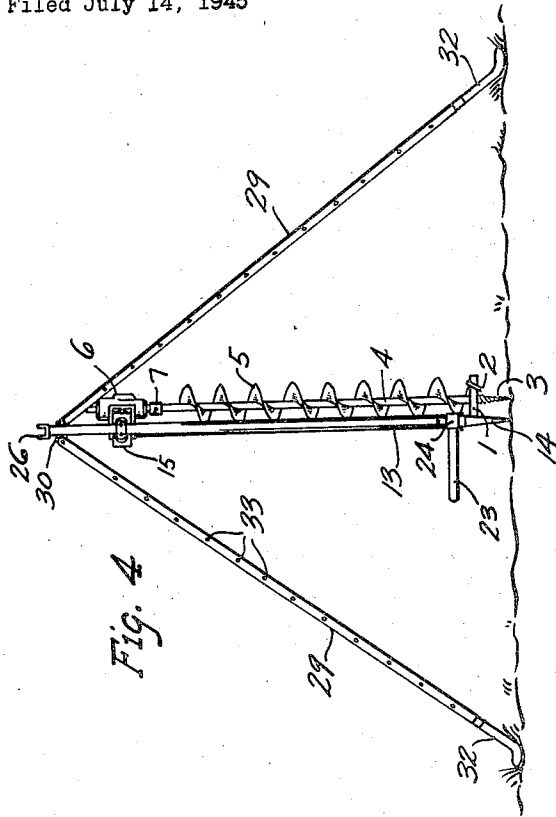


Fig. 4

Fig. 5

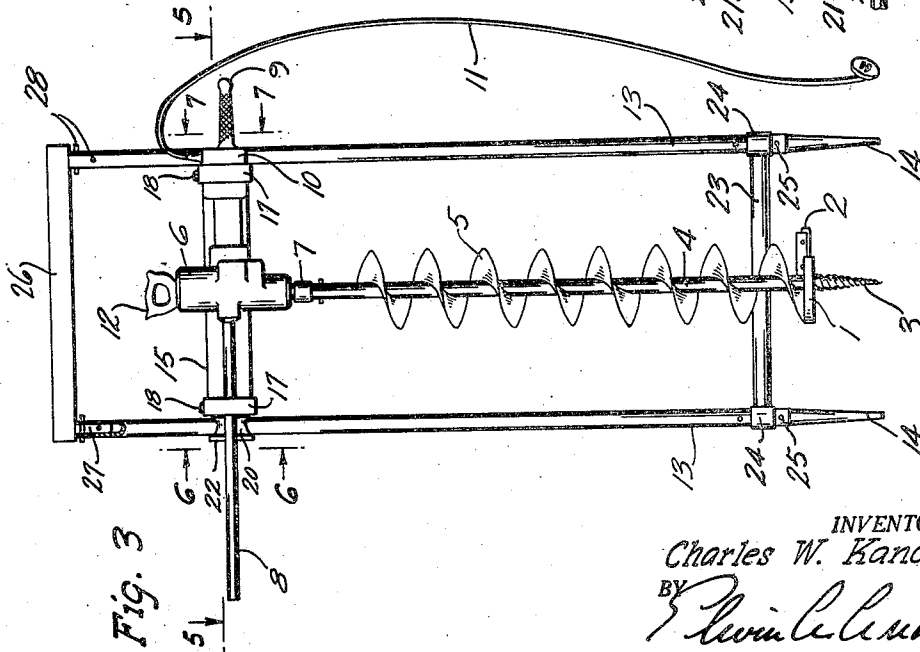
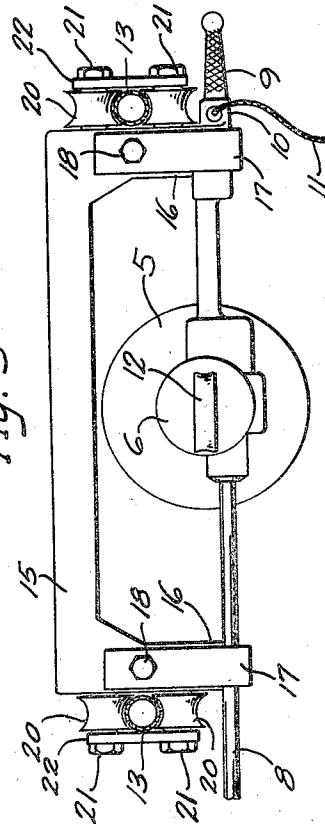


Fig. 3

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UNITED STATES PATENT OFFICE

2,562,276

DRILL RIG

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Application July 14, 1945, Serial No. 605,032

2 Claims. (Cl. 255—19)

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This invention relates to a drill rig for supporting and holding portable earth drills in the digging of post holes and the like.

