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H. R. ALEXANDER

2,608,384

DRILL

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2 SHEETS—SHEET 1

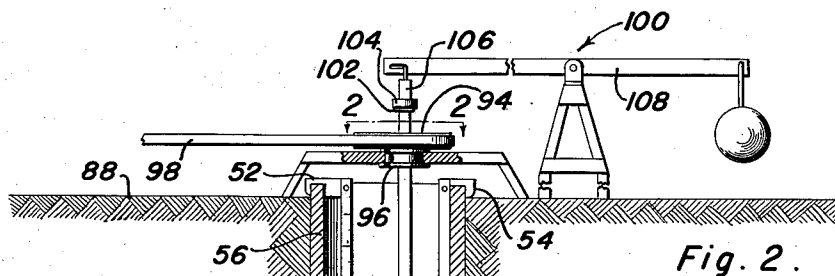


Fig. 1.

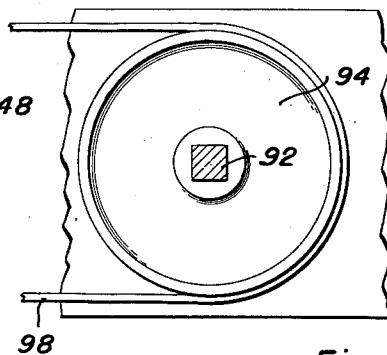


Fig. 2.

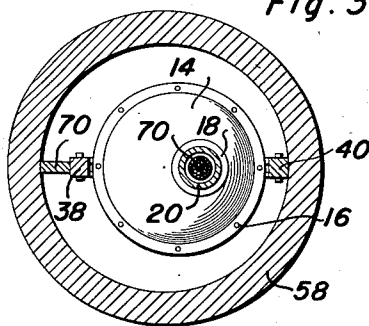


Fig. 3.

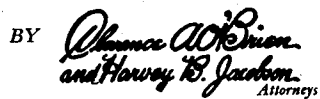
Henry R. Alexander
INVENTOR.

BY *Charles A. O'Brien*
and *Harvey B. Jackson*
Attorneys

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DRILL

2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

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DRILL

Henry R. Alexander, Springfield, Ill.

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4 Claims. (Cl. 255—1.6)

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This invention relates to new and useful improvements in drills and the primary object of the present invention is to provide a drilling apparatus including novel and improved means whereby the same is particularly applicable for lateral drilling in the sides of a drill hole.

Another important object of the present invention is to provide a lateral drilling apparatus including novel and improved means for suspending the apparatus a selected predetermined and scaled distance from the ground surface.

A further object of the present invention is to provide a drilling apparatus for boring lateral openings into the walls of a drill hole including a housing having an arcuate integral extension at one end that is formed with an opening through which a flexible bit holding shaft is extendable at right angles to the longitudinal axis of the drill hole.

A still further aim of the present invention is to provide a drilling apparatus that is simple and practical in construction, strong and reliable in use, small and compact in structure, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a vertical sectional view of a drill hole or well casing, showing the present drilling apparatus therein and in use;

Figure 2 is an enlarged transverse horizontal sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is an enlarged transverse horizontal sectional view taken substantially on the plane of section line 3—3 of Figure 1;

Figure 4 is an enlarged side elevational view of the inner casing, the housing driven shaft and flexible bit holding shaft in operative association, and with parts thereof broken away and shown in section;

Figure 5 is an enlarged, fragmentary longitudinal vertical sectional view taken substantially on the plane of section line 5—5 of Figure 4; and,

Figure 6 is an enlarged, fragmentary longitudinal vertical sectional view taken substantially on the plane of section line 6—6 of Figure 1.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present

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invention, the numeral 10 represents a housing open at its upper end and provided with an annular retaining flange 12 that removably engages a supporting plate 14 which is secured to the retaining flange 12 through the medium of a plurality of fasteners 16. This supporting plate 14 is provided with an internally threaded socket or opening 18 that receivably engages the lower externally threaded end of a lower pipe section 20.

Integrally formed with the housing 10, is an arcuate lower extension 22 having an opening 24 formed in its outer extremity 26. Fixed by bolts or the like 28 to the outer extremity 26 of the extension 22, is a holding ring 30 that forces a packing washer 32 against an annular shoulder 34 integrally formed with the inner surface of the extension 22 adjacent the opening 24.

Projecting outwardly from substantially diametrically opposite sides of the housing 10, is a pair of rigid ears 36 that pivotally engage the lower terminals 38 and 40 of a pair of hanger or suspension arms 42 and 44 each of which are preferably formed of a plurality of sections which are pivotally jointed as at 45. These arms include upper sections 46 and 48, one of which for example 46 is provided with graduations or a scale 50.

Holding or gripping members 52 and 54 pivotally carried by the upper sections 46 and 48 engage the upper open end 56 of an outer casing 58 that extends into the well opening or drill hole 60.

