

Aug. 9, 1938.

W. R. GUIBERSON ET AL

2,126,007

DRILLING HEAD

Filed April 12, 1937

3 Sheets-Sheet 1

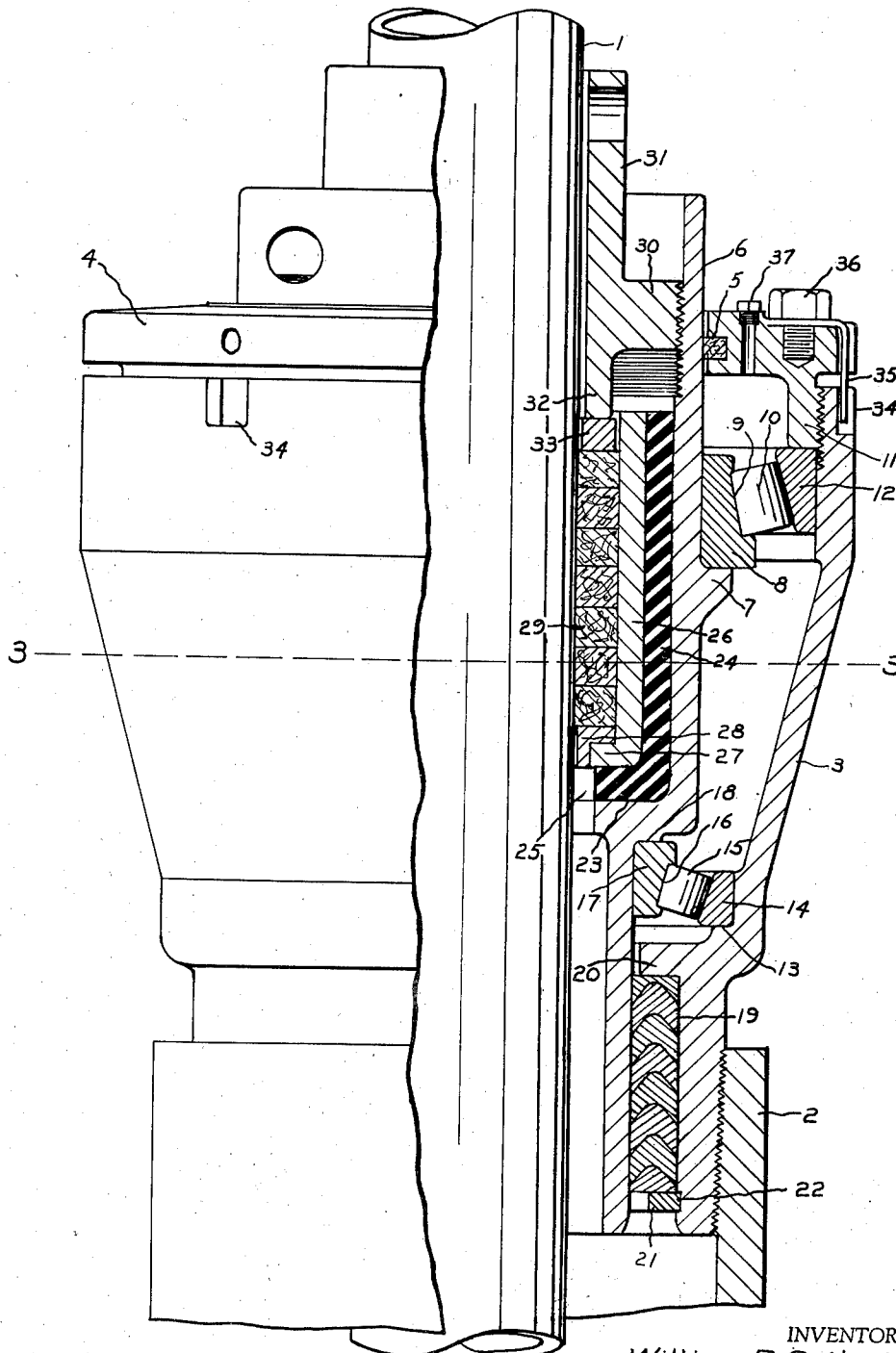


FIG. 1

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3 Sheets-Sheet 2

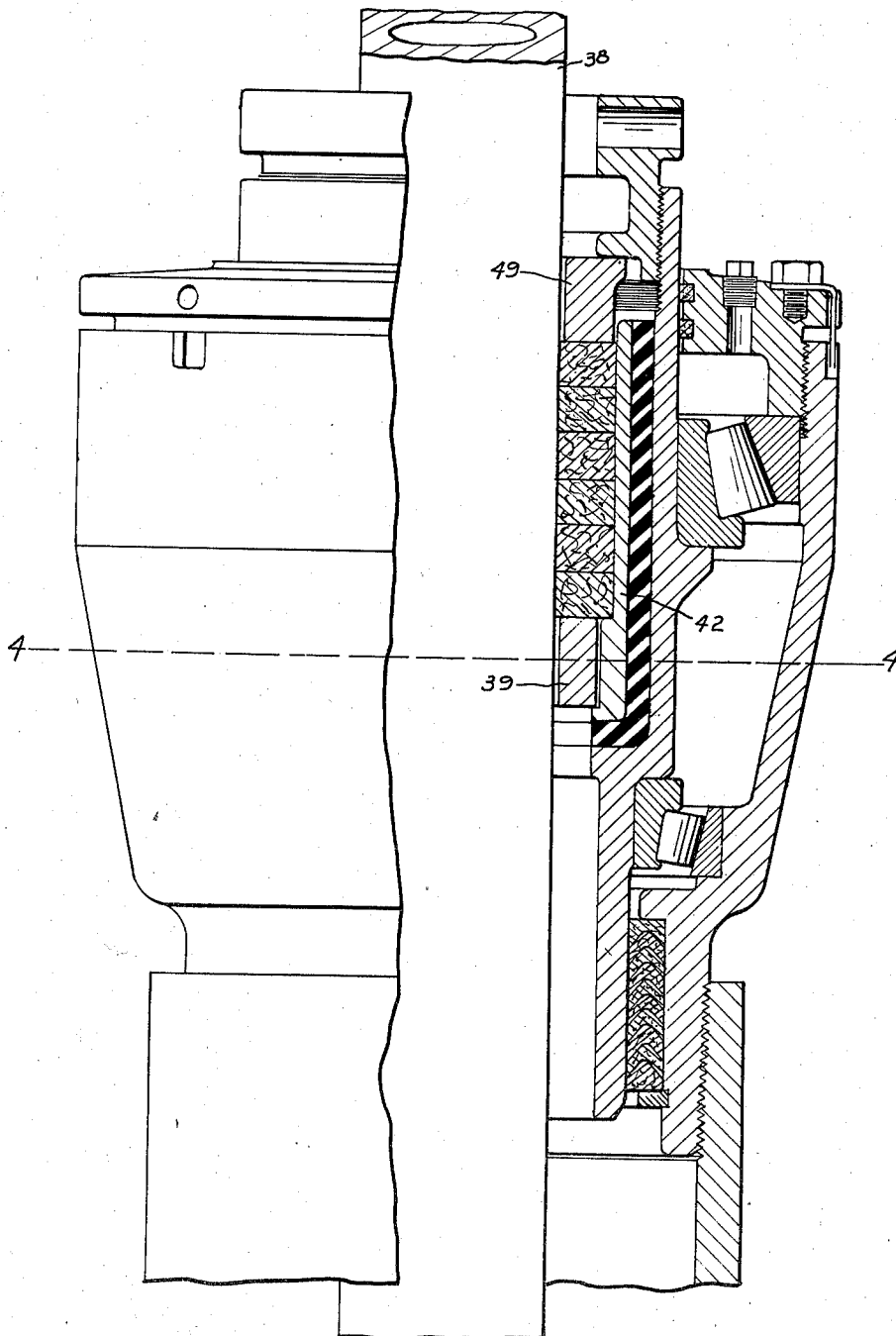


FIG. 2

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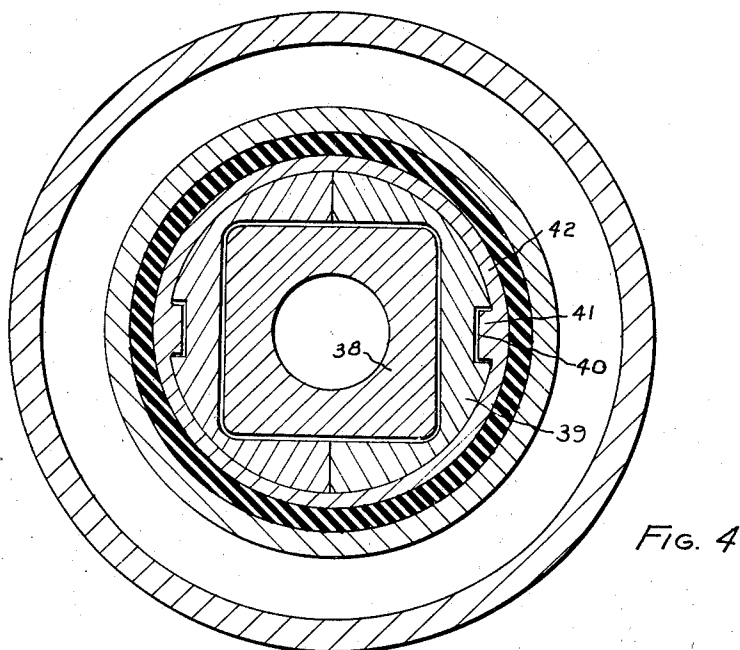
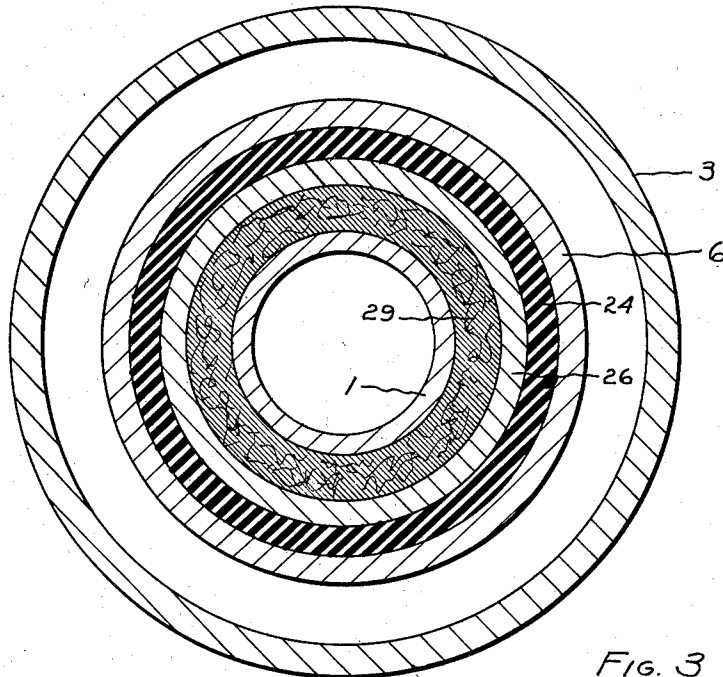
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3 Sheets-Sheet 3



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2,126,007

DRILLING HEAD

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8 Claims. (Cl. 255—1)

The object of this invention is to provide in a drilling head a shock absorbing medium which will also take care of slight malalignments of the kelly, and to provide a drilling head provided with bearings mounted in a dust-proof chamber, which acts as an oil reservoir. Another object of the invention is to provide for the adjusting of the said bearings. Another object of the invention is to provide a simple mechanism which may be easily manufactured, readily adjusted, easily assembled, and which may be quickly and easily repaired if replacement of parts should at any time be necessary. These and other objects will appear in the detailed specification and claims, which follow.

