J. F. McDOWELL.

SAFETY DEVICE FOR WELLS.

APPLICATION FILED APR. 26, 1920.

1,370,140. **Patented Mar. 1, 1921.**

FIG. 1.

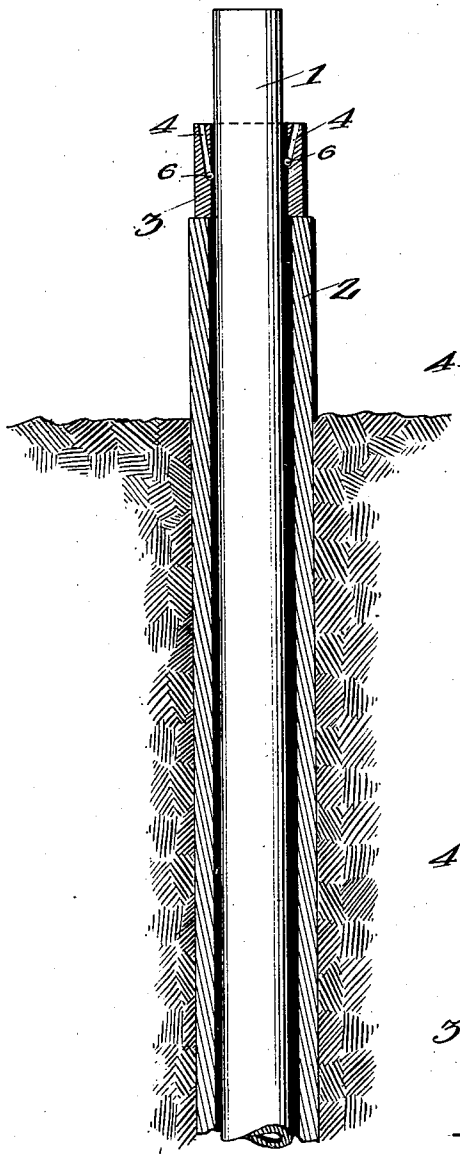
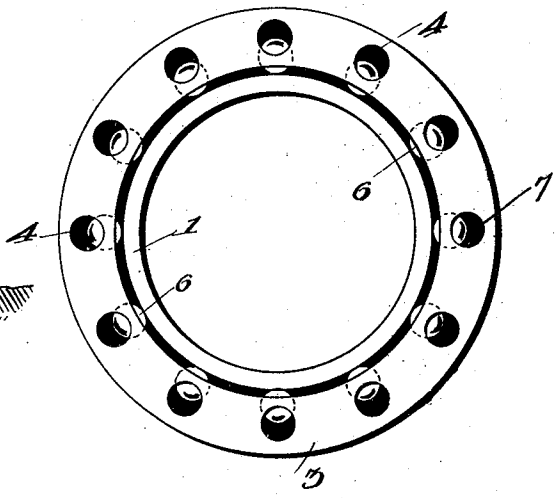


FIG. 2.



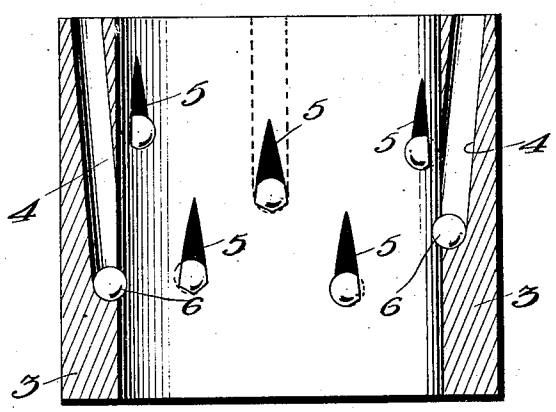


FIG. 3.

WITNESSES

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SAFETY DEVICE FOR WELLS.

1,370,140. Specification of Letters Patent. Patented Mar. 1, 1921.

