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W. L. PEARCE
DRILL PIPE SUPPORT

2,575,831

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2 SHEETS—SHEET 1

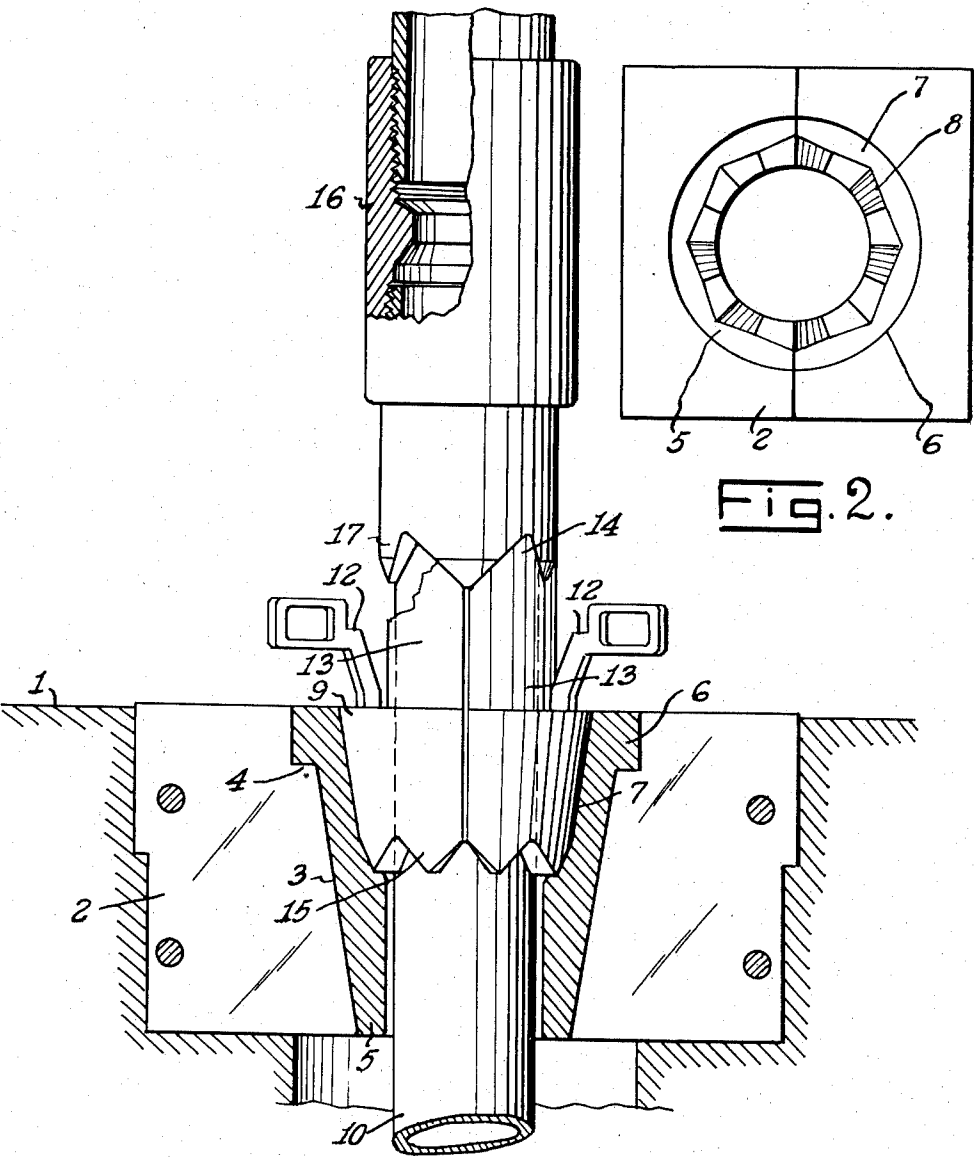


Fig. 2.

Fig. 1.

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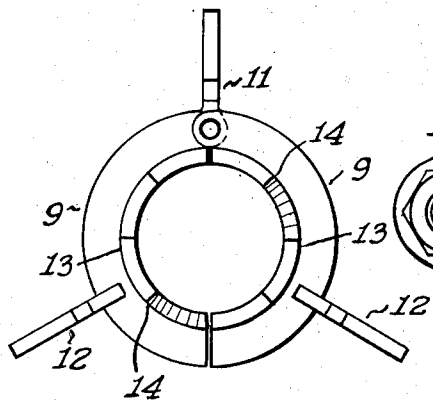


Fig. 3.

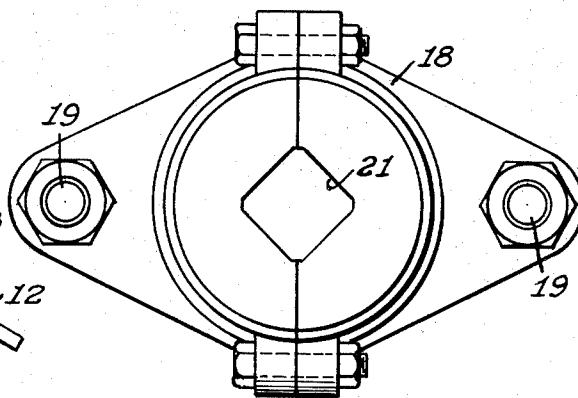


Fig. 5.

