Sept. 16, 1924. 1,508,882

C. C. HOSMER ET AL

ROTARY DRILL PIPE SLIP

Filed Jan. 19, 1923

Fig. 1.

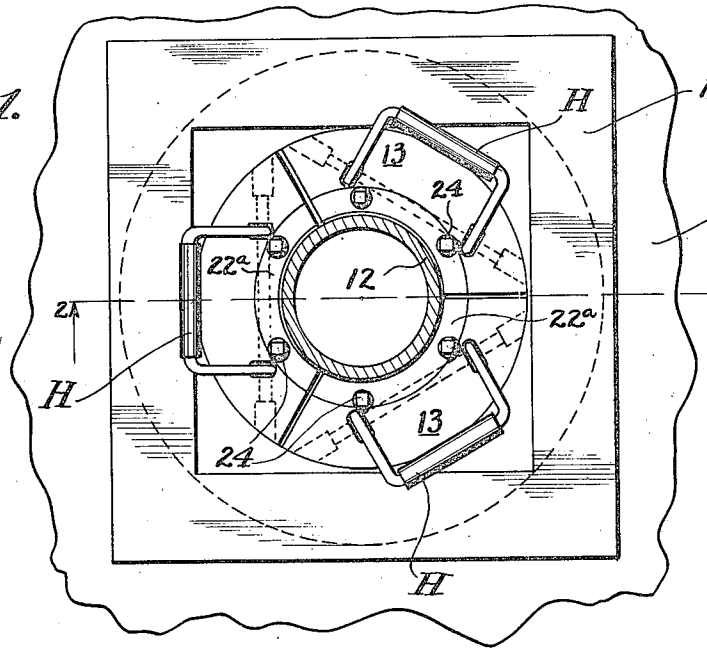


Fig. 2.

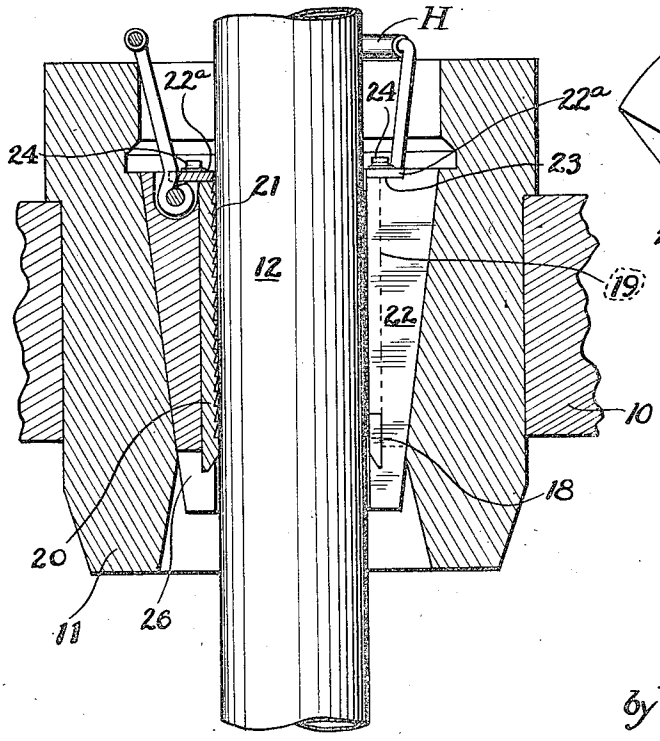


Fig. 3.

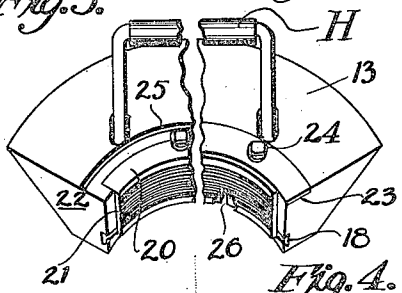
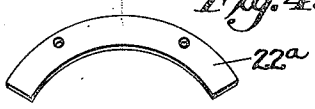


Fig. 5.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTARY-DRILL PIPE SLIP.

Application filed January 19, 1923. Serial No. 613,616.

To all whom it may concern:

Be it known that we, CHESTER C. HOSMER and CARLETON H. WINES, citizens of the United States, residing at Huntington Beach, county of Orange, and Whittier, in the county of Los Angeles and State of California, respectively, have invented new and useful Improvements in Rotary-Drill Pipe Slips, of which the following is a specification.

Our present invention relates to a rotary drill pipe slip, this being a form of pipe slip having certain advantages over the slip described in our Patent No. 1,414,951, granted May 2, 1922.

It is an object of our present invention to provide a pipe slip which shall be securely held but which may nevertheless be conveniently and quickly removed, as renewals may require.

It is a further object of our invention to provide a pipe slip with a liner which, although adapted to be inserted or removed by a rectilinear movement in the direction of its length, shall nevertheless be held by what may be termed a "dovetailing" connection or engagement with a segment of our pipe slip.

Further objects of our present construction are to minimize the number of parts required, to simplify the construction, to perfect the mode of manufacture and assembly, and to facilitate the use of pipe slips of general character referred to, our pipe slip being easily made and adapted to be sold at a moderate price.

With the foregoing and other objects in view, our invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed, preferred forms being illustrated in the accompanying drawings, in which

Figure 1 is a top plan view of a portion of a rotary drill table provided with and showing slips of our improved construction.

Fig. 2 is a vertical section approximately on the line 2—2 of Fig. 1.

Fig. 3 is a fragmental perspective view of one segment of a slip employed in one form of our invention.

Fig. 4 shows separately one form of securing plate suitable for use in the organization shown in Fig. 3.

Fig. 5 shows in a fragmental perspective view an alternative construction hereinafter referred to.

