B. F. HINIKER.

INTERNAL ROTARY SPIDER.

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1,273,858.

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Fig. 1

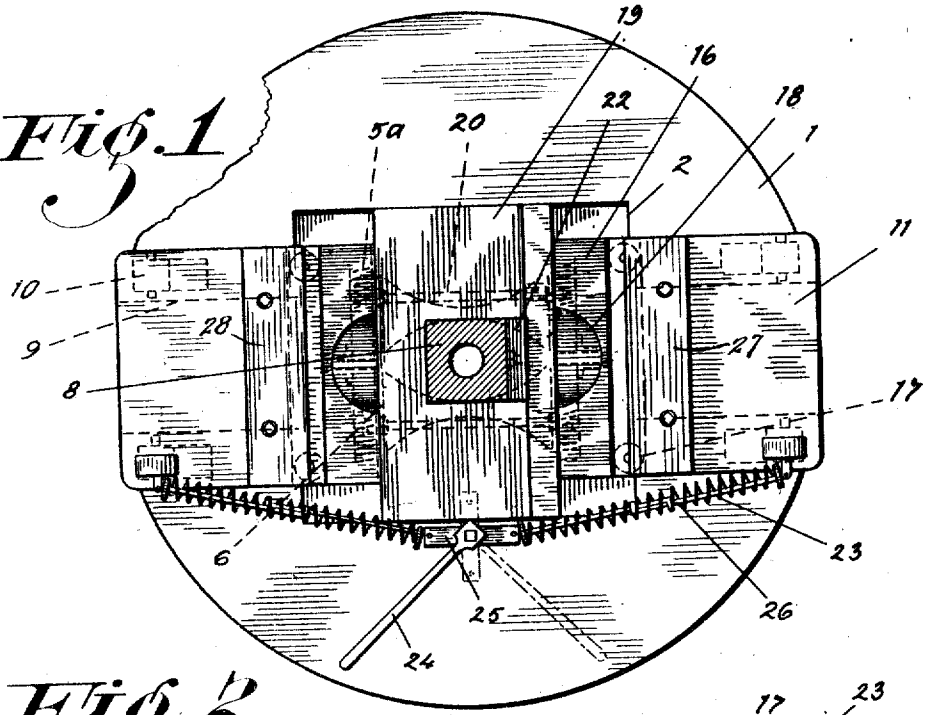
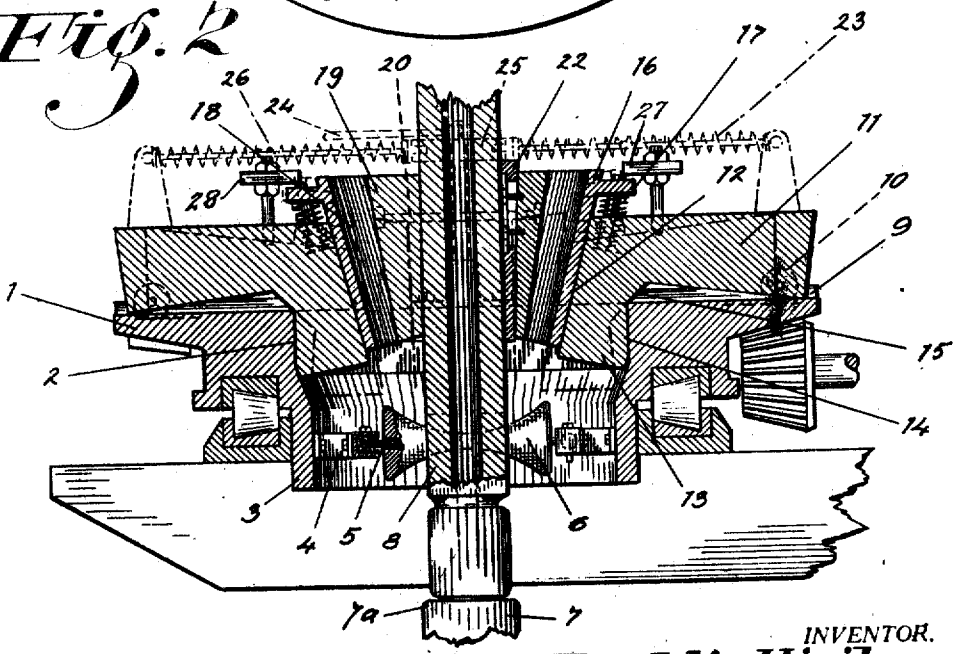


Fig. 2



WITNESS:

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INTERNAL ROTARY SPIDER.

1,273,858. Specification of Letters Patent. Patented July 30, 1918.

Application filed September 4, 1917. Serial No. 189,474.

To all whom it may concern:

Be it known that I, BENJAMIN FRANKLIN HINIKER, a citizen of the United States, residing at Taft, in the county of Kern, State of California, have invented certain new and useful Improvements in Internal Rotary Spiders; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in well drilling machinery and equipment, and particularly to the rotary table, driving bushing and pipe holding slip construction. In the now commonly used types of well drilling machinery, the driving bushing and the pipe retaining slips are independent members and it is necessary each time they are used to manually insert or displace them. This takes a great deal of time and trouble and the operation of such members is also more or less unsatisfactory. The object of my invention is to produce a combined table, slip and driving bushing structure which is left in position on the table and each element thereof can easily and quickly be called into immediate use as required, without the necessity of manually handling the same or removing them from the table.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a top plan view of my improved equipment.