The principal object of the invention is to provide a rig which will hold a portable earth drill of the general type of that set forth in United States Patent No. 2,320,612 while the same automatically drills a hole in the ground.

Another object of the invention is to relieve the operator of the torque load in holding a portable rotary earth drill.

Another object is to provide a rig which is foldable and portable and which can be set at practically any location for drilling holes both perpendicular and at an angle.

Another object is to provide a rig which can be extended from a truck or boom to hold a drill at a distance therefrom.

Another object is to provide a simple track construction for guiding a rotary drill in digging a hole in the ground.

Another object is to provide a drill in combination with a rig that will automatically cut its way into the ground guided by the rig.

Another object is to provide a portable rig that serves to positively guide the drill in its operation and that can be used as a derrick for lifting the drill from the ground.

Another object is to provide a rig which controls the rate of drilling where heavy drills are employed and which provides a simple and rapid system for unloading the dirt from the flights without removing the drill from the hole.

Other objects and advantages will be set forth in connection with the description of an embodiment of the invention illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of the rig and drill in use;

Fig. 2 is a top plan view of the rig and drill;

Fig. 3 is a front elevation of the same;

Fig. 4 is a side elevation showing the braces supported on the ground;

Fig. 5 is a horizontal section taken on line 5—5 of Fig. 3 just above the carriage;

Fig. 6 is a vertical section taken on line 6—6 of Fig. 3 and showing the construction of the end of the carriage for holding one arm of the motor;

Fig. 7 is a similar section on line 7—7 of Fig. 3 at the other end of the carriage;

Fig. 8 is a detail enlarged view showing one form of windlass construction; and

Fig. 9 is a partial front elevation showing another form of windlass construction.

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The drill illustrated is of the rotary type and comprises a substantially flat drill head 1 with an open sector having a radial cutting blade 2 set at an angle therein, with a central lead screw 3, a vertical drive shaft 4 having a spiral flight 5 welded thereto and extending upwardly from the head 1, and a motor 6 mounted on the upper end of shaft 4 and having a drive coupling 7 for driving the drill from the motor.

The coupling 7 may be disconnected to provide for removal of the motor from the drill and facilitate portability of the same.

The motor 6 has two opposite laterally extending handles or arms 8 and 9, respectively, generally employed for manual guidance of the drill and preventing turning of the motor housing instead of the drill. The arm 8 is a round rod extension removably coupled to a short rod-like handle on the motor housing. Arm 9 is generally a cast handle on the motor housing and contains a switch box or housing 10 to which is connected the electrical conduit 11 for supplying current to the motor.

A top handle 12 is also provided on the motor housing to facilitate handling.

The rig is adapted to take the place of manual holding the motor 6 against turning, and comprises a pair of upright posts 13 having pointed lower ends 14 adapted to be driven into the ground on opposite sides of the location for the hole to be drilled, and a carriage 15 bridging the space between the posts and adapted to ride down the posts along with the motor 6 as the drill cuts its way into the ground.

The carriage 15 constitutes a floating cross member having ends 16 disposed at right angles thereto and to which the corresponding arms 8 and 9 are suitably clamped by U-shaped clamps 17 which pass over the top and bottom of the respective ends and are secured thereto by removable tapered pins or bolts 18 extending downwardly through the ends 16.

The clamp 17 which secures arm 8 preferably has a pair of tapered blocks 19 in its corners serving to center the arm 8 relative to the corresponding end 16. The clamp 17 which secures arm 9 preferably passes around the rectangular switch housing 10 which has the same vertical dimension as the respective end 16.

The carriage 15 is secured to the posts 13 by means of a pair of rollers 20 mounted on stub axles 21 secured to each corresponding end 16 and adapted to embrace the respective post. A cross member 22 secures the outer ends of axles 21 in place.

The carriage 15 is supported by the motor arms 8 and 9 and rides on posts 13 as tracks when the motor moves downwardly with the drilling operation.

