Sept. 27, 1932. B. E. PARRISH ET AL 1,879,455

GRIEF STEM

Filed Jan. 2, 1931 2 Sheets-Sheet 1

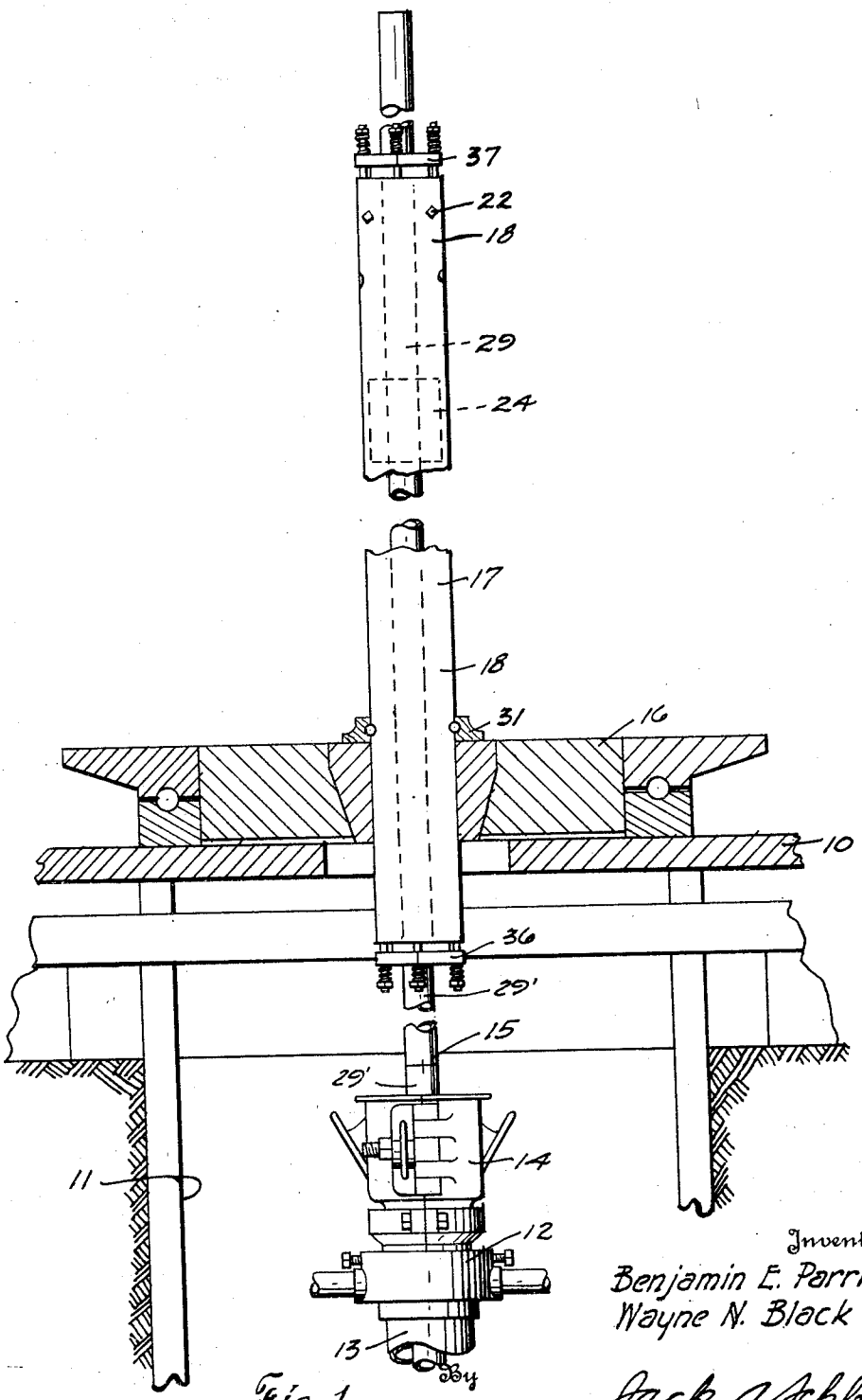



Fig. 1

Inventor
Benjamin E. Parrish
Wayne N. Black

By Jack A. Ashley
Attorney

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GRIEF STEM

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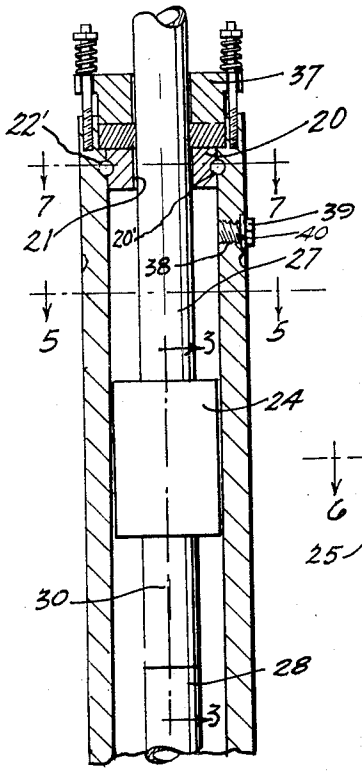
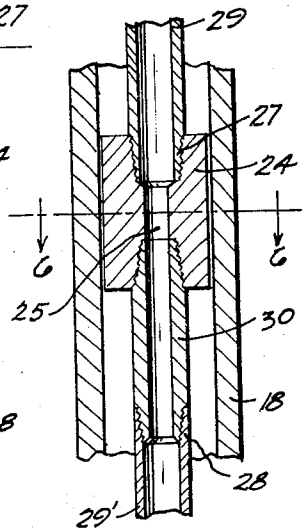



