June 27, 1933. M. J. WOZNACK 1,915,345

DRILL PULLER

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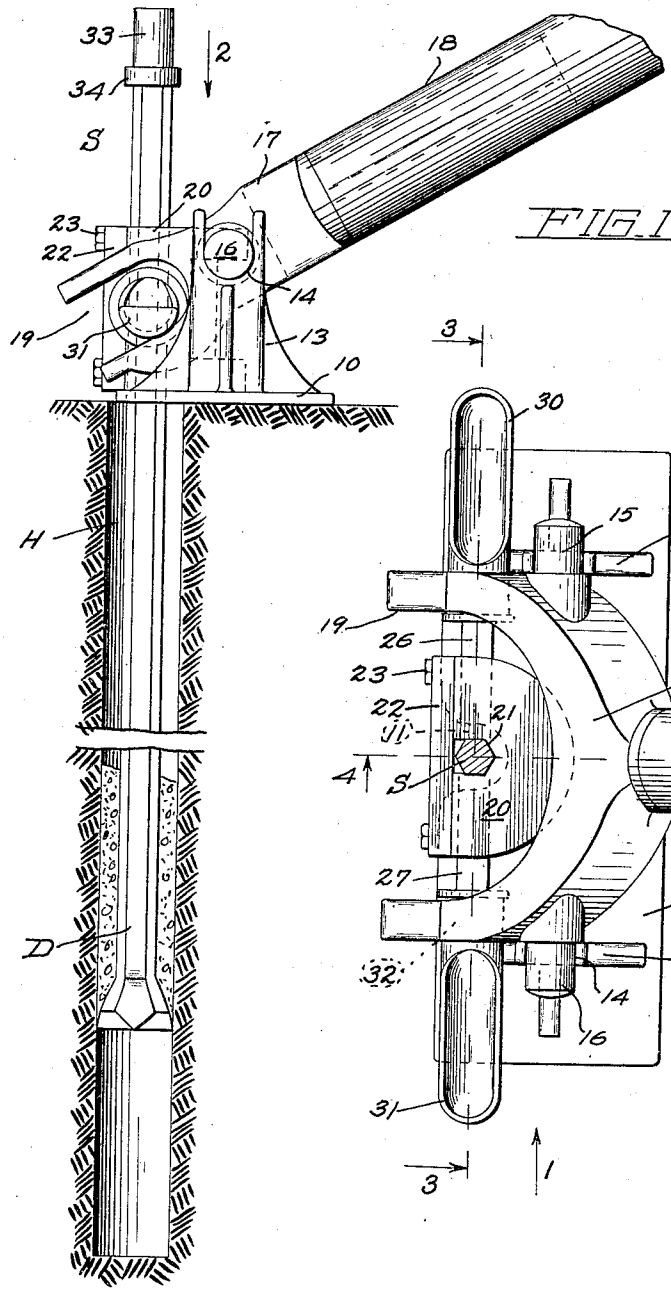


FIG. 1.

FIG. 2.

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FIG. 3.

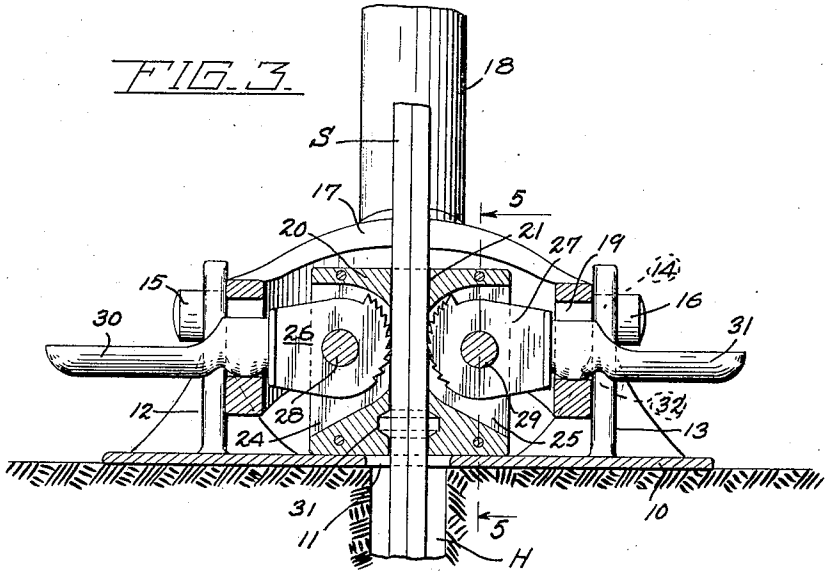


FIG. 5.

