Oct. 9, 1934. W. H. BLACKMON 1,976,277

TORQUE INDICATOR

Filed July 10, 1933 2 Sheets-Sheet 1

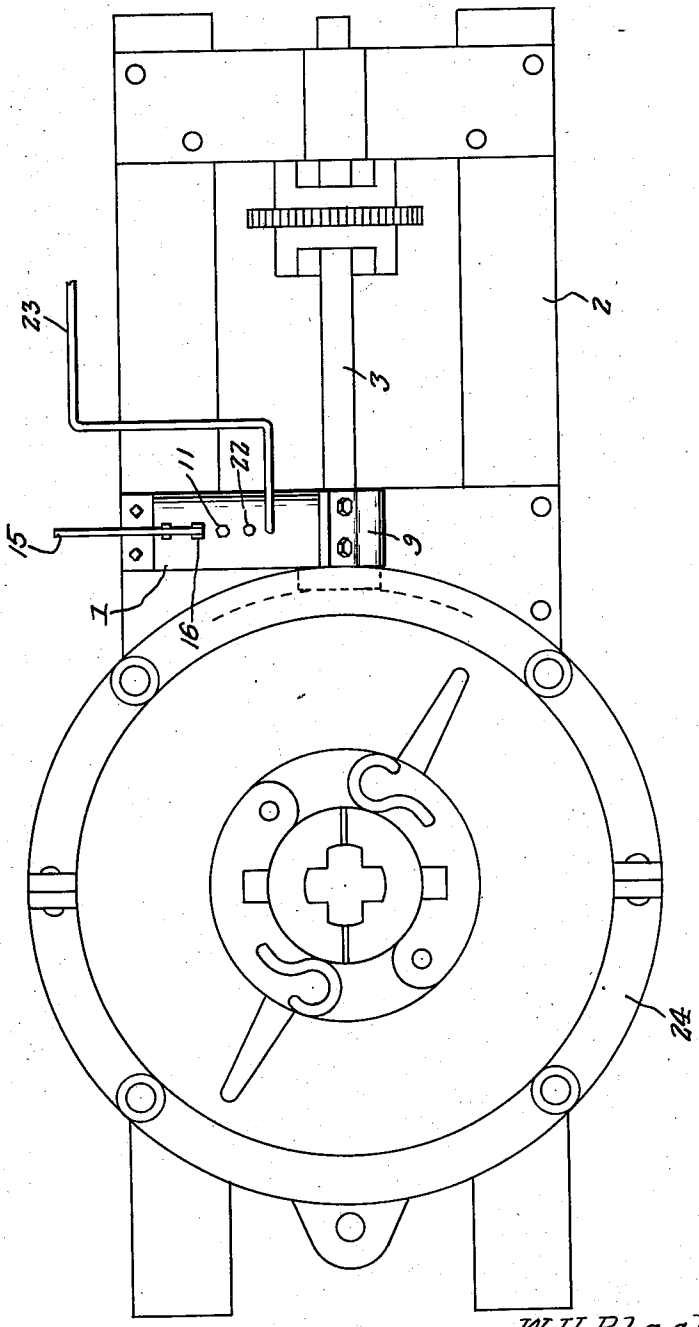


Fig. 1.