The upper externally threaded end of the lower pipe section 20 receivably engages the enlarged internally threaded end 62 of an upper or intermediate pipe section 64. A sealing and wear washer 66 is interposed between the upper end of the lower pipe section 20 and an annular shoulder 68 in the end 62 of the upper section 64.

The numeral 70 represents a flexible bit supporting shaft that extends downwardly through the lower pipe section 20, the housing 10, and outwardly through the opening 24 in the extension 22. The upper terminal 72 of the flexible shaft 70 extends into a socket member 74 having a crimped or tapered open end 76. A rivet or the like 78 extends through the socket member 74 and the upper terminal 72 of the flexible shaft 70. Integrally formed with the socket member 74, is a reduced, externally threaded stud 80 that receivably engages an internally threaded recess 82 provided in the lower end of a sectional driven shaft 84. It is noted that the driven shaft includes a group of sections each of which is formed with a socket or threaded recess 82 in their lower ends and reduced externally threaded upper end

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portions 86 whereby the sections when assembled will be of a desired length to extend above the ground surface 88. The uppermost of the driven shaft sections, which will be referred to by the numeral 90, is preferably square in cross section to engage a square central opening 92 in a driven pulley 94.

Fixed on the ground surface 88 above the well hole 60, is an elevated supporting table that rotatably supports a bearing or drum 96 which is suitably secured to the driven pulley 94. The driven pulley 94 is connected by an endless belt 98 to a suitable drive pulley (not shown) that is driven by a suitable motor (not shown).

In order to reduce the weight of the shaft 90 acting upon the bit carried by shaft 70, there is provided a braking and balancing mechanism 100 that is connected to the shaft 90 to support the same but in such a manner as to permit rotation of the latter, such as a bearing 102 carried by the shaft 90 engaging a bearing 104 mounted on a detachable shaft 106 carried by the pivot beam 108.

Obviously, other suitable means could be employed for supporting the weight or a considerable portion of the weight of the shaft 90, such as a cable attached to the top of shaft 90 and through swivels and pulleys to the drum with a known and conventional brake on the cable. By such an arrangement the shaft 90 may be raised and the speed rotation thereof controlled. Since the present invention does not attempt to claim such a conventional and known method, this latest apparatus is not shown.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A drill comprising a well casing extendable into a drill hole and having upper and lower edges, an arcuate housing suspended below the lower edge of said casing, said housing having upper and lower openings therein at right angles to each other, an elongated tubular member secured at one end in the upper opening of said housing, said tubular member being received in said casing, a driven shaft mounted for rotation in said tubular member, a flexible bit supporting shaft secured to said driven shaft, said flexible shaft being received in said housing and having a portion projecting outwardly through the lower

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opening in said housing, means for rotating said driven shaft, a pair of arms pivoted to and rising from said housing, and gripping members on said arms receiving the upper edge of said casing for supporting said housing and said tubular member relative to said casing.

2. The combination of claim 1 wherein said housing includes an arcuate tubular extension disposed at right angles to the tubular member and receiving said flexible shaft, and means carried by said extension and surrounding said flexible shaft tending to prevent the entrance of dirt into the housing through said extension.

3. The combination of claim 2 wherein said means carried by said extension includes an internal shoulder on said extension, a holding ring secured to said extension and spaced parallel to said shoulder, and a packing washer interposed between said shoulder and said holding ring.

4. A drill comprising a casing extendable into a drill hole and having upper and lower edges, a housing suspended below the lower edge of said casing, said housing having upper and lower openings therein at right angles to each other, an elongated tubular member secured at one end in the upper opening in said housing, said tubular member being received in said casing, a driven shaft mounted for rotation in said tubular member, a flexible bit supporting shaft secured to said driven shaft, said flexible shaft being received in said housing and having a portion projecting outwardly through the lower opening in said housing, means for rotating said driven shaft, a pair of ears projecting from diametrically opposite sides of said housing, a pair of hanger arms having lower ends pivoted to said ears, and gripping members at the upper ends of said arms receiving the upper edge of said casing for supporting said housing and said tubular member relative to said casing.

HENRY R. ALEXANDER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,312,565	Noftz et al.	Aug. 12, 1919
1,367,042	Granville	Feb. 1, 1921
1,530,764	Dick	Mar. 24, 1925
1,595,922	Prindle	Aug. 10, 1926
1,660,999	MacDonell	Feb. 28, 1928
1,779,581	Behnke	Oct. 28, 1930
1,804,819	Spencer, Jr. et al. ..	May 12, 1931
1,838,539	Doherty	Dec. 29, 1931
2,198,016	Rogers et al.	Apr. 23, 1940
2,247,188	Davis	June 24, 1941
2,251,916	Cross	Aug. 12, 1941
2,345,816	Hays	Apr. 4, 1944