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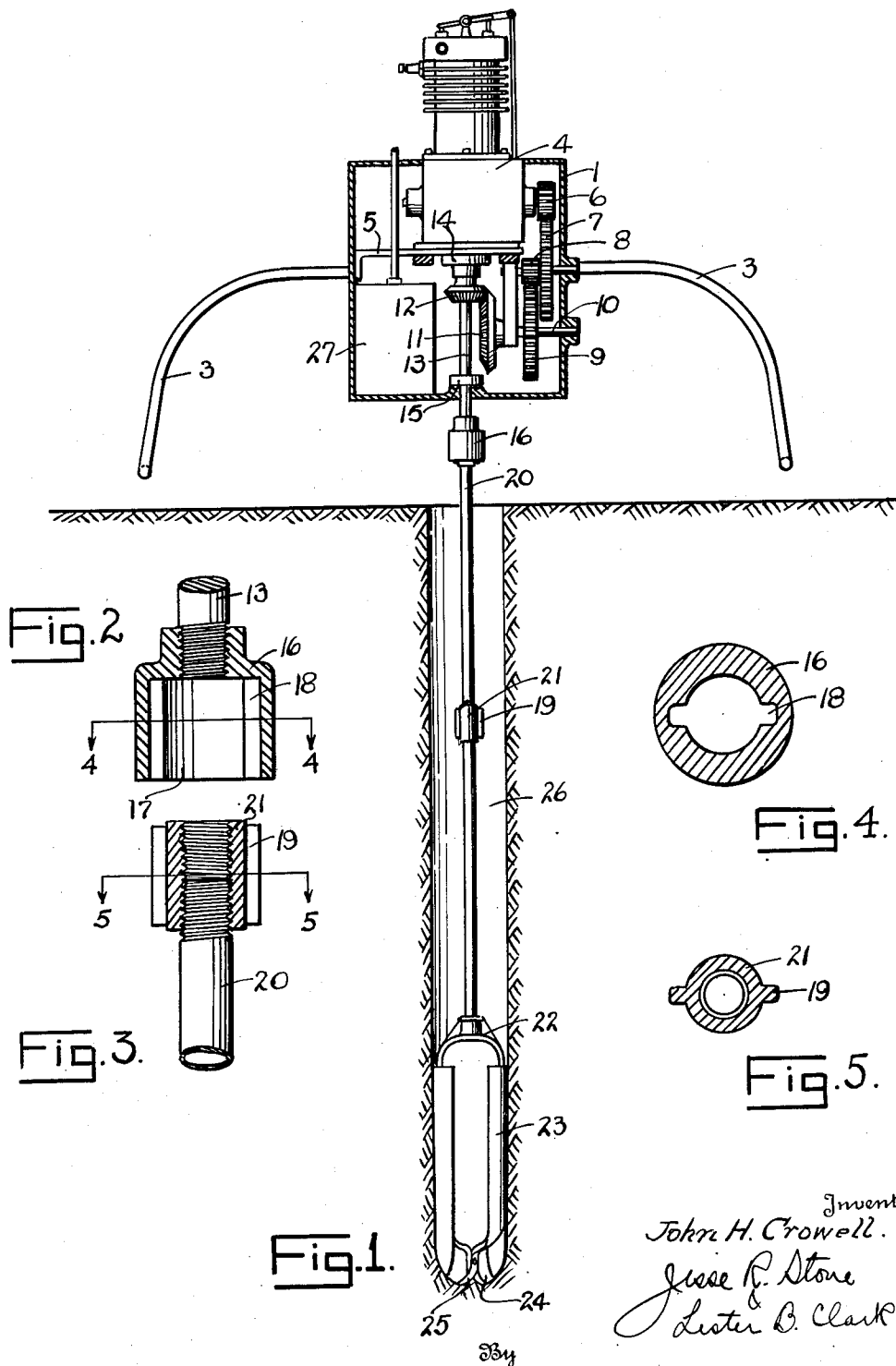
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2,016,667

PORTABLE EARTH BORING MACHINE

Filed Oct. 16, 1933

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

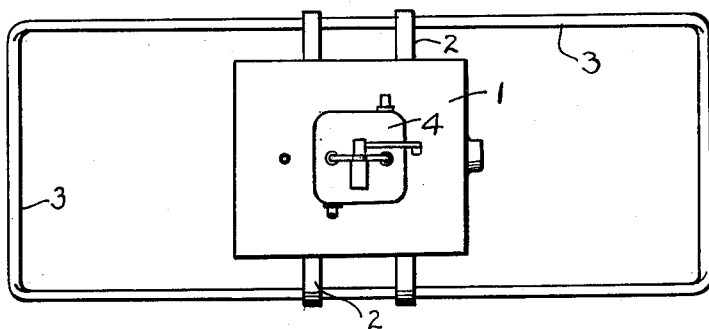


Fig. 6.