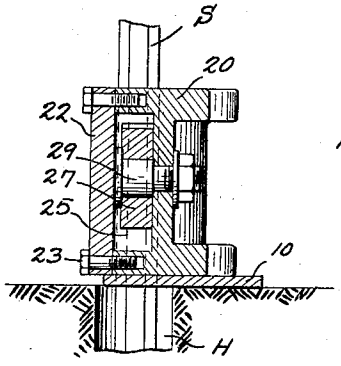
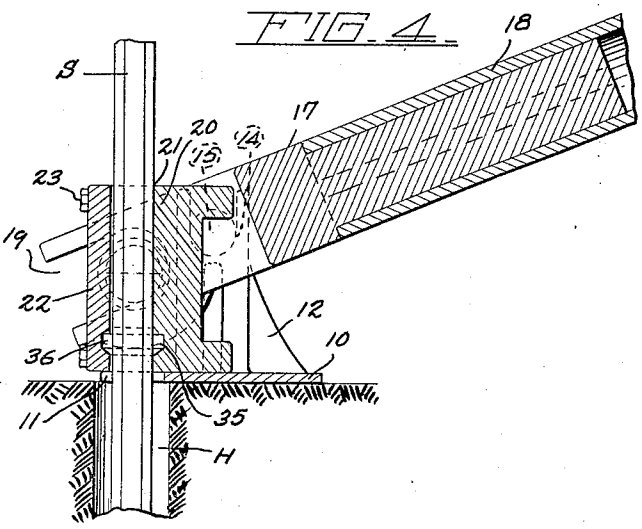


FIG. 4.



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UNITED STATES PATENT OFFICE

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DRILL PULLER

Application filed October 14, 1931. Serial No. 568,825.

This invention relates to improvements in drill pullers.

An object of the invention is to provide a device which can be easily and quickly applied to the stem of a rock drill or the like which will facilitate withdrawing the drill from the drill hole. In using rock drills of the percussion type in drilling through rock, concrete, or similar substances, it frequently occurs that the drill becomes jammed or wedged in the drill hole so that it is very difficult to extricate it. The improved construction is so designed that it will effectively grip upon the drill stem and will have a sufficient mechanical advantage present to enable the drill to be pulled easily from the drill hole.

Another object of the invention is to provide a drill puller having a drill stem embracing member on which there are drill stem grips and an elevating construction operable upon the grips to cause them to grip on the drill stem and then elevate it. The design is such that the greater the lifting effort, the greater the grip will be upon the drill stem.

Still another object of the invention is to provide a drill puller which is so designed as to permit successive lifts of the drill to be easily and quickly accomplished by the device.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Fig. 1 is a partial view in side elevation illustrating the improved drill puller in applied position on a drill which has become fast within its drill hole, the drill hole being illustrated in vertical section.

Fig. 2 is a top plan view taken in the direction of the arrow 2 upon Figure 1, the drill being illustrated in horizontal section.

Fig. 3 is a vertical section taken substantially upon the line 3—3 upon Figure 2.

Fig. 4 is a vertical section taken substantially upon the line 4—4 upon Figure 2.

Fig. 5 is a vertical section taken substantially upon the line 5—5 upon Figure 3.

