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2,524,262

DRILL GUIDE

Filed March 24, 1947

2 Sheets-Sheet 1

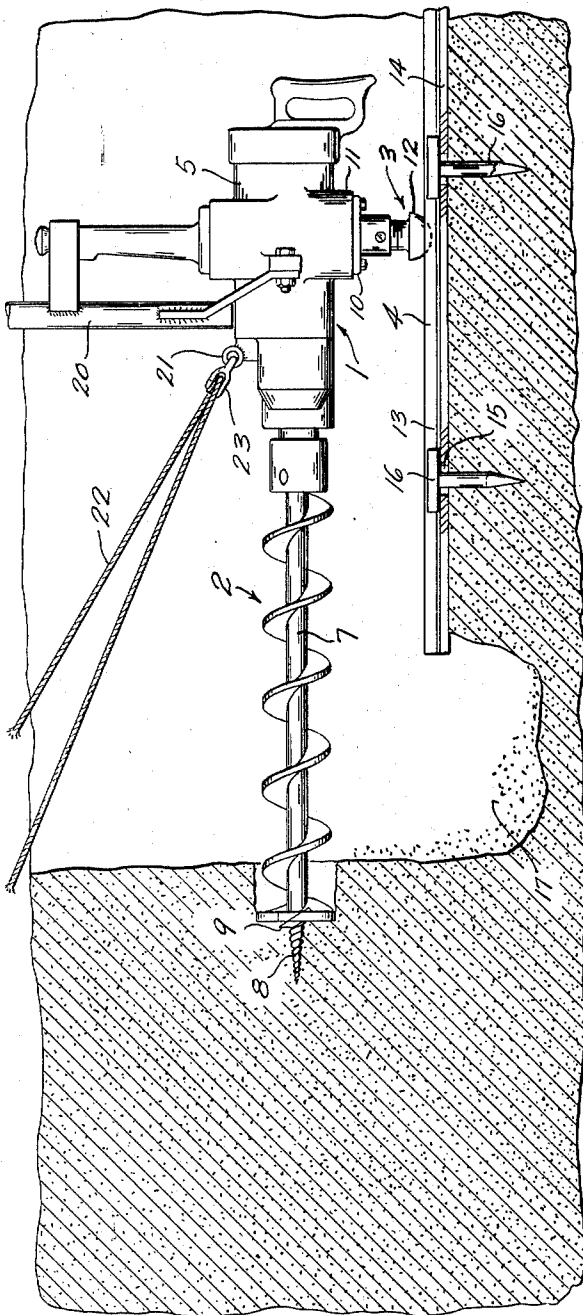


Fig. 1

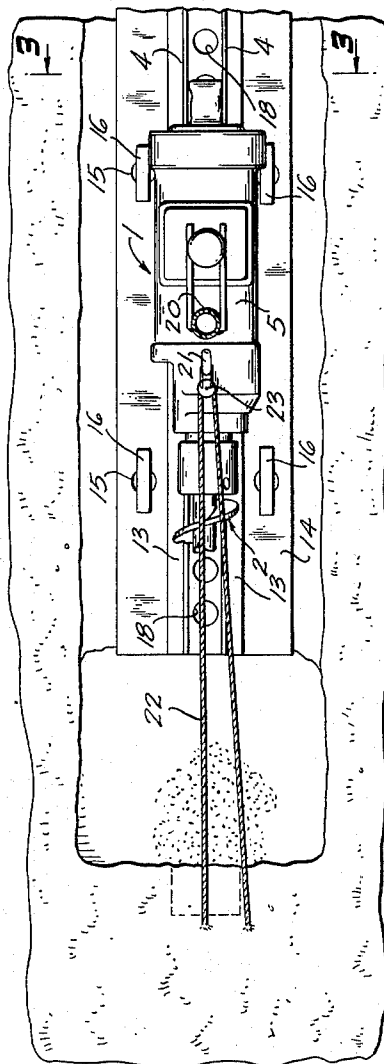


Fig. 2

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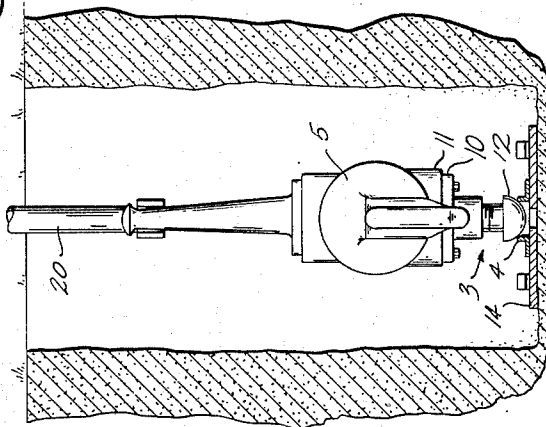
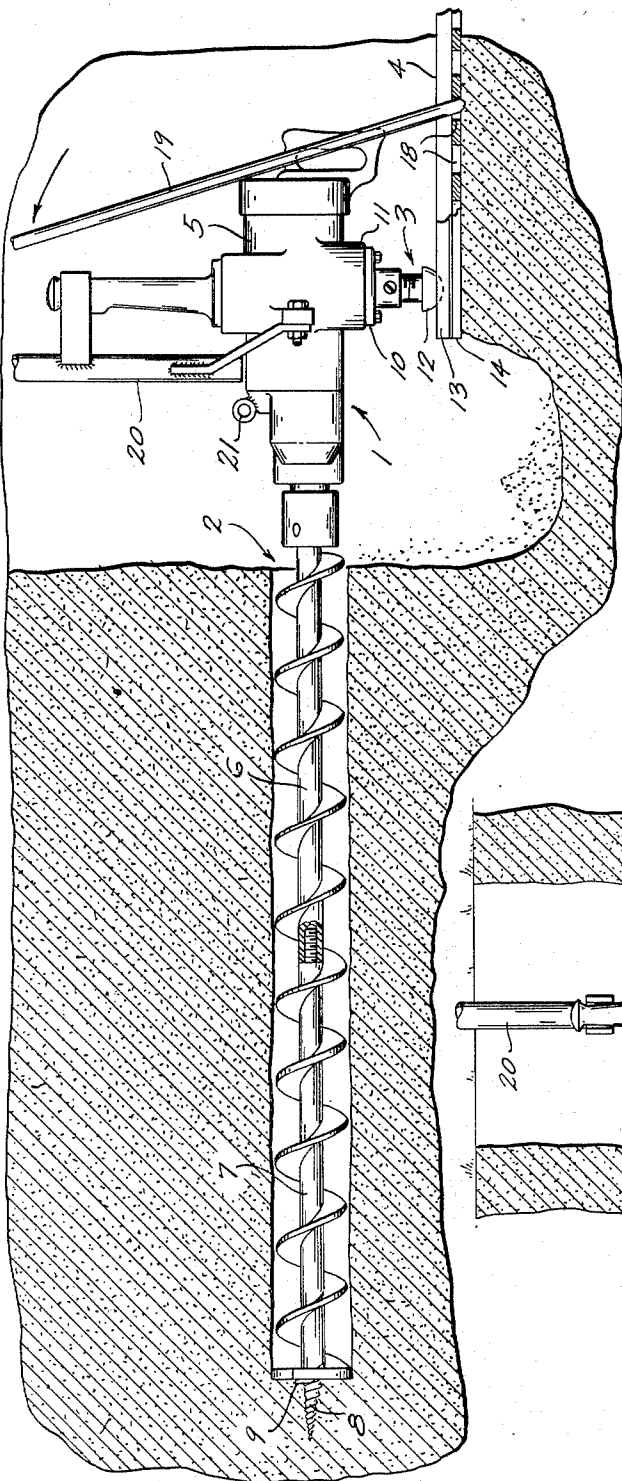
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2 Sheets-Sheet 2



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DRILL GUIDE

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2 Claims. (Cl. 255—20)

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This invention relates to an earth-boring apparatus.

The object of the invention is to provide an apparatus for supporting an earth-boring drill in position for horizontal drilling under sidewalks, pavements and the like, or into embankments.

Another object of the invention is to provide a drill rig which will support an earth-boring drill in a limited space, such as in the bottom of a ditch.

Another object of the invention is to provide means for positioning an earth-boring drill in an excavation for boring long holes into the embankment thereof, and having means whereby the drill can be easily guided from above the excavation and provided with simple positive means for feeding or withdrawing the drill from the hole.

Another object of the invention is to provide simple means for drilling into embankments which will maintain the alignment of the drill in a predetermined direction.

Another object of the invention is to provide an assembly for supporting and feeding an earth-boring drill for drilling horizontal holes under sidewalks, pavements and the like, which is light in weight, strong and durable, easy to transport and install, trouble-free, easy to operate and may be manufactured at low cost.

A preferred embodiment of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of a drill in position and in operation, shown in the bottom of an excavation, the ground being broken away and sectioned;

Fig. 2 is a plan view of the drill mounted on the track;

Fig. 3 is a cross-sectional view of the carriage and track on which the drill is fed, taken on line 3—3 and at right angles of Fig. 2; and

Fig. 4 is a schematic view showing the method of feeding the drill.

The invention comprises a portable electric or air motor 1 having an extensible earth-boring drill 2, a carriage 3 on which the motor 1 is mounted, a track 4 upon which the carriage rides for feeding or withdrawing the drill, and means for controlling the feeding and reverse-feed of the drill.

The drill 2 is driven by the motor 1 mounted in the motor casing 5 and receiving its power from a portable generator unit, not shown.

