

W. G. VREELAND.
 AUTOMATIC SLIP FOR WELL BORING APPARATUS.
 APPLICATION FILED JULY 30, 1917.

1,400,701.

Patented Dec. 20, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

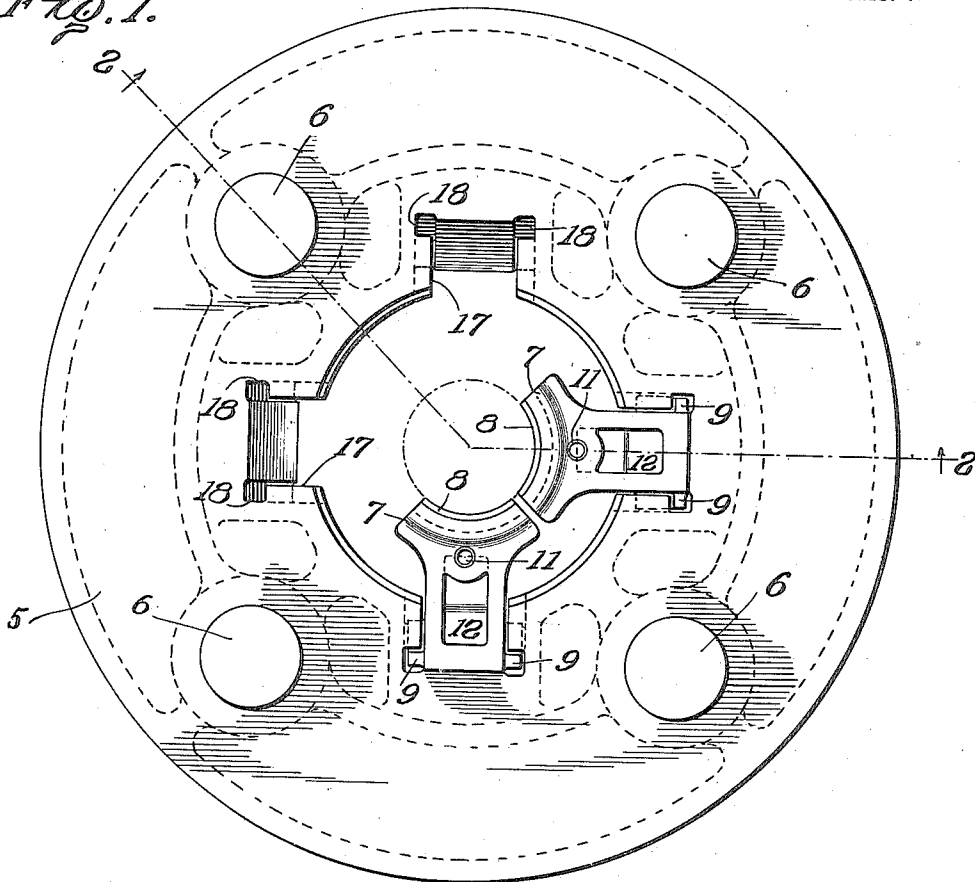


Fig. 3.

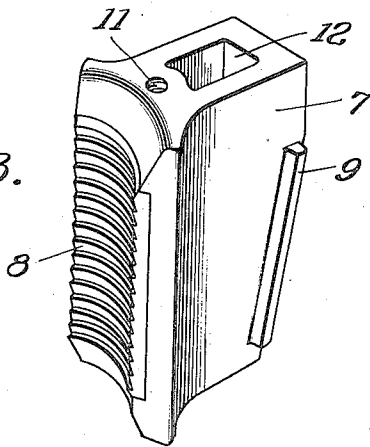
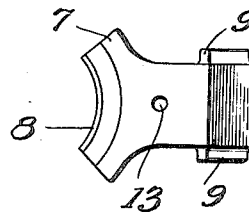


Fig. 4.



Witness

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2 SHEETS—SHEET 2.

