April 29, 1924. 1,492,320

C. M. COPELAND

DEVICE FOR MEASURING DEPTH OF WELLS

Filed July 27, 1922

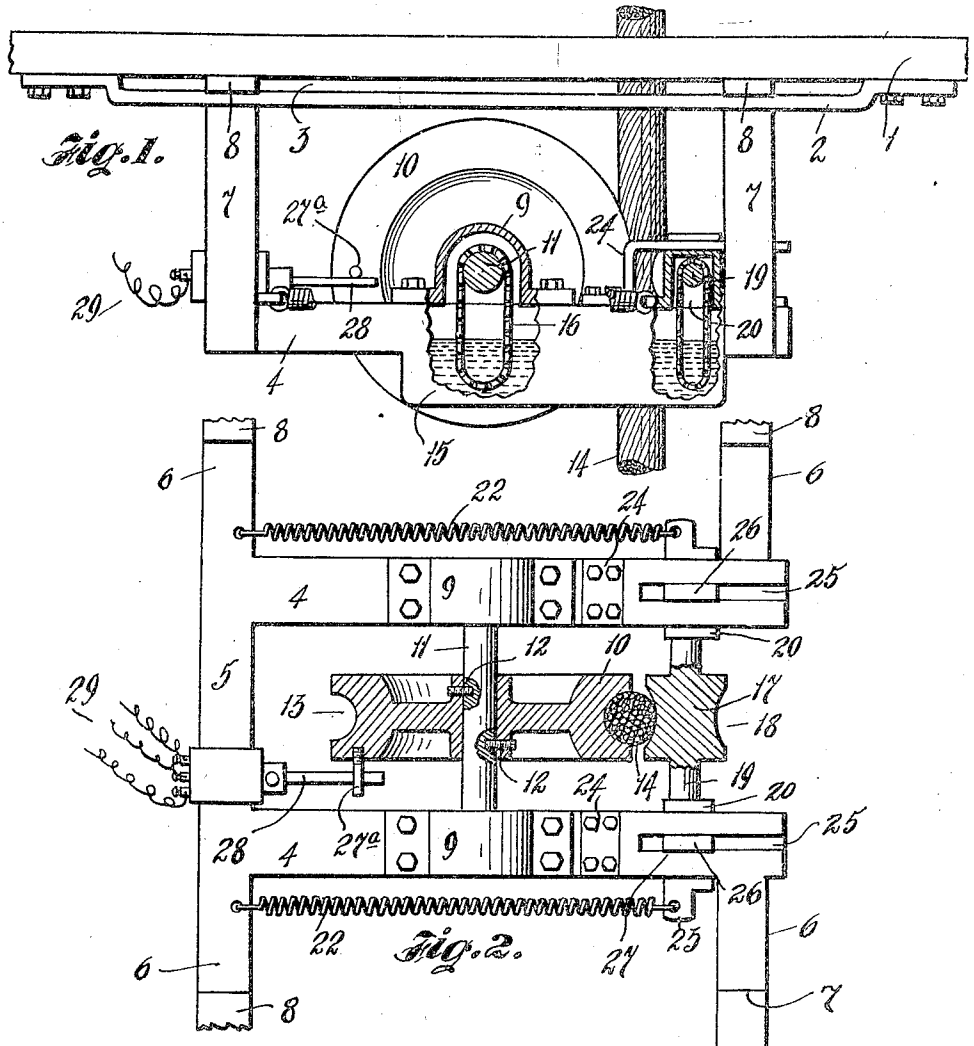


Fig. 1.

Fig. 2.

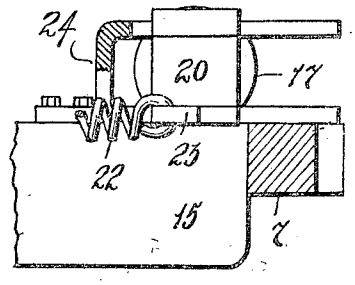


Fig. 3.

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Patented Apr. 29, 1924. 1,492,320

UNITED STATES PATENT OFFICE.

CLINT M. COPELAND, OF GRAHAM, TEXAS.

DEVICE FOR MEASURING DEPTH OF WELLS.

Application filed July 27, 1922. Serial No. 577,958

To all whom it may concern:

Be it known that I, CLINT M. COPELAND, a citizen of the United States, residing at Graham, in the county of Young and State of Texas, have invented certain new and useful Improvements in Devices for Measuring Depth of Wells, of which the following is a specification.

This invention relates to means for measuring the depth of wells in well drilling, especially oil wells, and it pertains more particularly to the novel arrangement of the parts thereof.

The object of the invention, specifically, is to provide a device of this nature for measuring the length of the well cable upon which the tools are suspended, as it is drawn from the well to ascertain the depth of the drilled hole, and also to ascertain the position of the tools when desirable. The device is also capable of operation in either the upward or downward movement of the well cable.