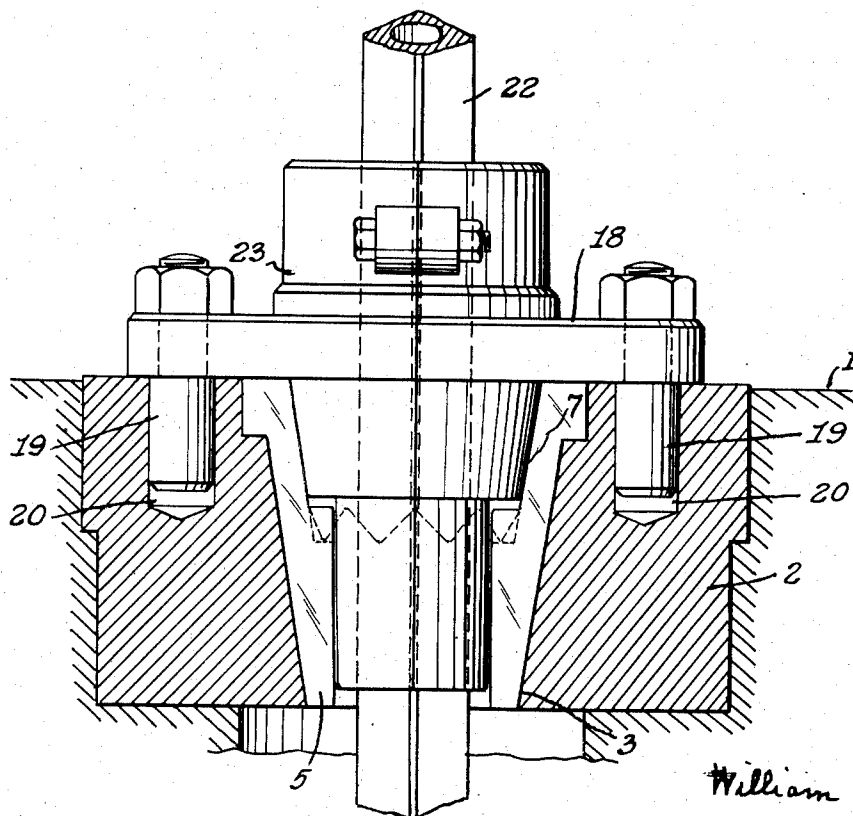


Fig. 4.

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DRILL PIPE SUPPORT

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4 Claims. (Cl. 255—23)

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This invention relates to a drill pipe support. An object of the invention is to provide equipment of the character described specially designed for supporting drill pipe from the rotary drilling machine while the drill pipe is being withdrawn from the well bore and broken up into sections.

It is another object of the present invention to provide equipment of the character described which will effectively hold the string of pipe in the well against turning while the upper sections are being broken out in withdrawing the drill pipe from the well.

It is a further object of the invention to provide equipment of the character described which, in part, may be used in combination with the master bushing of the drilling machine for driving the drill stem during the ordinary course of drilling operations.

Other objects and advantages will be apparent from the following specification which is illustrated by the accompanying drawings, wherein:

Figure 1 is an elevational view, partly in section, of the drill pipe support showing the drill pipe being supported thereby.

Figure 2 is a top plan view of the adapter bushing employed.

Figure 3 is a top plan view of the supporting slips employed.

Figure 4 is a fragmentary, vertical, sectional view of a rotary drilling machine with the adapter bushing therein and the Kelly bushing thereon, and

Figure 5 is a plan view of the Kelly bushing.

Referring now more particularly to the drawings the numeral 1 designates the rotary table of a conventional rotary drilling machine.

Seated in this rotary table there is the conventional master bushing 2 which is preferably formed of two sections bolted together, as indicated in Figure 1, and which is preferably rectangular in horizontal cross-section.

This master bushing is provided with a downwardly converging seat 3 whose upper end is enlarged forming an annular, upwardly facing, supporting shoulder 4.

In the seat 3 there is an adapter bushing 5 whose upper end is formed with an external annular flange 6 adapted to fit into the enlarged upper end of the seat 3 and to rest on the shoulder 4. The adapter bushing is, preferably, formed of two halves, as indicated in Figure 2.

The lower end of the adapter bushing is in-

ternally cylindrical in shape and its upper end is formed into an upwardly flared seat 7.

The lower end of the seat 7 is formed with an internal shoulder having upwardly directed serrations or teeth 8 therearound which are shaped substantially in the form of equilateral triangles, as illustrated in Figure 2.