Fig. 3



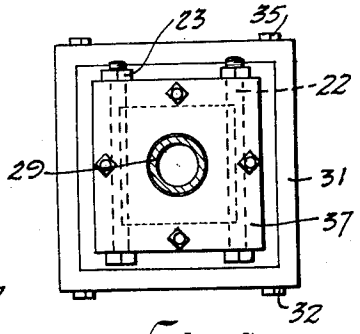




Fig. 4

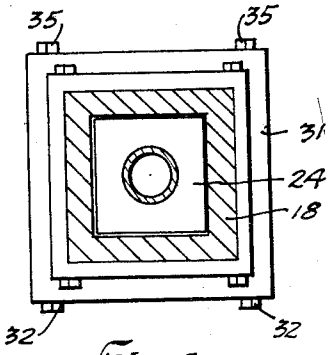



Fig. 5

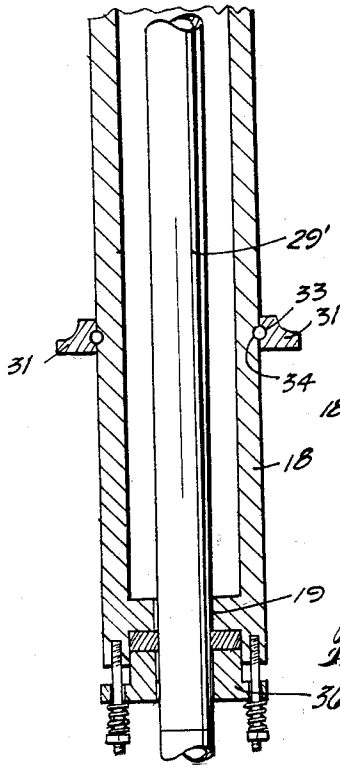



Fig. 2

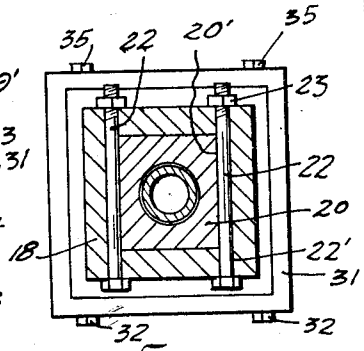



Fig. 7

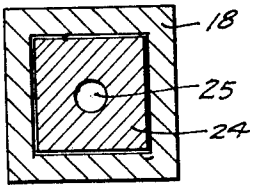



Fig. 6

Inventor
Benjamin E. Parrish
Wayne N. Black

By

Jack A. Ashley
Attorney

Patented Sept. 27, 1932

1,879,455

# UNITED STATES PATENT OFFICE

BENJAMIN E. PARRISH, OF CODY, WYOMING, AND WAYNE N. BLACK, OF TUXPAN, MEXICO, ASSIGNORS OF ONE-HALF TO J. H. REYNOLDS, OF HOUSTON, TEXAS

## GRIEF STEM

Application filed January 2, 1931. Serial No. 506,178.

This invention relates to new and useful improvements in grief stems.

With the grief stems now commonly used in rotary well drilling where a tubing stripper or the like is mounted on the drilling line, it is only possible to connect short lengths of drill pipe in the drilling line because of the limited space between the rotary table and the tubing stripper. As short lengths of drill pipe are used, it is necessary to frequently connect additional drill pipe in the drilling line and for assisting in these frequent connections, a hydraulic jack and its relative machinery is commonly used.

One object of the invention is to provide a grief stem which when used in combination with a tubing stripper or the like, will permit full length sections of drill pipe to be connected in the drilling line, thereby eliminating the need of a hydraulic jack and other expensive equipment and also making for faster and likewise more efficient drilling.

Another object of the invention is to provide a grief stem which when used in a drilling line on which a tubing stripper or the like is not mounted, will permit two full length sections of drill pipe to be connected at the same time in the drilling line, whereby a depth equal to the two section lengths may be drilled before additional drill pipe need be connected in the drilling line.

A further object of the invention is to provide a grief stem which will permit flush joint drill pipe to be used in the drilling line.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings in which an example of the invention is shown, and wherein:

Figure 1 is a sectional elevation showing a grief stem constructed in accordance with the invention, mounted on a rotary table and in a drilling line above a tubing stripper,

Figure 2 is a vertical sectional view of the grief stem,

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 2,

Figure 4 is a plan view of the grief stem,

Figure 5 is a cross sectional view taken on line 5—5 of Figure 2,

Figure 6 is a cross sectional view taken on line 6—6 of Figure 3, and

Figure 7 is a cross sectional view taken on line 7—7 of Figure 2.