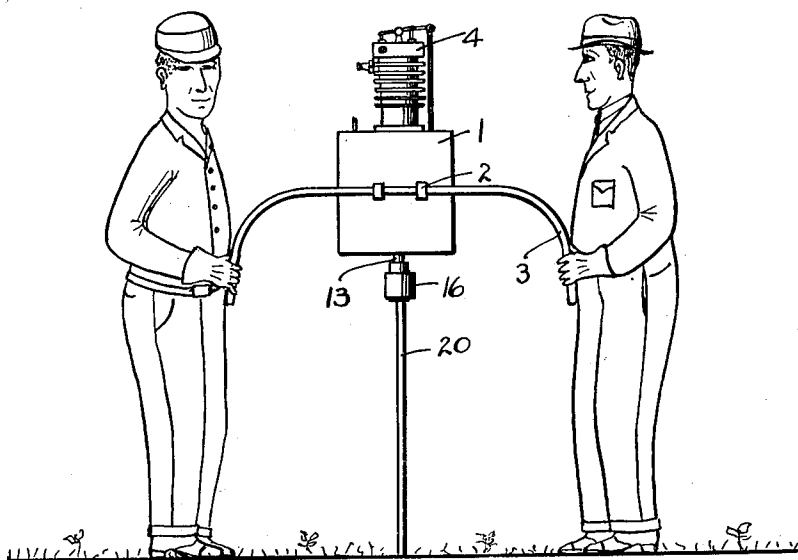


Fig. 7.

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## UNITED STATES PATENT OFFICE

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## PORTABLE EARTH BORING MACHINE

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3 Claims. (Cl. 255—67)

My invention relates to a portable machine for drilling holes in the earth. It has particular application to machines for drilling holes of comparatively shallow depth of from a few feet to a hundred feet or more.

My invention has as its object the provision of a portable drilling machine which may be moved and operated by one or more men.

I desire to provide a device which may be moved easily from place to place by the operators without the necessity of any vehicle or special means of transportation, and which may be positioned and the drilling operation accomplished without the necessity of any additional equipment aside from the machine itself.

I desire particularly to provide a machine in which the operator or operators may raise or lower the device in drilling and may add additional lengths of drill stem from time to time without the necessity of any draw works or cumbersome equipment such as is usually necessary.

I further desire to provide a drilling device in which the drill stem may be easily lengthened as the drilling proceeds and which may be removed from the well by the operator without the necessity of any extra equipment whatever.

In the drawings herewith, Fig. 1 is a side view partly in elevation and partly in section showing one embodiment of my invention.

Fig. 2 is a central longitudinal section illustrating a coupling employed at the upper end of the well.

Fig. 3 is a similar view showing the type of coupling employed to connect the sections together in the well.

Fig. 4 is a transverse section on the plane 4—4 of Fig. 2.

Fig. 5 is a similar section on the plane 5—5 of Fig. 3.

Fig. 6 is a top plan view of the assembled device; and

Fig. 7 is a side elevation illustrating the manner in which the device is supported and operated.

In the drawings, with particular reference to Fig. 1, it will be noted that the operating mechanism is housed within a housing 1, which may be rectangular in shape or of any preferred form, which is provided with lateral supports 2. With reference particularly to Fig. 6, it will be noted that the supports 2 are connected with a rectangular shaped frame 3, which answers as a handle or supporting member whereby the operators may control the operation of the machine. It will be noted in Fig. 1 that the lateral arms upon the frame are curved downwardly so as to

form at their outer ends a transverse member which may contact with the ground when the frame is lowered by the operator.

Within the housing 1, I contemplate the provision of a motor 4, which may be of any preferred form, and I contemplate the use of an internal combustion motor, which is supported within the housing upon a transverse bracket 5. The upper end of the motor may project above the housing as shown.

The drive shaft of the motor has thereon a gear 6, which is connected by intermediate gears 7 and 8 to the gear 9 mounted upon the shaft 10, supported in the housing for rotation. At one end of said shaft 10 is a beveled gear 11, which is operatively connected with a beveled gear 12 upon a downwardly extending drive shaft 13, said shaft being rotatable in upper and lower bearings 14 and 15 in the housing. The lower end of the shaft 13 projects through the lower wall of the housing and has thereon a chuck or coupling member 16.