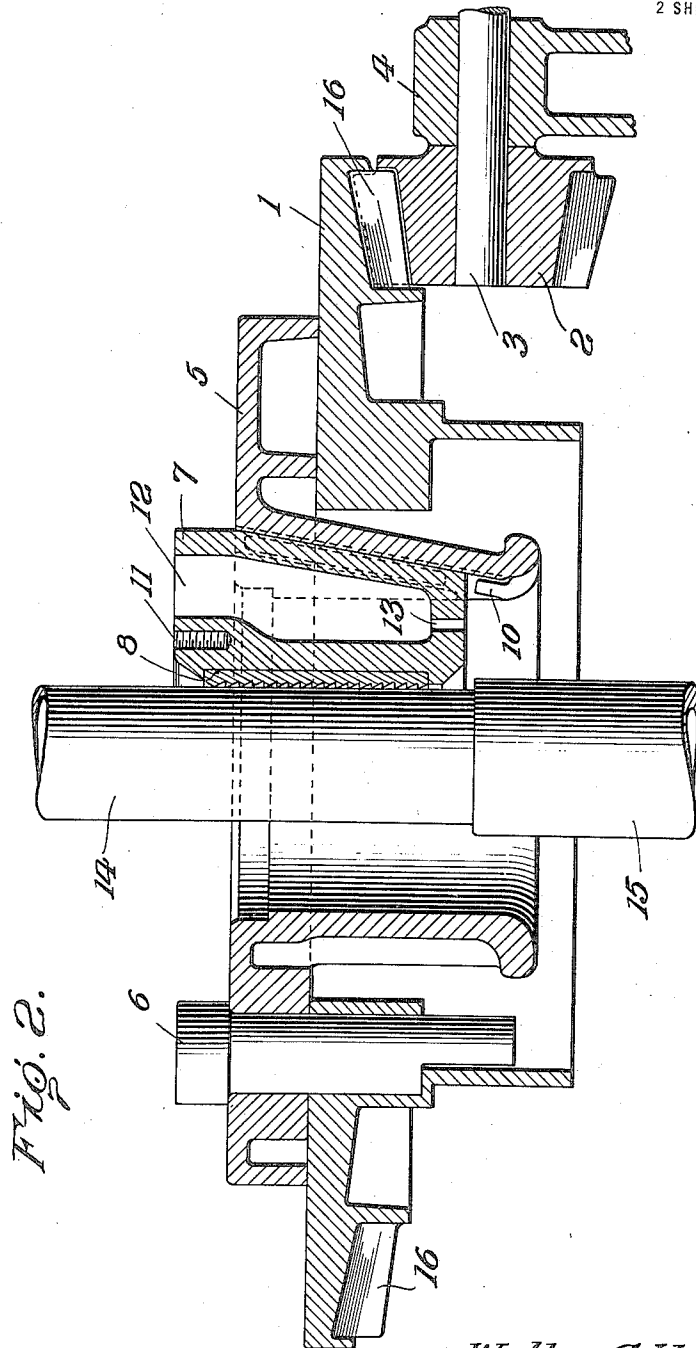


FIG. 2.

Witness

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SLIP FOR WELL-BORING APPARATUS.

1,400,701.

Specification of Letters Patent.

Patented Dec. 20, 1921.

Application filed July 30, 1917. Serial No. 183,533.

To all whom it may concern:

Be it known that I, WALTER G. VREELAND, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Automatic Slips for Well-Boring Apparatus, of which the following is a specification.

This invention relates to the art of well drilling, and more particularly for use with that type of machine which is provided with a rotary table and through which extends the drill string consisting of the drill and drill stem with sections of tubing interposed between them.

In the progress of drilling a well, as the depth increases, it is necessary to detach the drill stem and add sections of tubing on to the upper end of the string. During such operation it is necessary to have some means to hold the drill and the string of tubing at some particular point of elevation while the additional sections of tubing are being connected. This is also necessary when the string is being broken up by removing the successive pipe sections.

Therefore one of the objects of this invention is to provide slips for insertion in the table which will hold the string in suspension and which can be easily withdrawn from and reapplied to the table.

Another object of the invention is to provide means whereby the slips will automatically bind themselves between the drill string and the table.

A further feature of the invention is the provision of means whereby the slips will always have the same wearing surface and not be liable to bear on one spot such as is the case with the ordinary circular shaped slips.