In the drawings the numeral 10 designates a derrick floor having therebeneath a cellar 11. A casing head 12 is mounted within the cellar on top of the well casing 13. A tubing stripper 14 is mounted in the casing head around the drilling line 15 which extends upwardly through the derrick floor and a rotary table 16 that is mounted on said floor. Parts which are not necessary for a clear understanding of the invention have been omitted.

In the drilling line we connect a grief stem 17, comprising an elongated hollow drive shaft 18 which is square in cross section and has a reduced circular opening 19 at one end and a removable plug 20 at its other end. The plug has a circular opening 21 similar to the opening 19 and is secured in the end of the shaft by through bolts 22 engaging in grooves 22′ in the shaft and grooves 20′ in the plugs. Nuts 23 are screwed onto the ends of the bolts to prevent displacement of the same.

A drive block 24 square in cross section and having a circular bore 25, is slidably mounted within the shaft 18 for rotation therewith. The lower end 27 of a full length section of drill pipe 29 is screwed into the top of the drive block while a short tool joint connector 30 is screwed into the bottom of the drive block for connecting the upper end 28 of a section of drill pipe 29′ with said drive block. The shaft and the sections 29 and 29′ are approximately the same length, but as the drive block 24 connects the sections 29 and 29′, the outer ends of said sections will extend through the openings 19 and 21 regardless of the position of the drive block within the shaft, thereby permitting the easy and convenient connection of additional sections of drill pipe to the lower end of the section 29′. The upper section 29 is connected to the rotary swivel, (not shown) or other suitable supporting apparatus.

Suitable stuffing boxes 36 and 37, through which the sections 29 and 29′ extend are provided at opposite ends of the shaft to seal the same, whereby a suitable lubricant such as oil may be contained within the shaft so that the drive blocks 24 will run in said lubricant. A filling port 38 provided at the top of the shaft is sealed by a plug 39 and a gasket 40. For adjustably mounting the shaft in the rotary table, a square collar 31 provided on the shaft may be secured thereto at either end of said shaft by means of through bolts 32 engaging in grooves 33 in the collar and grooves 34 in the shaft. The bolts are secured in these grooves by nuts 35.

When the grief stem is used in a drilling line in combination with a tubing stripper or the like, the collar is secured at the bottom of the shaft, as is shown in Figure 1, whereby the major portion of the stem will extend above the rotary table. When a tubing stripper is not used on the drilling line the shaft is mounted in the rotary table with the collar secured at the bottom of the shaft until the drive block reaches the bottom of the shaft, then the collar is adjusted and secured at the top of the shaft whereby the drive block will be positioned at the top of said shaft and may again descend the length of the shaft before it is necessary to raise the same for connecting additional sections of drill pipe in the drilling line.

In operation, the tubing stripper mounted on the drilling line, a full length section of drill pipe is connected in the drilling line at the bottom of the section 29′. Then by rotating the rotary table 16, the shaft is likewise rotated and imparts its rotation through the drive block to the drilling line. The drive block will descend in the shaft as the depth of the well increases and when said drive block reaches the bottom of the shaft the drilling is discontinued. The drilling line, including the grief stem is then lifted until slips (not shown) can be engaged around the section of drill pipe below the section 29′ to support the drilling line. The lower section 29′ is then disconnected from the drilling line and the grief stem is lifted sufficiently for connecting an additional full length section of drill pipe in the drilling line. The slips are then removed from the drilling line and the grief stem is again engaged in the rotary table with the drive block at the top of the shaft, and drilling is again resumed.

It is pointed out that with this type of drill stem, full length section of drill pipe may be connected in a drilling line on which a tubing stripper is mounted, thus eliminating the need of particular, expensive equipment, and making for convenience and efficiency in drilling.

Also that on wells in which the drilling is not advanced or where there is no danger of the well coming in, and likewise no need of a tubing stripper, two full length sections of drill pipe may be connected in the drilling line at the same time as hereinbefore stated, thus greatly increasing the drilling speed.

Various changes in the size and shape of the different parts, as well as modifications and alterations, may be made within the scope of the appended claims.

What we claim, is:

1. In a grief stem, a rotary drive shaft having an angular exterior, means for mounting said shaft on a drill line, and means connected in the drill line for slidably engaging with the shaft throughout its length to impart rotation to said drill line.

2. In a grief stem, a square hollow drive shaft for engaging in a rotary table, a drive block slidable within the shaft and mounted for rotation therewith, and means for connecting the drive block in a drill line.

3. A grief stem as set forth in claim 2 with means for containing a lubricant within said shaft.

4. A grief stem as set forth in claim 2 with means for adjustably supporting said shaft.

5. In a grief stem, an elongated hollow drive shaft angular in cross-section and adapted to engage in a rotary table, and a non-rotatable element slidable in the shaft having sockets for receiving adjacent ends of the drill pipe.

6. A grief stem as set forth in claim 5 and stuffing boxes at each end of the shaft surrounding the drill stem.

In testimony whereof we affix our signatures.

BENJAMIN E. PARRISH.
WAYNE N. BLACK.