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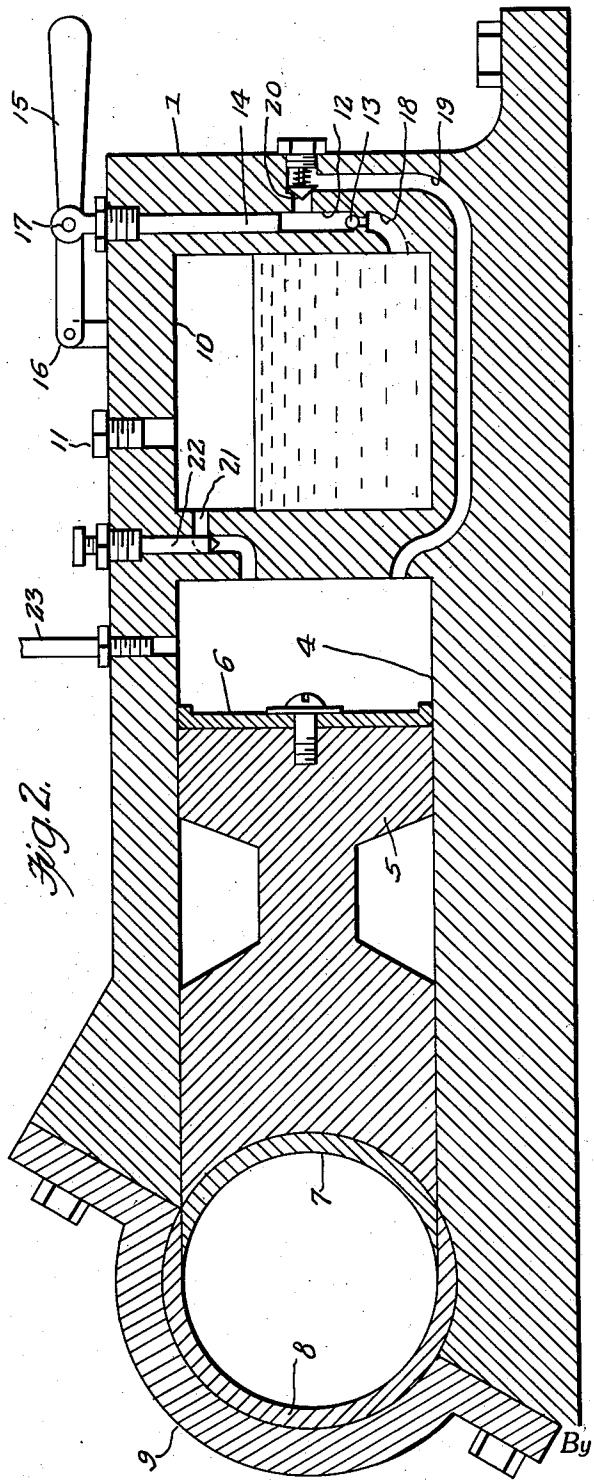


Fig. 2.

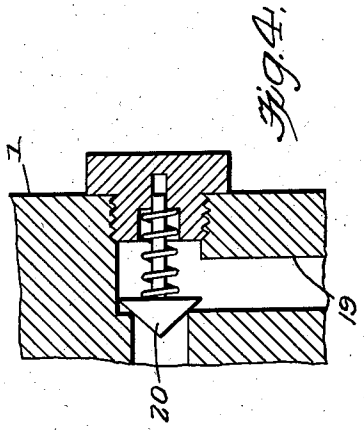


Fig. 4.

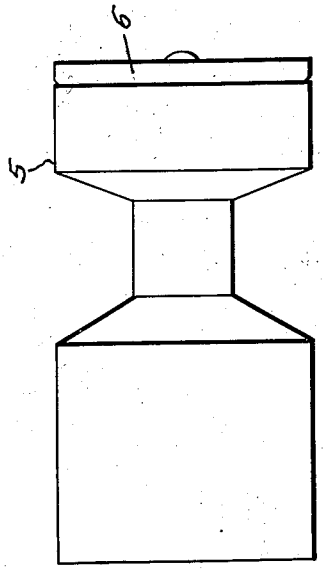


Fig. 3.

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Patented Oct. 9, 1934 1,976,277

UNITED STATES PATENT OFFICE

1,976,277

TORQUE INDICATOR

William Henry Blackmon, Tampico, Mexico

Application July 10, 1933, Serial No. 679,821

2 Claims. (Cl. 265—25)

This invention relates to new and useful improvements in torque indicators for use particularly in well drilling and has for its primary object to provide, in a manner as hereinafter set forth, a device of this character embodying a novel construction, combination and arrangement of parts, through the medium of which the twisting stress to which a drill pipe is subjected while operating will be shown, thus materially assisting the operator in preventing said drill pipe from being twisted off.

