July 16, 1935.

L. E. THOMAS

2,008,523

WELL DRILLING TOOL

Filed July 17, 1934

Fig. 1.

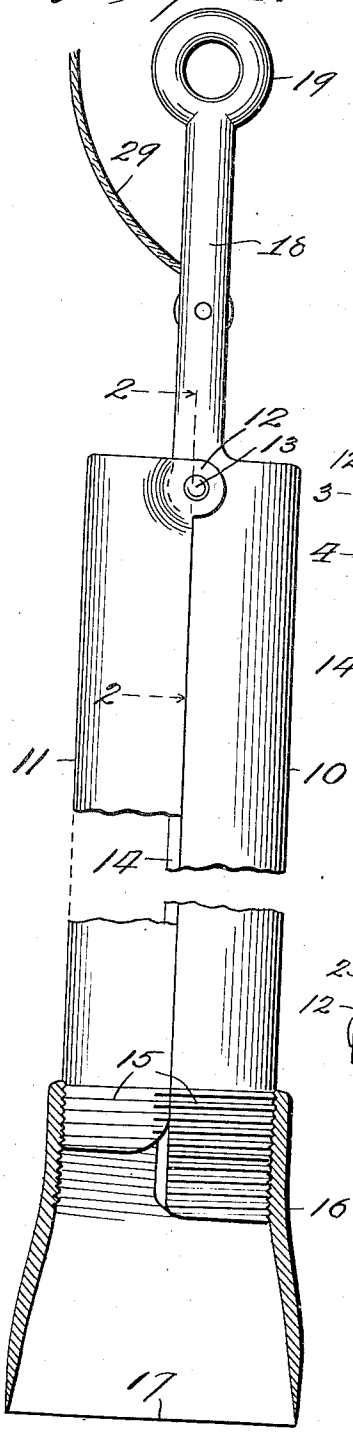


Fig. 2.

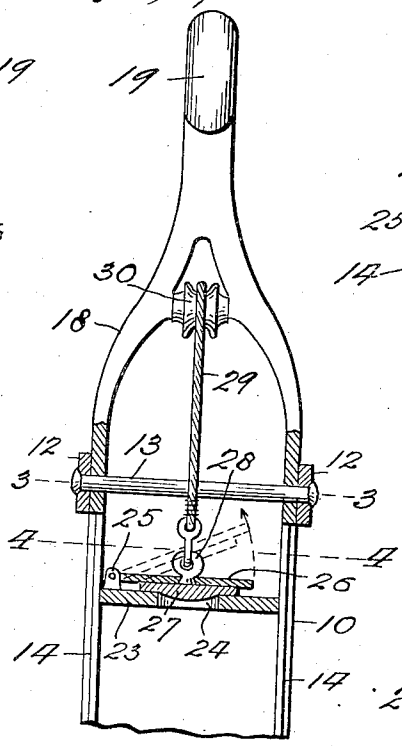


Fig. 4.

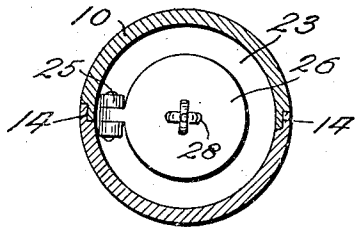


Fig. 5.

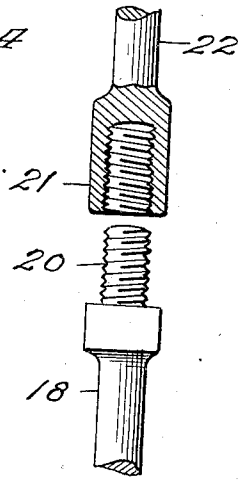
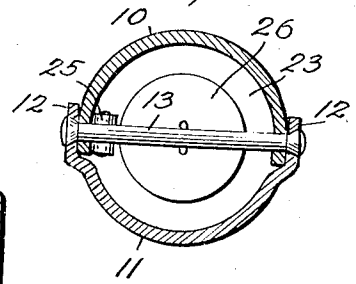


Fig. 3.