Fig. 2 is a transverse vertical section through the same, showing the drill stem in position in the driving bushing, and a small portion of the pipe suspended below the same.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 designates the rotary table provided with the usual central aperture 2, of desired shape and size. A sleeve 3 extends a slight distance below the table and is provided on each side with a pair of slotted guides 4 movable in which are spring pressed pins 5, turnable on which are spools 6, which act as guides for the pipe 7 as the same is lowered into the well. These guide spools 6 will accommodate pipes of different sizes by reason of their sliding relation within the guides 4, and at the same time they will always be held in constant contact with the pipe by means of the springs 5^a. In the top of the plate 1 are provided guide grooves or slots 9, movable through which are rollers 10 in plates 11. The inner faces of the plates 11 are beveled as at 12 and project downwardly in to the aperture 2. The lower ends of the projections 13 are provided with square outer surfaces which fit directly against the sides of the aperture 2 when the plates 11 are in their most backward position, as shown at 14. The under faces of the plates 11 are cut out so that when such plates are in the backward position as indicated above there is a shoulder 15 on the under side of each plate which shoulders angle slightly away from the sides of the aperture 2, for a purpose as will presently appear.

The slips 16 are mounted for movement down the inclined surfaces 12 and are normally held in their uppermost position by means of the springs 17. Such slips 16 are provided with central grooves 18, arranged to close in against the pipe in a manner as will presently appear. The driving bushing 19 is composed of two parts bolted together by bolts 20 whereby the same may be set on the drill stem 8. It is also provided with a slidable wedge shaped insert 22, interposed between the drill stem 8 and one of the parts of said bushing 19, in order to compensate for any wear between the two. This bushing 19 has tapering sides which fit between the inclined sides of the slips 16 when the same are in their backward position, and hence are held stationary with respect to the rotating table 1, so as to drive the drill stem

with the rotation of such table. When the drill stem is hoisted, however, the shoulder 7ª of the pipe 7 engages the lower end of the bushing 19 and lifts it clear from the slips 16. This brings the pipe 7 centered between the slips 16. The lever 24 is then moved to the position shown by dotted lines in Fig. 1. This action pulls on the slip rods 26 connected between the turnable bar 25 and the plates 11, to which bar 25 the lever 24 is connected, as shown. Thus both of the plates 11 and incidentally the slips 16 simultaneously advance toward the axis of the table. As this is done the shoulders 15 ride downwardly along the edges of the aperture 2. This action brings the sides of the grooves 18 directly into contact with the pipe 7. Then as the pipe 7 is allowed to gravitate slightly downward, the slips 16 tend to move downwardly against the springs 17. Due to the inclined sides of the slips 16 bearing against the inclined walls 12, such slips are wedged securely against the pipe, locking the same against movement. Thereupon the drill stem may be removed for any desired purpose.

When it is desired to again lower the pipe and place the drill stem in driving relation with the table, the pipe 7 is then slightly lifted. This lifting first withdraws the shoulders 15 upwardly out of the aperture 2. The pressure of the springs 23 moves the plates backwardly and draws the slips 16 away from the pipe and the springs 17 act against such slips to cause them to entirely free the pipe. Thereupon the pipe is lowered and the driving bushing 19 moves back into place between the slips 16, and this action continues until such bushing is firmly wedged between the slips.

The upward movement of the slips 16 is limited by means of over-hanging plates 27 mounted on pins 28 disposed on the plates 11.

The drive bushing being beveled on its outer edges is firmly seated at all times, thus eliminating the knock and hammer now common to square bushings. The slips, having the beveled backs as shown, are thus rigid as to side motion and hence a bit inserted between the two front or square faces may be installed or removed by rotating the table.

From the foregoing description it will readily appear that I have provided a combined driving bushing and pipe locking slip construction which may be permanently mounted on the rotating table, and which is able to perform all of the necessary functions without necessitating the removal of any of the parts from the table. The advantages of this will be readily apparent to any one skilled in the art.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfils the object of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:—

1. A device of the character described comprising the combination with an apertured rotating table and a drill stem and pipe projecting therethrough, of a driving bushing and pipe clamps carried by the table, the bushing being normally held in engagement with the table by the clamps when the drill is in operation, and means whereby when the drill stem is lifted the bushing will be freed from the clamps, and means for then moving the clamps into engagement with the pipe.

2. A device of the character described comprising the combination with an apertured rotating table and a drill stem and pipe projecting therethrough, of a driving bushing and pipe clamps carried by the table, the bushing being normally held in engagement with the table by the clamps when the drill is in operation, and means whereby when the drill stem is lifted the bushing will be freed from the clamps, and means for then moving the clamps into engagement with the pipe, such latter means including a lever and rods interposed between the lever and clamps whereby when the lever is operated the clamps will be moved toward the axis of the table, and springs to push the clamps back when the lever is released.

3. The combination with a rotating drill table, of a means for clamping pipe stationary with respect to the table such means comprising clamps movable radially of the axis of the table, lever controlled rods for drawing the clamps together and springs to push them apart.

4. The combination with a rotary drill table having oppositely disposed clamps, a drill stem and pipe movable between the clamps, a driving bushing on the drill stem engageable by the clamps to place the drill stem in driving relation with the table, and means on the pipe engageable with the bushing to raise it free of the clamps when the pipe is raised.

5. The combination with a rotary drill table having oppositely disposed clamps, a drill stem and pipe movable between the clamps, a driving bushing on the drill stem

engageable by the clamps to place the drill stem in driving relation with the table, and means on the pipe engageable with the bushing to raise it free of the clamps when the pipe is raised, and means for then moving the clamps into engagement with the pipe.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN FRANKLIN HINIKER.

Witnesses:
F. L. JORDAN,
JAMES S. SAVIERS.