Referring by numerals to the accompanying drawings, which illustrate one practical embodiment of our invention and alternative securing means which may be used therein, 10 designates a drill table, 11 the usual master bushing which is carried by said table, and 12 the rotary drill pipe that passes through said bushing and downward into the drill hole. The bushing may be square at the top, as shown in Fig. 1, and round at the bottom, as indicated by the large circle dotted thereon.

As in our former patent mentioned, the slips contemplated by our present invention are in the form of segments, each of which comprises a body 13 that is wedge-shaped in vertical or longitudinal section and of arcuate shape in cross section. We prefer to so form the segmental slip members that, for example, three of them will cooperate to form a tapered sleeve which may be positioned within the bushing 11 around the drill pipe 12, although the number of the segments may be varied as desired, it being advantageous that each segment shall be of suitable weight to be lifted by one workman.

Formed in the top of each segmental slip body there may be a pair of recesses which are adapted to be occupied by loops that are connected with or form part of handles H, in the manner set forth in our mentioned patent; and the inner curved face of each slip body is adapted to retain a liner, the respective slip bodies being preferably provided with a transversely curved channel 18,—to facilitate the subsequent cutting of a longitudinal channel 19, shown as of substantially uniform depth, into which is removably placed, by a rectilinear movement, a hardened metal liner plate 20, shown as substantially uniform in thickness except that the outer face of each liner plate is provided with ribs or teeth 21, the points of which are shown as upwardly presented. In the present form of our invention, these liner plates, which are intended to directly engage the surface of the rotary drill pipe, are retained in position against lateral or forward displacement by what may be regarded as a dovetailing lateral engagement with the segmental slip body, the channel 19 being laterally terminated at 21 by sur-

faces which may be parallel with the lateral faces 22 of the respective segmental slip bodies.

In order still more firmly to retain the liner plates 20 within the recesses 19, the lower edge of each of said recesses may also be undercut or dovetailed as shown, the lower ends of the liner plates being correspondingly shaped. The liner plates of the improved construction shown may then be inserted and secured to the bodies of the slips 13, being advanced from one end, that is the top thereof, by a vertical or rectilinear movement; and after said liner plates have been properly positioned in said recesses they may be regarded as fitted within a pocket, within which they may be locked by any suitable means, such as the plates 22^a, shown as secured in channels 23 by cap screws 24. In Fig. 5 a single cap screw 25 is alternatively shown as securing the liner.

The slips of our improved construction may be readily handled to position the same within or to remove them from the bushing 11 of a drill table, and the teeth on the outer face of the liner plates 20 are then effective in engaging and firmly holding the rotary drill pipe against downward movement, as may be necessary when sections are being added thereto or separated therefrom. In our improved construction, especially when the channel 19 is not tapered, and we do not prefer to taper it, the liner plates may be very readily removable, there being no curvature in the direction of their advance. In view of the readiness with which the liner plates may be removed, it is not really necessary to cut away the center of any segment at the bottom thereof, in the manner shown at 26 in Figs. 2 and 3.

In the manufacture of our rotary drill pipe slip, we prefer to cast at one time the three segments which are adapted to cooperate, suitable temporary webs being left therebetween, and we may then true up and machine the three segments, cutting the described channels therein, before they are separated, the liners being thereafter inserted by an endwise movement from the top, and the handles being optionally attached. In the separating of the segments, preferably upon radial lines, sufficient metal may be cut away to enable them to be subsequently wedged into place within the master bushing 11 before they come into lateral contact with one another.

The device of our improved construction is comparatively simple, comprising fewer parts than the device of our mentioned patent. It is capable of being easily and cheaply produced, and it provides efficient means for engaging and holding a rotary drill pipe in the bushing of a drill table.

It will be understood that parts or features of our invention may be independently used, and that various changes in size, form and construction of the respective parts of our improved rotary drill pipe slip may be made, and equivalent elements might be substituted for those herein shown and described, without departing from the spirit and scope of our invention as the same is indicated above and in the following claims.

What we claim is:

1. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel adapted to retain a liner against outward displacement therefrom said liner being of substantially uniform thickness and engaged at its edges by the sides forming the channel.

2. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel of substantially uniform depth adapted to retain a liner of substantially uniform thickness against outward displacement therefrom by a dovetail engagement at the sides thereof.

3. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel of substantially uniform depth adapted to retain a liner of substantially uniform thickness against outward displacement therefrom by a dovetail engagement at the sides thereof and at the bottom thereof.

4. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with means for retaining a liner of substantially uniform thickness in a pocket therein, said liner being engaged at the edge by the retaining means.

5. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel adapted to retain a liner of substantially uniform thickness and with means for removably securing a liner therein, said liner being engaged at its edge by the sides forming the channel.

6. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel adapted to retain a liner of substantially uniform thickness against outward displacement therefrom by a dovetail engagement at the sides thereof, and means for removably securing a liner therein.

7. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel adapted to retain a liner of substantially uniform thickness against outward displacement therefrom by a dovetail engagement at the sides thereof and at the bottom thereof, and means for removably securing a liner therein.

8. In a pipe slip, a retaining segment adapted to cooperate with a rotating table and a liner plate of substantially uniform thickness adapted to be inserted at the top of the retaining segment, and dovetail

means on said segment for engaging said plate at the edges and on three sides thereof.

9. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel and with a liner of substantially uniform thickness adapted to enter at one end thereof and to be retained by a lateral engagement of its edges therewith.

10. In a pipe slip, a segment adapted to cooperate with a rotating table and provided with a longitudinal channel of substantially uniform depth open at one end and closed at the other and having a lateral curvature.

In testimony whereof we have signed our names to this specification.

CHESTER C. HOSMER.
CARLETON H. WINES.