There are the drill pipe supporting slips, as 9, 9. As illustrated in Figure 3 these slips are formed of two, complementary arcuate sections or halves which are hinged together at one side so that they may be opened and closed about the drill pipe 10. The slips are provided with suitable handles or grip members, one handle 11 being connected to the hinge of the slips and the other handles 12, 12 being connected to the slips adjacent their free ends so that the slips may be handled, opened or closed.

The upper ends of the slips are reduced in diameter forming the upward arcuate extensions 13, 13 whose upper ends are serrated thus forming teeth 14 terminating in sharp apices. The lower ends of the slips are also serrated forming the teeth 15 shaped substantially in the form of equilateral triangles having downwardly directed apices.

These teeth 15 intermesh with the serrations 8 of the adapter bushing when the slips are seated in said bushing.

The drill pipe 10 is formed of sections connected by a suitable coupling or tool joint 16 and the upper end of each drill stem section is thickened to provide an exterior shouldered portion formed with the downwardly directed teeth or serrations 17 terminating in apices and being of a size and shape to intermesh with the teeth or serrations 14 of the slips. During the withdrawal of the drill stem the drill stem is raised until the uppermost section is above the rotary table, and the slips are positioned about the stem and seated in the adapter bushing. Downward movement of the stem will then engage the teeth 17 on the upper end of the next lower section with the teeth 14 of the slips, whereupon the uppermost stem section can be uncoupled and removed.

The slips are held against rotation in the adapter by the weight of the drill stem, which holds the teeth 15 of the slips in interengagement with the teeth 8 of the adapter bushing, and because of the inclined surfaces of these teeth, the teeth will slip if the force applied to the drill stem becomes too great in breaking the sections apart. In this manner, the inter-meshing teeth are prevented from being sheared off or otherwise damaged in disconnecting the sections of

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the drill stem. In order to disconnect the sections of the drill stem, the section above the slips is held against rotation by suitable means, such as a wrench, while the rotary table is rotated to break the stem.

While carrying on drilling operations the slips, shown in Figure 3, will be removed and a Kelly bushing 18 will be mounted on the rotary table.

This Kelly bushing is formed of two parts bolted together and has the depending posts 19, 19, one at each end, to fit into the bores 20 in the conventional master bushing 2. This Kelly bushing has a central square opening 21 extending axially through it to snugly receive the grip joint 22 of the drill pipe and by means of which the drill pipe is rotated during ordinary drilling operations.

This Kelly bushing includes the vertical extension 23 whose lower end is tapered to fit snugly into the tapered upper end 7 of the adapter bushing 5.

It will thus be noted that the adapter bushing 5 is so shaped as to accommodate either the slips 9 while withdrawing the drill pipe from the bore as well as to accommodate the Kelly bushing while drilling and the serrations are all tapered to apexes so that they will readily intermesh.

The drawings and description are illustrative while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. Drill pipe supporting means comprising, an adapter bushing shaped to fit into a seat of a rotary drilling machine and having an inside downwardly tapering seat terminating in an internal shoulder provided with upwardly directed teeth in the shape of equilateral triangles, pipe supporting slips shaped internally to fit around a drill pipe and shaped externally to fit into said seat and whose lower end is provided with downwardly directed teeth formed in the shape of equilateral triangles to intermesh with the upwardly directed teeth of the bushing thus forming interengaging means which prevent the rotation of the slips in the bushing, and means on the upper end of the slips adapted to interlock with complementary means on a drill pipe above, to prevent rotation of the supported pipe and coupling.

2. Drill pipe supporting means comprising, an adapter bushing which tapers downwardly, externally, and whose upper end has a downwardly

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tapering internal seat whose lower end is formed with an internal shoulder provided with upwardly directed teeth in the shape of equilateral triangles, a sectional slip which is shaped, externally, to fit into said seat and whose lower end is formed with downwardly directed teeth in the shape of equilateral triangles to intermesh with the lower end of the seat, the upper end of the slip extending above the bushing and being serrated.

3. Drill pipe supporting means comprising, an adapter bushing which tapers downwardly, externally, and is formed of vertical sections, and with a downwardly tapering inside seat, at its upper end, a sectional slip which is shaped, externally, to fit into said seat and is shaped internally to fit around a pipe, complementary intermeshing teeth in the shape of equilateral triangles carried by the lower end of the slip and the lower end of said seat, respectively, to prevent relative rotation of the slip and adapter, the upper end of the slip extending above the seat, when the slip is seated, and said extended upper end terminating in upwardly directed teeth.

4. Drill pipe supporting means comprising, an adapter bushing which tapers downwardly, externally and is formed of vertical sections, and with a downwardly tapering inside seat, at its upper end, a sectional slip which is shaped, externally, to fit into said seat and is shaped internally to fit around a pipe, complementary intermeshing teeth in the form of equilateral triangles carried by the lower end of the slip and the lower end of said seat, respectively, to prevent relative rotation of the slip and adapter, the upper end of the slip extending above the seat, when the slip is seated, and said extended upper end terminating in means adapted to intermesh with similar means on the pipe coupling to prevent rotation of the coupling relative to the slip.

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