INVENTOR,
LOGAN E. THOMAS.
BY Martin P. Smith ATTY.

Patented July 16, 1935 2,008,523

UNITED STATES PATENT OFFICE

2,008,523

WELL DRILLING TOOL

Logan E. Thomas, Los Angeles, Calif.

Application July 17, 1934, Serial No. 735,546

7 Claims. (Cl. 255—1)

My invention relates to a well drilling tool and has for its principal objects, to generally improve upon and simplify the construction of the existing forms of well drilling tools and to provide a relatively simple, practical and inexpensive tool that may be utilized for the comparatively rapid drilling of well holes and which tool may also be conveniently employed as an underreamer, a baler, a core socket and for cleaning paraffine and other accumulations from the inner surfaces of well tubes.

With the foregoing and other objects in view my invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a side elevational view of a well drilling tool constructed in accordance with my invention, with parts broken away and in section.

Fig. 2 is a vertical cross section taken on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2.

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2.

Fig. 5 is an elevational view partly in section, of a coupling between the upper end of the tool and a drill rod.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of my invention, 10 and 11 designate the body members of the drill, which body members are formed of channellike sections of metal half round in cross section so that when the two members are arranged with their edges in contact, the body is in the form of a tube defined along a medial longitudinal plane.

This tubular body may be of any desired length, for instance, where the body is constructed to drill a six inch hole, its length should be from five to seven feet.

The upper inner corners of member 11 are provided with ears 12, which overlie the upper inner corners of member 10 and passed through these ears and through member 10, is a rivet or hinge pin 13, which enables member 11 to be swung outwardly away from member 10.

The vertical edges of members 10 and 11 are rabbeted as designated by 14 in order to provide overlapping portions of the body members at the longitudinal joints between same.

The lower end of member 11 terminates a short distance above the lower end of member 10 and the external faces of the lower portions of said members are threaded as designated by 15, in order to be engaged by the internal thread that is formed on the upper portion of a short cylindrical bit or cutting tool 16.

The lower portion of this bit is flared outwardly so that the diameter of its lower portion is an inch or two greater than the diameter of the tool body formed by members 10 and 11 and the lower edge of this bit is sharpened as designated by 17.

Formed integral with the upper inner corners of body member 10, are the lower ends of the legs of a wishbone shaped yoke 18 and where the tool is constructed for hand drilling operations, the upper end of this yoke terminates in a ring 19 for the attachment of a cable.

Where the tool is constructed for power drilling, the upper end of the yoke is provided with a threaded stud 20, as illustrated in Fig. 5 and which threaded stud is engaged by a threaded socket 21 that is formed on the lower end of a drill rod 22.

Rigidly fixed within the upper portion of body member 10, is a disc 23 in the center of which is formed an opening 24. The edge of this disc that projects beyond body member 10, fits snugly within body member 11 and directly engages the curved inner surface of said member 11.

Connected by a hinge 25 to disc 23, at a point adjacent to the edge thereof, is a plate 26 to the underside of which is secured a disc 27 of leather, rubber or analogous material and which last mentioned disc normally occupies a position on the upper surface of disc 23 and closes the opening 24 therein.

Secured to the center of disc 26, is an eye 28, to which is suitably connected one end of a pole cord 29. This cord extends upwardly over a pulley 30 that is journaled in the upper portion of yoke 18.

Where my improved tool is used for drilling a well hole, the tool is reciprocated vertically by hand or engine power and on each down stroke, the sharp lower edge 17 of the bit, will cut into the earth formation and that portion of the earth encompassed by the bit, will pass upward into the lower portion of the tubular body of the tool comprising the parts 10 and 11.

As the reciprocating action continues, the cuttings from the bit will pass upward, thereby filling the body of the tool and the air above the body of cuttings within the tool will act automatically to open valve that closes the opening 24, thereby permitting the trapped air to escape.

When the chamber within the body of the tool is filled or nearly filled with cuttings, which ac-

tion may be readily noted by the operator, who observes the amount of cable or drill rod that is lowered into the well, the tool is lifted from the well.