Still another object is to provide means whereby it will be impossible for the slips to fall through between the string and the table.

With the above and other objects in view, I will now proceed to describe one specific embodiment of the invention as illustrated in the accompanying drawings, wherein:

Figure 1 is a top plan view of the master bushing with two of the slips shown in place.

Fig. 2 is a sectional elevation through the line 2—2 of Fig. 1.

Fig. 3 is a perspective of one of the slips. 55
Fig. 4 is a bottom plan view of the slip shown in Fig. 3.

In detail:

In the drawings, 1 is a rotary table provided with teeth 16 on the underside of same, which are geared to the bevel pinion 2, that is supported from the bearing 4 and driven through the shaft 3 by any suitable means not shown.

As is well known in the art, means are generally provided for transmitting rotary motion from the table to the drill stem, but as this has no connection with the present invention, the same has not been shown in the drawings.

I provide a master bushing 5 which is annular in form and is placed within the central opening of the table and held in positive connection with the same by means of the pins 6 which pass through the flange of the bushing and project into the table. In the central bore of the bushing 5, I provide a plurality of openings or recesses such as 17, provided at their outer ends with slots 18, which are inclined inwardly and run parallel with the back face of the recesses 17.

In each of the recesses 17, I place a slip jaw 7 which has a slidable fit in same and is provided with ribs 9 on each side to correspond with the slots 18 in the bushing, and with the outer face of said jaw inclined at an angle to correspond with the back face of the recess 17.

At the lower ends of the slots 18, I provide stops 10 which are in alinement with the ribs 9 and if the slip jaws are allowed to recede far enough into the bushing 5, the stops 10 and ribs 9 will come into contact, thereby preventing further downward movement of the slips and the possibility of losing the same in the well. On the inner face of each of the slips, I have embedded therein a liner 8 with a serrated surface, which can be easily replaced when it has become worn by the continuous contact with the tubing. I have provided screw threaded holes 11 in each of the slips, into which some convenient tool can be inserted for the handling of the jaws. I have also found it advisable to core a hole such as 12 in the slips so as to eliminate a considerable amount of unnecessary weight without sacrificing the strength of the slips. A hole 13 in the lower

side of the slip allows for the drainage of moisture which is liable to collect in the hole 12.

It will be seen that with the pipe string in place my slips can be inserted in the recesses 17 and by means of the flat inclining surface in the back of same, together with the corresponding face on the slips, the slips will automatically place themselves in position to give a binding action to the tubing and together with the serrated surface on the inner liner, will prevent further downward movement of the pipe string until the slips have been released.

While I have shown and described a master bushing in combination with the table and slips, I want it to be understood that I can make provision for connecting the slips directly to the table, or any other practical modifications which will come within scope of the appended claims.

I claim:

1. The combination with a rotary table, of a bushing carried by the table, slips slidably secured in the bushing and projecting into the bore thereof, and stops for limiting the downward movement of the slips in the bushing, said stops being formed from said bushing in the form of prongs projecting inwardly and upwardly into the bore of the bushing.

2. The combination with a rotary table, of

a centrally disposed bushing having radially disposed slots extending outwardly from the bore thereof and laterally disposed slots extending from the sides of the radial slots, slips slidably secured in the slots, said slips having lateral ribs on their side walls engaging in the lateral slots in the bushing, and stops formed on the bushing and projecting into the lateral slots below the slips and adapted to engage the ribs on said slips.

3. The combination with a rotary table, of a centrally disposed bushing having radially disposed slots extending outwardly from the bore thereof and laterally disposed slots extending from the sides of the radial slots, slips secured in the radial slots, laterally projecting ribs on the sides of the slips adapted to engage in said lateral slots, said ribs terminating above the lower ends of the slips, and stops formed on the bushing in alinement with the lateral ribs whereby the slips are free to move downwardly to a position where their lower ends will be below the stops.

In witness whereof I set my hand and affix my signature in the presence of two subscribing witnesses.

WALTER G. VREELAND.

Witnesses:

H. L. THATCHER,

C. H. McCOLLUM.