The present invention is adapted to be used in connection with a meter arrangement for registering the depth of the well, the latter device forming the subject matter of a co-pending application filed May 31, 1921, Serial No. 473,709.

The invention will be clearly understood by reference to the following description, taken in connection with the accompanying drawings, forming part hereof in which—

Figure 1 is a side elevational view of the device in its frame at the top of a well derrick, showing its connection to the well cable, with parts broken away.

Figure 2 is a top or plan view, partly in horizontal section; and

Figure 3 is a detail sectional view of one end of the roller shaft and its spring connection.

Referring more closely and in detail to the drawings, 1 denotes the top of a derrick frame to which the device is suspended. Underneath each side of the derrick top parts 1—1 is a bar 2 which forms a longitudinal recess 3. The device has a frame composed of two parallel bars 4—4 and an integral connecting piece 5, also four integrally formed lateral arms 6—6. The arms 6—6 are bent at right angles to the frame and then directed upwardly at 7—7 and then outwardly at 8—8 and passed through the recess 3 and form a means for suspending the frame and for sliding it to and fro for adjustments.

Upon the bars 4—4 of the frame are bearings 9—9 which support a shaft carrying a pulley wheel 10, the pulley wheel being affixed to the shaft 11 by screws 12—12 and provided with a groove 13 to receive a cable 14.

Underneath each end of the shaft 11 is a trough 15 containing lubricating oil and by means of the chains 16 on each end of the shaft 11 it is kept lubricated.

Adjacent one side of the pulley 10 is a roller 17 with a groove 18, the roller having a shaft 19 which rotates in bearings 20—20. A chain 21 on each end of the shaft 19 is suspended in the trough 15 and also provides lubrication for the shaft 19 of the roller.

The shaft 19 and pulley 17 are held against the cable 14 so that the cable will at all times be in engagement with the pulley and roller. For this purpose there are provided springs 22—22, one end of each being fastened to connecting piece 5 of the frame and then connected to an extended portion 23 of the bearing 20. Two angular arms 24—24 are bolted to the bars 4—4 of the frame and are provided with a longitudinal slideway 25 for the reception of upwardly extended guide-bars 26—26, also formed integrally with the bearing 20. The guide-bars have a slight engaging flange as shown in the drawings at 27 for the purpose of more effectually enabling the bars to ride in a true line.

Referring to Figure 1, the wheel or pulley 10 is provided with a pin 27^a which, as the wheel rotates, engages a resilient contact bar 28. This bar forms a means for making and breaking connection in an electric circuit to register with each revolution of the wheel a number on a meter (referred to above) connected through a battery by wires 29—29.

As the cable descends into the well, the rotation of wheel 10 through pin 27^a will connect and disconnect the electric circuit and register a number on the meter. The roller 17 will keep the cable in contact with the pulley to ensure constant rotation of the wheel when the cable is ascending or descending, while the guide-bars 26—26 in the

slideways 25—25, together with the springs 22—22 provide for any irregularities in the cable or for different cable sizes.

What is claimed is—

1. In a measuring device, a derrick frame having a top, a pair of spaced parallel bars secured at their ends to and beneath the top of the frame and having their intermediate portions spaced from the frame top, a second frame including a pair of parallel side bars, a pair of lateral arms carried by said bars of the second frame having their ends extending vertically and finally outwardly and engaged in the spaces between the top of the derrick frame and the intermediate portions of the first named bars, a cable engaging wheel carried by the bars of the second frame, a pair of angular arms secured to the bars of the second frame and having slideways, a shaft carrying a cable engaging roller disposed opposite to the wheel, bearings for said shaft having upwardly projecting guides engaged in said slideways, springs connected to the bearings and to the second frame to hold said roller against the cable, a projection on the wheel, and a resilient member on the second frame for engagement with said projection of the wheel to actuate a meter.

2. In a measuring device, a frame having a top, bars secured to and beneath the top and having portions spaced from the top, a second frame having parts extending thereabove and engaged in the space between the top and the first named bars to suspend the second frame from the top of the derrick frame, a shaft journaled on the second frame and having a cable engaging wheel, a pair of angular arms carried by the second frame and having slideways, a second shaft having a cable engaging roller, bearings for the second shaft disposed between the second frame and the slideways and having upwardly projecting guides engaged in the slideways, springs connected to the bearings and to the second frame to hold the roller against the cable, a projection on the wheel, and means engaging the projection to actuate a meter.

3. In combination with a frame, slideways parallel to the frame and disposed thereabove, a cable engaging wheel carried by the frame, bearings mounted between the slideways and frame and having parts extending upwardly therefrom and engaged through the slideways, a shaft having a cable engaging roller journaled in the bearings, springs connected to the bearings and to the frame, and meter actuating means operated by the wheel.

In testimony whereof I have signed my name to this specification.

CLINT M. COPELAND.