To effect a discharge of cuttings from the tool, the bit **16** is unscrewed until its upper end is positioned below the lower end of body member **11** and said body member may now be swung outward away from body member **10** so as to enable the contents of the tool to readily discharge.

My improved tool functions as a cord socket by observing the nature of the cuttings that accumulate within the body of the tool after the same has been drawn to the surface of the ground and opened as just described.

When the tool is used as a baler, it is lowered into the well and filled with mud or slush and the latter will be held within the tool as the same is drawn upwardly to the surface of the well, by the vacuum produced within the chamber of the tool above the body of mud or slush and the partition **23**, the opening in which is closed by the valve comprising the parts **26** and **27**.

When the tool has been drawn to the surface of the ground, it is swung into position above the mud or slush tank and the valve is opened by pull imparted to cord **29**, thereby permitting the contents of the tool to discharge.

For underreaming operations, the tool is lowered through the casing and reciprocated just below the lower end of said casing and the enlarged lower portion of the bit **16** cuts a hole in the ground of sufficient size to permit the casing to be gradually lowered in the hole.

For cleaning paraffine and like accumulations from the inner surface of a well tube, the tool is gradually lowered into the well and at the same time reciprocated and the sharp lower edge of the bit will cut and remove the paraffine or other accumulations and the same may be picked up from the lower end of the well by the tool and drawn to the surface.

Where the drill is being used in dry formation that will readily pack into the tubular body of the drill, the valve that closes opening **24**, may be removed if desired.

Thus it will be seen that I have provided a well drilling tool that is relatively simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

The tool may be advantageously employed in either wet or dry drilling and the one tool without change or adjustment may be conveniently employed as a drill, an underreamer, a baler, a cord socket and for cleaning accumulations from the inner surfaces of well tubes.

It will be understood that minor changes in the size, form and constructions of the various parts of my improved well drilling tool may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. A well drilling tool, comprising a pair of elongated half round members hinged to each other adjacent their upper ends, the lower portions of which members are externally threaded and a cutting bit screw seated on the threaded lower portions of said members.

2. A well drilling tool, comprising a pair of elongated channel-shape members hinged to each other adjacent their upper ends, the lower end of one of said members extending a short distance below the lower end of the other member, the lower ends of both members being externally threaded and a cutting member screw-seated on the threaded lower ends of said members.

3. A well drilling tool, comprising a pair of elongated channel-shaped members hinged to each other adjacent their upper ends, the joints between the engaging edges of said edges having overlapping portions and a cutting bit removably seated on the lower ends of said members.

4. A well drilling tool, comprising a pair of elongated channel-shaped members hinged to each other adjacent their upper ends, a cutting bit removably mounted on the lower ends of said members, a disc secured to one of said members adjacent the hinge between said members, said disc having an opening and an upwardly opening valve normally closing the opening in said disc.

5. A well drilling tool, comprising a pair of elongated channel-shaped members hinged to each other adjacent their upper ends, a cutting bit removably mounted on the lower ends of said members, a disc secured to one of said members adjacent the hinge between said members, said disc having an opening, an upwardly opening valve normally closing the opening in said disc, a yoke projecting from the upper end of the member in which the disc is seated, a pulley journaled in said yoke and a pull cord secured to said valve and passing over said pulley.

6. A well drilling tool, comprising a pair of elongated half round channel-shaped members arranged to form an elongated tubular member with the longitudinal edges of said half round members bearing against one another, a yoke projecting upwardly from the upper corners of one of said members the upper corners of the other member being hinged to the corners of the first mentioned member adjacent the lower ends of the legs of said yoke and a cutting bit removably mounted on the lower ends of said members.

7. A well drilling tool, comprising a pair of elongated half round members hinged to each other adjacent their upper ends, a yoke projecting upwardly from the upper portion of one of said members, a cutting bit removably mounted on the lower ends of said members and an upwardly opening check valve arranged in the upper portion of the chamber between said members.

LOGAN E. THOMAS.