Other objects of the invention are to provide a torque indicator of the aforementioned character which will be simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in top plan, showing a torque indicator constructed in accordance with the present invention mounted in position for use.

Figure 2 is a view in vertical longitudinal section through the indicator.

Figure 3 is a detail view in side elevation of the piston.

Figure 4 is a detail view in vertical section through the check valve which controls the oil passage between the hand pump and the cylinder.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a body or casting 1 which is secured transversely on the base 2 of the drilling apparatus at right angles to the table drive shaft 3. One end of the casting 1 is immediately adjacent the drive shaft 3 and is inclined, as clearly illustrated in Figure 2 of the drawings. Extending into the casting 1 from the inclined inner end thereof is an oil receiving cylinder 4 in which a piston 5 is operable. Mounted on the inner end of the piston 5 is a suitable cup 6 which, of course, is to prevent leakage past said piston.

Mounted on the other end of the piston 5 is a bearing section 7 which is complemental to a bearing section 8 in a removable cap 9 which is mounted on the inclined end of the casting 1. The drive shaft 3 is journaled in the bearings 7 and 8.

The casting 1 also has formed therein, between the cylinder 4 and the outer end of said casting, an oil reservoir 10 which is filled through the medium of a removable plug 11. Formed in the casting 1, adjacent the reservoir 10, is a pump chamber 12 having a check valve 13 in its lower end. A plunger 14 reciprocates in the chamber 12, said plunger being actuated by a hand lever 15 which is pivotally mounted on top of the casting 1, as at 16. The lever 15 is provided with a slot through which the pin 17 of the plunger 14 passes. Oil from the reservoir 10 is drawn into the chamber 12 past the valve 13 through a passage 18 from said chamber. A passage 19 establishes communication between the chamber 12 and the cylinder 4, said passage 19 having mounted therein a spring seated check valve 20. It will thus be seen that the desired quantity of oil may be forced under pressure into the cylinder 4 from the reservoir 10. The oil may be permitted to return to the reservoir 10 from the cylinder 4 through a passage 21 which is controlled by a hand valve 22.

Communicating with the cylinder 4 for receiving oil under pressure therefrom is a tube 23. The tube 23 is connected with a pressure indicating gage (not shown) which may be located at any suitable point.

Briefly, the operation of the device is as follows: As the drive shaft 3 rotates the table 24 of the drilling apparatus in a clockwise direction, as usual, said drive shaft 3 exerts lateral pressure on the piston 5. The piston 5 is thus moved inwardly in the cylinder 4 in a manner to eject the oil from said cylinder into the tube 23 which, of course, actuates the gage. It will thus be seen that the stress on the drill pipe may be conveniently ascertained at any time. As previously stated, the quantity of oil in the cylinder 4 may be regulated as desired through the medium of the pump 14 and the valve 22. It may be well to here invite attention to the fact that the indicator constituting the present invention is operatively coupled to the drive shaft 3 immediately adjacent the table 24 of the drilling apparatus.

It is believed that the many advantages of a torque indicator constructed in accordance with the present invention will be readily understood, and although the preferred embodiment of the invention is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. Means for indicating lateral movement of a rotary shaft comprising a casting, a cylinder in the casting, said cylinder for the reception of a fluid, a fluid actuating piston slidably mounted in the cylinder, complemental bearings on the piston and on one end of the casting for embracing engagement with the shaft, and means for connecting a fluid pressure responsive gage with the cylinder.

2. Means for indicating lateral movement of a rotary shaft comprising a casting, a cylinder in the casting for the reception of a fluid, said cylinder communicating with one end of the casting, a bearing cap mounted on said one end of the casting, a bearing section in the cap, a fluid actuating piston slidable in the cylinder, a bearing section on one end of the piston, said bearing sections being in embracing engagement with the shaft, and means for connecting a fluid pressure responsive gage with the cylinder.

WILLIAM HENRY BLACKMON.