The drill 2 comprises a plurality of shaft sec-

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tions 6 and a bit section 7 fitted with the lead screw 8 and blade 9. Each shaft section should be of substantially the same length. The sections are of tubular construction and have spiral convolutions for carrying the spoil away from the bit. Each shaft section is fitted at its ends to receive corresponding ends of adjacent sections so that any number of sections may be assembled together in driving connection with each other.

The carriage 3 upon which the motor 1 is mounted comprises a base plate 10 which is bolted to the base 11 of casing 5 and the metal pad 12 secured to the base plate 10. The underside of pad 12 is shaped to form a spherical section and is intended to ride on the two rails of track 4 to be described. The carriage 3 is detachably bolted to the base 11 of casing 5 to permit the motor 1 to be readily converted to other purposes.

The track 4 consists of two lengths of angle-irons 13 longitudinally mounted on a base support 14. The angleirons 13 are placed so that two edges of the irons are parallel and raised and of a certain distance apart to allow the pad 12 to ride thereon and be guided by the same. The base support 14 is a flat metal or other plate which rests upon the ground and supports the track 4 and the weight of the drill unit on the track.

Three interspaced holes 15 are drilled in the base support 14 along each side to receive the staking pins 16.

The pins 16 are pointed, metal T-pins and when extended through holes 15 and into the ground, they serve to secure the track 4 against movement or sliding.

The pad 12 slides along the track to provide the support and directional movement of the drill unit. The pad 12 is not obstructed by dirt or any spoil coming from the drill 2 and covering the track. Should any dirt rest on the track 4, the pad 12 readily pushes it out of the way.

The track 4 is installed simply by placing the same on ground leveled for the required clearance of and parallel to the hole to be drilled, staking the base support 14 with the pins 16 and placing the drill unit on the track.

The spoil from the drilling operations is discharged by flights 6 and 7 into a pit 17 disposed at one end of the ditch, and where the ditch is sufficiently wide, the dirt may be removed continuously from the pit either by manual shoveling or by suitable conveyor.

As the drill feeds forward in its operation and the drive unit reaches the forward end of track

4, the drive unit may be disconnected from shaft 6 or 7 and moved back to provide for the insertion of another shaft section for continued drilling.

When drilling horizontally under sidewalks or the like the feeding of the drill by the lead screw 8 is not supplemented by the weight of the drive unit and in most such instances the lead screw is unable to effect feeding alone. A plurality of holes 18 are drilled in the base 14 between the two angleirons 13 and evenly spaced along the length of the base. A lever bar 19 inserted in one of the holes 18 provides means for applying lever pressure against the motor casing 5 therewith, to effect an easy and positive feeding of the drill.

A long tubular handle 20 shown in Fig. 1 secured to the motor casing 5 extends vertically therefrom enabling an operator while standing on the top soil to guide the drill and hold the motor casing against the torque of the drill. A ring 21 is welded to the casing 5 near the handle 20 to which a rope 22 may be tied and used through the pulley arrangement 23 to move the drill for feeding, as also shown in Fig. 1.

In most instances horizontal holes are drilled in laying pipes or the like beneath sidewalks or streets and are drilled from within excavations alongside the sidewalk or street. In such instances the space afforded the operator for positioning the drill, effecting its feeding and traverse and removing the drill or interposing additional sections of the drill, is very limited. With the present invention the operations under such circumstances are facilitated and speeded.

The track and undercarriage require little additional clearance beneath the level of the hole to be drilled and no more horizontal clearance than is already required for the drill sections. When drill sections of various diameters are to be employed with the invention, carriage 3 may be made adjustable so that pad 12 is disposed below the center of motor 1 a distance sufficient to effect clearance of drill sections 6 above track 4.

Other embodiments of the invention may be carried out within the scope of the accompanying claims.

I claim:

1. An earth-boring apparatus for drilling horizontal holes and the like, comprising a track secured to a base member and having a pair of spaced parallel upstanding flanges constituting track members, a power drill unit having a pad secured beneath the same with a curved bottom surface disposed to ride upon said track members and to center the unit relative thereto while providing for lateral tilting of the unit to maintain the latter in alignment with the hole being drilled irrespective of deviations of the track from a course parallel to the hole, and an upwardly extending handle disposed for manual guidance of the unit along the track to feed the unit during drilling.

2. An earth-boring apparatus for drilling horizontal holes and the like, comprising a track secured to a base member and having a pair of spaced parallel upstanding flanges constituting track members, a power drill unit having a pad secured beneath the same with a curved bottom surface disposed to ride upon said track members and to center the unit relative thereto while providing for lateral tilting of the unit to maintain the latter in alignment with the hole being drilled irrespective of deviations of the track from a course parallel to the hole, and an upwardly extending handle disposed for manual guidance of the unit along the track to feed the unit during drilling, a series of abutments spaced longitudinally of said track intermediate said track members, and a lever disposed to be manually manipulated to engage successive abutments and said unit to pry the latter in the direction of feed.

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