The posts 13, in addition to being held by points 14, are rigidly held in parallel spaced relation by a curved cross member 23 having end cylindrical heads 24 through which the corresponding posts pass. The heads 24 are supported by the tapered pins 25 which removably secure points 14 to the corresponding posts 13.

A top cross member 26 of channel iron has downwardly extending cylindrical end members 27 which fit into the upper ends of the hollow tubular posts 13 and tapered pins 23 secure the posts thereto.

The rig is held in vertical position or at a predetermined angle by means of one or more laterally extending braces 29 for each post 13. The braces 29 are pivotally pinned to corresponding brackets 30 secured to the posts near the upper ends thereof.

Where a single brace 29 is employed for each post the outer end of the brace is provided with an adapter or clevis 31 for securing the same to an eye on a truck or on a boom. Various adapters 31 may be employed depending upon the member to which the brace is to be fastened. For telephone line installations the adapters 31 are constructed to secure to the rear end of a service truck as illustrated in Fig. 1.

Where a double brace 29 is employed for each post, as illustrated in Fig. 4, the braces extend in opposite directions and have pivotal feet 32 thereon for supporting the same on the ground and preventing slippage.

The braces 29 are preferably extensible and each is constructed of a rod member telescoped by a tubular member. A series of spaced holes 33 are provided in either member to register with one or more holes in the other for receiving a tapered pin adapted to secure the members in fixed relation and provide a predetermined adjusted length for the brace.

The rig may be used as a derrick for hoisting the drill from the hole and for other purposes, if desired.

As illustrated in Fig. 8, pulley 34 is swivelly suspended from the center of cross member 26 and a windlass drum 25 is removably clamped to the braces 29. A cable 36 is wound on the drum 35 and passes over pulley 34 for lifting operations. The drum 35 has a crank 37 for turning the same and a lock 38 for securing the same against turning.

The power windlass shown in Fig. 9 comprises a small reversible electric motor 39 connected by a worm gear to drive a short drum 40, and the unit is mounted on a platform 41 detachably secured on top of the upper cross bar 26.

The rig is quickly assembled and disassembled and the parts are light in weight and readily portable. They can be assembled at one site and transported to another in semi-assembled relation as where a series of holes are to be drilled.

The windlass attachment provides a means whereby a heavy drill may be raised to position during assembly and may be partially supported by the cable during drilling so as to control the rate of drilling by avoiding too much weight on the head 1 and blade 2, and thereby avoiding stalling of the motor 6.

The soil may be quickly removed from the hole without removing the drill. This is accomplished by lifting the drill slightly with the windlass while leaving the motor 6 operating, thereby rapidly spinning the drill and its spiral flights so that the dirt thereon is quickly raised to the top and thrown radially clear of the flights. When the flights are thus cleared the drill is again lowered to cutting position and the actual rate of rotation of the drill is governed by the type of soil encountered and the weight of the drill and motor applied to the head.

Various embodiments of the invention may be employed within the scope of the accompanying claims.

I claim:

1. In combination, a portable earth drill unit comprising a drill shaft carrying a drill head at its lower end, a spiral flight extending upwardly along the shaft and a motor disposed on the upper end of the shaft for rotating the same, said motor having a pair of opposite laterally extending arms secured thereto to assist in guiding said drill unit, a separately portable drill rig unit comprising a frame adapted to be supported on the ground and to be secured against movement during drilling, said frame providing a pair of substantially vertical tracks on opposite sides of the drill unit, and roller means secured to each of said arms engaging said track during drilling operations whereby the force of the motor torque is absorbed by the frame to prevent rotation of the motor bodily relative to the frame.

2. In combination, a portable earth drill unit comprising a drill shaft carrying a drill head at its lower end, a spiral flight extending upwardly along the shaft and a motor disposed on the upper end of the shaft for rotating the same, said motor having a pair of opposite laterally extending arms secured thereto to assist in guiding said drill unit, a separately portable drill rig unit comprising a frame adapted to be supported on the ground and to be secured against movement during drilling, said frame providing a pair of tracks on opposite sides of the drill unit and adjustable angularly of the ground to provide for selected vertical and angular drilling operations, roller means secured to each of said arms engaging said track during drilling operations whereby the force of the motor torque is absorbed by the frame to prevent rotation of the motor bodily relative to the frame, and a cable hoist carried by said frame above the drill unit for lifting the latter from a drilled hole in the ground.

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