The said coupling 16 is shown best in Fig. 2. It has its lower end approximately cylindrical at 17 but has two laterally extending keyways or channels 18 to receive keys or ribs 19 on the drill stem coupling, as shown in Fig. 3.

Each lower section of the drill stem may be of any desired length and I contemplate sections of three or four feet in length. These sections are made up of hollow tubular members 20, the ends of which are threaded to engage within a coupling 21 having lateral keys 19 thereon as previously noted. It will be understood that when a new section is added above a section 20, which is connected with the chuck 16, the lower end of the section will be screwed in the upper end 21 of the next lower section, the upper end of the new section being engaged within the chuck which is elevated a sufficient distance to be engaged over the upper end of said new section.

The lowermost section of the drill stem or rod is engaged with a drill bit or auger 22. This bit may be of any preferred construction and may be formed as is the ordinary post hole digger, but should preferably be of sturdy construction. I have shown a bit having two lateral blades 23, the lower ends of which are curved and sharpened at 24, each blade being curved and inter-fitted as shown at 25. Thus, when a sufficient amount of earth has been accumulated within 50 the bit or auger, it may be raised to the surface and the cuttings removed and the drill again inserted to the bottom of the hole.

My device is of particularly convenient and effective form so that it may be operated and has 55

the advantage that two operators can entirely conduct the drilling operation without the necessity of any further equipment. Thus, in the operation of drilling a hole, such as shown at 26 in the drawings, the operators will support the frame manually, in a position with the chuck 16 fitted over the drill stem. While the drill is being rotated by the mechanism disclosed, or any other desirable form of mechanism, the operators will exert sufficient downward pressure upon the frame to move the bit downwardly into the hole. While it is necessary to proceed slowly in the drilling operation, the weight upon the drill will be controlled easily by the two operators either raising upwardly on the frame or pushing downwardly with the desired force so that the bit will advance as desired.

When the hole has advanced sufficiently to necessitate the addition of another section of drill stem, the device may be supported upon the ends of the frame while the drillers obtain a new section of pipe and place it in condition for coupling in with the lower section. The new section may be screwed upon the old section of coupling 21 below and then the frame may be raised up and moved over above the new section so as to couple the chuck over the same and then the drilling may proceed.

When it becomes necessary to remove the drill stem so as to empty the cuttings from the bit, the frame is raised so as to remove the chuck from the upper section 20 of the drill stem and the frame may be supported at one side of the hole. The operators may then raise the bit from the hole manually by pulling the drill stem up until a coupling is reached and the said coupling may be unscrewed and the drill stem removed one section or more at a time until the bit can be removed and emptied of its cuttings.

It will be seen that with this device shallow holes and holes also of some depth can be drilled without any additional equipment. The whole operation of the device is manually controlled,

the only mechanism necessary being that to rotate the drill stem, and that is of portable nature. I may provide a gas tank 27 in the frame if desired from which the fuel supply may be conducted to the engine.

What is claimed is:

1. A portable drilling machine comprising a frame, a housing supported on said frame, a downwardly extending drive shaft on said housing, means in said housing to rotate said shaft, a chuck on said shaft including a cylindrical sleeve having opposed keyways therein, a drill bit, a sectional drill rod connected therewith to rotate the same, and couplings between the sections of said rod having lateral ribs, said couplings being formed to fit said chuck to engage said ribs in said keyways.

2. A portable drilling machine comprising a frame, laterally projecting handles on said frame adapted to engage the ground and support said frame when the machine is not drilling, a housing supported on said frame, a downwardly extending drive shaft on said housing, means in said housing to rotate said shaft, a drill rod, a coupling member thereon adapted to slidably interfit with said chuck, and an earth boring member on said rod, said frame being supported by said rod with said handles spaced above the ground in drilling.

3. A manually supported drilling machine comprising a frame having laterally extending handles, curved downwardly to furnish a support when desired, and serving as means whereby said frame may be moved vertically and laterally as desired, a downwardly extending drive shaft on said frame, a motor on said frame, operative connections between said motor and said shaft, a chuck on said shaft, a sectional drill rod slidably connected to said chuck for rotation and a boring tool on said drill rod, said frame being raisable by said handle to allow insertion of drill rod sections.

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