Application filed April 26, 1920. Serial No. 376,698.

To all whom it may concern:

Be it known that I, JOHN FRANK McDOWELL, a citizen of the United States, and a resident of Shreveport, in the parish of Caddo and State of Louisiana, have invented certain new and useful Improvements in Safety Devices for Wells, of which the following is a specification.

My invention is an improvement in safety devices for wells, and has for its object to provide a device of the character specified which may be arranged at the top of the well casing, about the drill stem or other tools, for preventing downward movement of the said tools or drill stem during the raising thereof, the said means being in the form of a collar through which the stem passes and having means for gripping the stem when it moves downwardly and for releasing the stem when it moves upwardly.

In the drawings:

Figure 1 is a sectional view of a portion of a well casing, with the safety device in place;

Fig. 2 is a top plan view of the device;

Fig. 3 is a vertical section.

The present embodiment of the invention is shown in connection with a drill stem 1 arranged in the well casing 2, and the improvement comprises a sleeve or collar 3 of suitable thickness and of a diameter such that it will permit the passage of the stem 1 but will not enter the well casing 2.

In use, the collar rests upon the top of the casing, with the stem passing through the same. This collar has a series of vertical recesses 4, which extend from the top downwardly and inwardly in the thickness of the wall of the collar, and the said recesses cut through the inner face of the wall of the collar near their lower ends, the lower ends of the said recesses opening into the bore of the collar, as clearly shown in Fig. 3.

The opening 5 at the lower end of each recess will be substantially triangular, as shown in Fig. 3, the largest end of the opening being downward, and because of the inclined arrangement of the recesses 4 the depth of the opening 5 will decrease toward the wide ends of the said openings, that is, the openings 5 will be shallower at their lower ends than at their tops.

A ball 6 is arranged in the recess 4, each of the balls being of a diameter such that it will fit smoothly in the recess and will move freely therein. The openings 5 are of a size such that the balls will not pass through the said openings, while at the same time they are of sufficient size to permit a considerable portion of the ball to extend into the bore of the collar. The upper ends of the recesses 4 are closed in any suitable manner, as, for instance, by plugs indicated at 7, and these plugs may be held in the recesses in any suitable or desired manner, as, for instance, by threading, soldering or the like. Since the recesses are always vertical, no particular holding means is required for the balls.

In operation, the collar, as before stated, is placed on the top of the well with the drill stem or tools passing through the collar. In practice, some means will be provided for simultaneously raising the balls, so that they may be held out of engaging position during the operation of the drill. It will be obvious that when the balls are not held out of engaging position, that is, when they rest in the bottoms of the recesses 4, they will grip the stem 1 and will prevent downward movement thereof. The weight of the stem tends to tighten the balls and to tighten the collar on the stem. When the stem is moved upwardly the balls are released and permit the free upward movement of the stem. Referring to Fig. 3, it will be seen that the recesses 4 open at different levels in the collar. Some of these recesses open near the lower end and others near the top, while others open at various distances intermediate the ends.

I claim:

1. A device of the character specified comprising a collar of an internal diameter to receive a drill stem and of an external diameter to prevent movement into the well casing, said collar having means for gripping the stem when it moves in one direction and released by the movement of the stem in the other direction, said means comprising balls, the collar having recesses extending longitudinally in the walls thereof and opening at their lower ends into the bore of the collar, balls in the recesses, the openings into the bore of the collar being of a size to prevent the complete passage of the balls but to permit a considerable portion of the ball to extend into the bore of the collar.

2. A device of the character specified,

comprising a collar of an internal diameter to receive the stem, and of an external diameter to prevent movement of the collar into a well casing, the collar having openings extending longitudinally thereof, from its upper edge inclining inwardly to open into the lumen intermediate the ends thereof, said openings into the lumen of the collar being at various depths, and bolts in the opening of a size to prevent their passage through the openings but to cause them to extend into the lumen of the collar.

JOHN FRANK McDOWELL.