We have shown, by way of illustration, but not by way of limitation, our improved drilling head in the following drawings in which:

Fig. 1 is a side elevational view, partly in cross section, of our drilling head constructed for a round kelly.

Fig. 2 is a similar view showing the invention as applied to a square kelly.

Fig. 3 is a plan cross sectional view on the line 3—3 of Fig. 1, and

Fig. 4 is a plan cross sectional view on the line 4—4 of Fig. 2.

In the form of the invention, as illustrated in Fig. 1, a round kelly 1 is passed downwardly into the well casing 2, which is, of course, cemented in position and is therefore rigid. Attached to the upper end of the casing is a housing 3, which is screw threaded to the casing and, of course, is rigid therewith. The housing 3 is provided, near its upper end, with screw threads, to which is secured a cap 4, which carries a sealing ring 5, of felt or other suitable material, which bears against a sleeve 6. The sleeve 6 is provided with a flange 7 on which rests an inner race member 8 provided with a seat 9, which receives a series of rollers 10, the member 8 holding the rollers in position. The cap 4 is provided with a downwardly extending circular flange 11, and an outer race member 12 is seated immediately beneath the flange 11 and engages the inner wall of the housing 3.

The housing 3 is also provided with a shoulder 13, in which rests an outer race member 14, which acts as a track for a series of rollers 15, which are received within a seat 16 of an inner race member 17, which engages the outer wall of the sleeve 6, and a shoulder 18 thereon.

Interposed between the lower end of the housing 3 and the lower end of the sleeve 6 is a packing 19, which at its upper end engages a shoulder

20 forming a part of the housing 3, and at its lower end is held in position by a snap ring 21, which is received within a groove 22 in the housing.

The sleeve 6 is provided with an inwardly extending shoulder 23, and a cup-shaped resilient member 24 is vulcanized to said sleeve 6 and shoulder 23. The member 24 has a circular opening 25 in its bottom, which substantially conforms to the shapes of the inner periphery of the shoulder 23, and through which the kelly extends. The cup-shaped resilient member 24 is preferably made of rubber, which is vulcanized to a cylindrical sleeve 26, which has an inwardly extending flange 27 at its lower end. If desired, the member 24 may be vulcanized to either of the sleeves and moulded to the other sleeve.