Referring to the accompanying drawings, wherein similar reference characters designate similar parts throughout, the improved drill puller comprises a base 10 having an arcuate recess 11 near its center adapted to be positioned over a drill hole H within which a drill D may have been drilling and become fast. The base 10 has a pair of opposed upright standards 12 and 13 having notches in their upper ends indicated at 14 for the reception of trunnions 15 and 16 on a bifurcated or forked lever 17. This bifurcated or forked lever, which is fulcrumed on the base by means of the trunnions, may have a removable tubular handle 18. The arms or sides of the bifurcated or forked lever 17 are slotted at their forward ends as indicated at 19. Within the forked lever 17 there is a drill stem embracing member 20 which is adapted to be caused to embrace the stem of the drill S. This drill stem embracing member has a vertical groove 21 formed thereon adapted to receive the stem S and is provided with a removable forward plate 22 which may be secured in place as by screws 23. In the sides of the drill stem embracing member 20 there are formed recesses 24 and 25 which communicate with the groove 21 and have pivoted therein drill stem grips 26 and 27. These grips are pivotally mounted on pivots 28 and 29 respectively and are eccentrically shaped, that is, the radius from the centers of their respective pivots gradually increases upwardly. The eccentric peripheral surfaces on these grips have upwardly directed teeth, as clearly shown in Figure 3. Each grip has an outwardly extending arm, the arms being indicated at 30 and 31 respectively, which is disposed within its respective side or arm of the forked lever 17. Preferably the arms have hemispherical portions 32 which bear upon the bottoms of the slots 19.

The operation and advantages of the improved drill puller are as follows. When the drill D has become fast in the hole H, the drill stem embracing member 20 is first applied thereto and the plate 22 secured in place by means of screws 23. The base 10 is then

positioned near the hole and the forked lever 17 positioned thereon. The arms 30 and 31 are then positioned within the slots 19. When the upper end of the lever is moved downwardly it first swings the arms 30 and 31 upwardly, causing the grips 26 and 27 to first grip on the stem S. As soon as these grips engage the stem, continued lifting effort exerted by the lever on the arms causes the grips to lift the drill. The great mechanical advantage present is ordinarily sufficient to extricate the drill from the hole regardless of how fast or how tightly it may have become wedged. A single movement of the lever will, of course, only lift the drill a short distance, however, by reversing the movement of the lever, the arms 30 and 31 will be engaged by the upper sides of the slots 19 and will pivot slightly to disengage the drill. This permits the stem embracing member 20 and the grips to slide downwardly on the stem and a new grip taken on the drill and a successive lift.

In some instances the drill is almost completely within the hole. On the conventional drill there is ordinarily a squared head 33 near which there is a shoulder 34. In order to take care of such conditions the forward side of the stem embracing member 20 has a recess 35 formed thereon near the bottom of groove 21. The plate 22 likewise has a recess 36. These recesses cooperate to receive the shoulder 34 and although the head 33 may be too short to be gripped by the toothed surfaces on the grips, it will extend upwardly a sufficient distance to form an abutment for the grips to enable the drill stem embracing member 20 to be lifted by the arms 30 and 31.

From the above described construction it will be appreciated that a novel, simple and advantageous drill puller is provided which is of relatively simple yet durable construction. A great mechanical advantage is present and the design is such as to insure the establishment of a good grip on the drill stem during the pulling.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A drill puller comprising a base, a forked lever fulcrumed upon the base, a drill stem embracing member having a vertical groove adapted to receive a drill stem, eccentrically shaped toothed drill stem grips pivotally mounted upon the drill stem embracing member, said grips having outwardly extending arms adapted to be lifted by the forked lever, said embracing member having a removable plate, the embracing member and plate having recesses formed thereon beneath the grips adapted to receive the shoulder on the conventional rock drill.

2. A drill puller comprising a base, a forked lever having trunnions on the arms of the fork pivoted upon the base, a drill stem embracing member having a groove adapted to receive a drill stem, and eccentrically shaped toothed drill stem grips pivotally mounted upon the drill stem embracing member, said grips having outwardly extending arms adapted to be lifted by the forked lever.

3. A drill puller comprising a base, a forked lever fulcrumed on the base, a drill stem embracing member having a groove adapted to receive a drill stem, eccentrically shaped toothed drill stem grips pivotally mounted upon the drill stem embracing member, each arm of the fork being slotted, said grips having arms extending into the slots of the arms of the lever so as to be capable of being lifted thereby.

In testimony whereof I have signed my name to this specification.

MICHAEL J. WOZNACK.