Aug. 22, 1961 J. T. KENDRICK 2,997,120

METHOD OF DRILLING WELLS AND APPARATUS THEREFOR

Filed Aug. 30, 1957

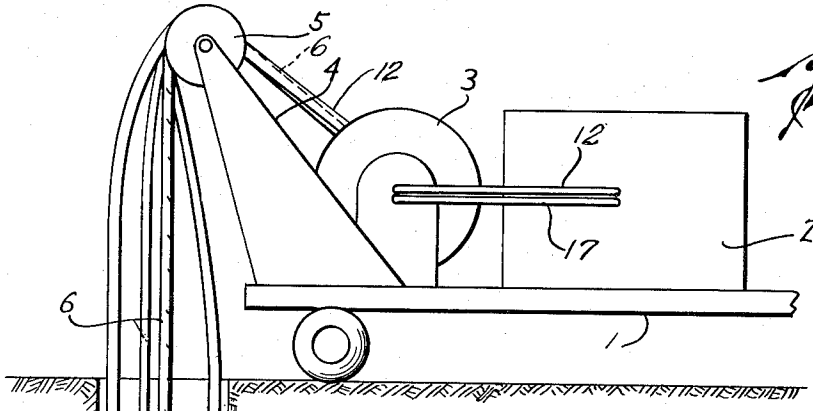


Fig. 1

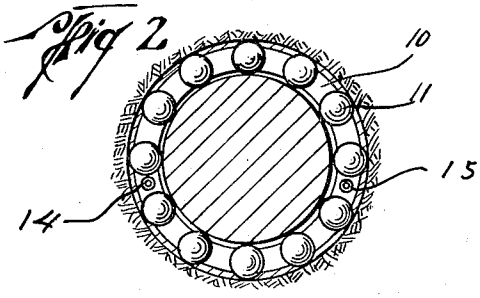


Fig. 2

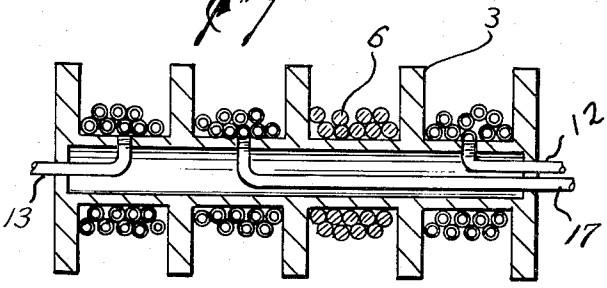
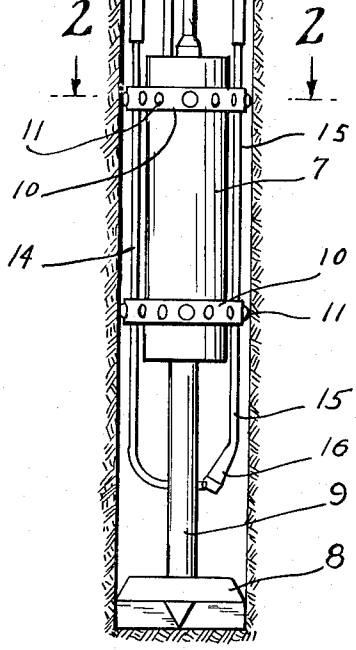


Fig. 3



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1 Claim. (Cl. 175—103)

This invention relates to new and useful improvements in a method of drilling wells and an apparatus for carrying out said method.

It is an object of this invention to provide a method of drilling wells whereby the customary derrick and rotary equipment is eliminated and the well bore is formed by means of a self-powered drilling unit.

It is another object of this invention to provide a drill bit operating means employing a jack hammer in well drilling operations.

It is still another object of the invention to provide a drilling means having novel means for removing the cuttings of the drill bit.

With the above and other objects in view, the invention has relation to certain novel features of construction, operation and arrangement of parts more particularly defined in the following specifications and illustrated in the accompanying drawings, wherein:

FIGURE 1 is a side elevational view of the device suspended in a well bore.

FIGURE 2 is a cross sectional end view taken on the line 2—2 of FIGURE 1, and

FIGURE 3 is a cross sectional front elevational view of the drum employed.

In the drawings the numeral 1 designates a vehicle, such as a flat bed truck, on which is mounted the necessary compressor 2 and rotatable drum 3. A boom 4 extends outwardly from the rear of the truck bed 1 and has a rotatable pulley 5 on the extended end thereof. A cable 6 extends from the drum 3 over the pulley 5 to the top of the jack hammer 7, and a drill bit 8 is mounted on the reciprocating shaft 9 of the jack hammer 7. Suitable aligning means, such as the ball bearing retainers 10 and ball bearings 11 may be mounted on the outside surface of the jack hammer 7 in any suitable manner as by tightly fitting the retainers on the hammer, or by welding same thereto, to bear against the bore as it is formed to maintain the jack hammer in vertical alignment.

A vacuum system consisting of the high pressure line 12 and low pressure line 13 extend downwardly from the drum 3 over the pulley 5 to the jack hammer 7 and connect with the conduits 14, 15, said conduits 14 and 15 being mounted on the jack hammer and extending through the retainers 10, 10 and terminating below the jack hammer housing adjacent the bit 8. The conduit 15 has an enlarged funnel shaped opening 16 to receive

the cuttings from the drill bit 8. An air line 17 supplies the jack hammer with the usual motivating power. The lines employed are of a material customarily employed in the trade that is of sufficient cross sectional rigidity that they will be wound on to the drum 3 without collapsing, thus maintaining flow connection therethrough at all times.

The drilling operations may be started in any suitable manner, as by placing a section of pipe over the jack hammer as a guide until a sufficient depth has been reached by the drill to receive the jack hammer in the bore, and drilling then proceeds by lowering the jack hammer into the formation by the cable 6 as the bore is formed.

The drill bit 8 may be of any desired design as to cutting edge, but will be of a greater circumference than the circumference of the jack hammer jacket so that the device may be readily withdrawn from the bore as desired.

While the foregoing is considered a preferred form of the invention, it is by way of illustration only, the broad principle of the invention being defined by the appended claim.

What I claim is:

In a drilling device, a cable, a drill bit and jack hammer, said drill bit and jack hammer being suspended into a well bore by said cable, annular bearings mounted on said jack hammer and vertically spaced apart maintaining said jack hammer in alignment with the well bore, air conduits mounted on said jack hammer and extending through said bearings, the lower terminals of said conduits being positioned adjacent each other, a high pressure conduit extending through said well bore and connected to the upper terminal of one of said air conduits and a low pressure conduit extending through said well bore and connected to the upper terminal of said other conduit, means for applying a high pressure of air flow to said high pressure conduit and a low pressure air flow to said low pressure conduit creating a suction at a point above and adjacent the drill bit and removing the cuttings from the bore.

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