Resting on the flange 27 is a ring 28, substantially L-shaped in cross section, and on this ring is a plurality of packing members 29. The sleeve 6 is interiorly threaded near its top, which threads are engaged by the threads on a circular flange 30, carried by sleeve 31. The sleeve 31 is provided with a downwardly extending cylindrical portion 32, which engages a ring 33, which presses downwardly against the packing members 29.

The top of the housing 3 is provided with a plurality of notches 34, in any one of which a locking bar 35 may be positioned and held in position by means of a bolt 36.

In operation the packing members 29 which tightly engage the kelly 1 and which rotate therewith, which motion is in turn imparted to all of the members intervening between the kelly and the rollers 10 and 15, while the housing 3 remains stationary. If there were any tendency of the kelly to vibrate, the resilient member 24 would absorb the said vibration and would not impart the same to the housing 3 and would therefore avoid the usual injurious results. Particular attention is called to the fact that the resilient member 24 is secured to the sleeves 26 and 6, so that all of the said members will turn as a unit.

Extending through the cap 4 is an oil duct 37, through which oil may be inserted so as to fill the reservoir between the housing 3 and sleeve 6. The rollers will therefore always rotate in oil, so that there will be very little wear of these parts. Attention is also called to the fact that this oil reservoir is completely shielded from dust, water, or other injurious substances.

If the bearings for the rollers need adjusting at any time, this may be quickly accomplished by removing the bolt 36 and the locking bar 35, and

thereafter rotating the cap 4 so as to screw it downwardly if we desire to tighten the bearings, or the reverse if we wish to loosen them.

If the cap is screwed downwardly, it will move the outer race member 12 downwardly, and this movement, if continued, would through the rollers 10 and race 8 move the sleeve 6 downwardly, thereby pushing the lower inner race member 17 into tighter engagement with the rollers 15. Both of the groups of rollers are therefore adjusted by manipulating the cap 4.

The construction shown in Figs. 2 and 4 is almost identical with that heretofore described, except that provision must be made for a square kelly 38, instead of a round one. The bearing rings 39 and 49 would be substantially square on the inside and round on the outside, and split in order to place the same on the kelly. Of course, if the kelly were triangular or of any other polygonal shape, the inner portion of the bearing ring would be of the same shape as the kelly. We have provided a notch 40 in the bearing ring 39 to receive a tongue 41, carried by the sleeve 42, which corresponds to the sleeve 26 shown in Fig. 1. The only difference therefore between the constructions shown in Figs. 1 and 2 is that in Fig. 1 the packing is adapted for a round kelly, and in Fig. 2 it is adapted for a polygonal kelly.

It might also be mentioned that in Fig. 1, the only reason why the parts intervening between the kelly and the rollers turn is because of the tight engagement between the packing 29 and the kelly, but in Figs. 2 and 4 we do not rely simply upon this tight engagement, for this turning movement is also induced by means of the notches 40 and tongues 41.

We realize that many changes may be made in the specification form of this invention which has been shown by way of illustration in this application without departing from the spirit of the invention, and we therefore desire to claim the same broadly, except as we may limit ourselves in the annexed claims. Having now described our invention, we claim:

1. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a packing engaging the kelly, a sleeve engaging and rotatable with the packing, an outer sleeve, and shock absorbing means vulcanized to one of said sleeves and interposed between the sleeves, and said sleeves being rotatable within the housing.

2. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of sleeves rotatable with the kelly, and cushioning means interposed between the said sleeves.

3. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of sleeves rotatable with the kelly, cushioning means interposed between the said sleeves, and bearings interposed between the outer sleeve and the housing.

4. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of concentric sleeves rotatable with the kelly, and a resilient member vulcanized to one of the sleeves and contacting the other sleeve.

5. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of concentric sleeves rotatable with the kelly, a resilient member vulcanized to one of the sleeves and contacting the other sleeve, and a plurality of adjustable bearings interposed between the outer sleeve and the housing.

6. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of spaced concentric sleeves rotatable with the kelly, a resilient member separating said sleeves, the space between the outer sleeve and housing forming an oil reservoir, a plurality of groups of bearings between the outer sleeve and housing, and means whereby both of said groups of bearings may be simultaneously adjusted.

7. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a plurality of concentric sleeves rotatable with the kelly, and a resilient member vulcanized to both of said sleeves.

8. In combination with a rotatable kelly and a fixed casing, a housing secured to the casing, a packing engaging the kelly, an inner sleeve housing said packing and having a flange extending below said packing, an outer sleeve having a shoulder beneath said flange, a resilient member between said sleeves and extending inwardly between said flange and shoulder and anti-friction bearings between said outer sleeve and said housing.

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