Sept. 8, 1925. 1,552,675

W. E. BRUCE

VALVE LATCH FOR BAILERS

Filed Nov. 27, 1922

Fig. 1.

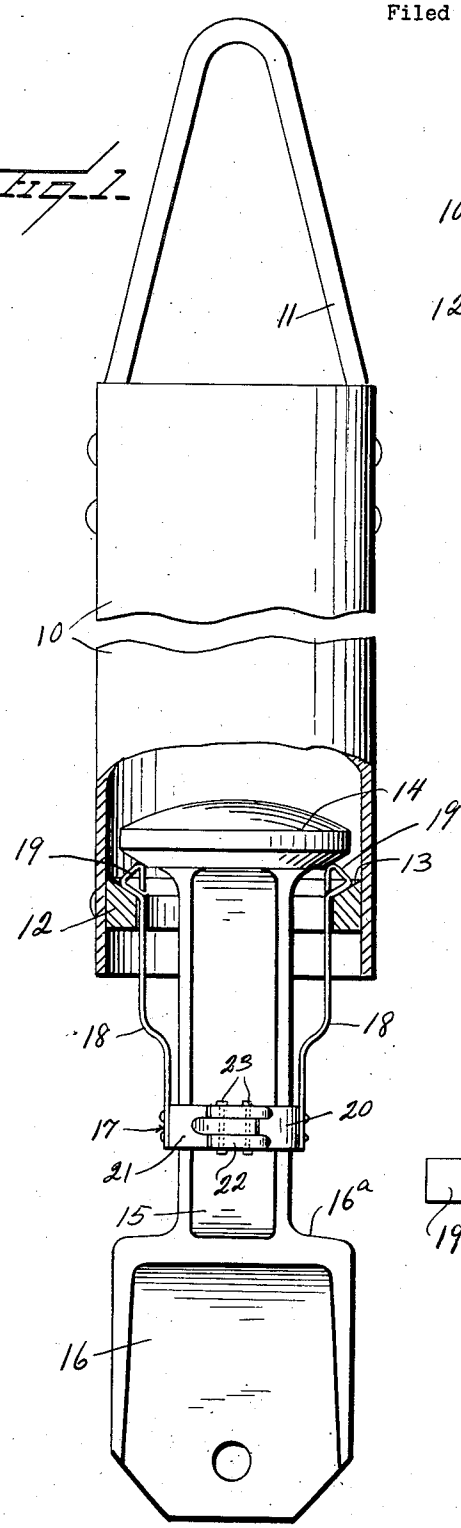


Fig. 2.

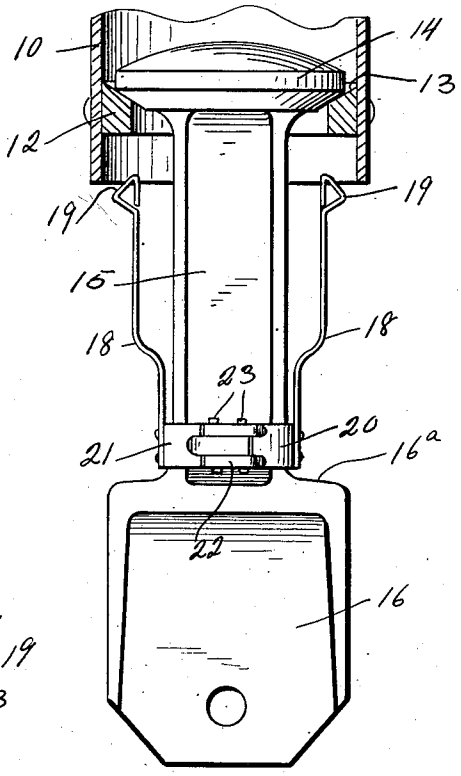
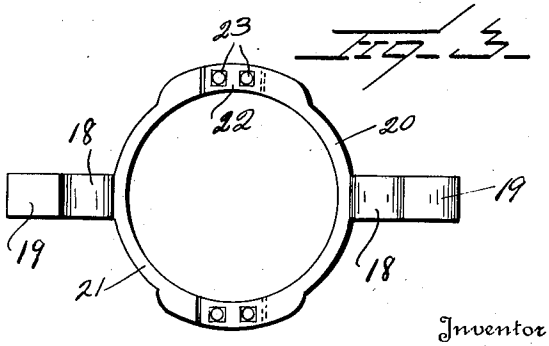


Fig. 3.



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UNITED STATES PATENT OFFICE.

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VALVE LATCH FOR BAILERS.

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To all whom it may concern:

Be it known that I, WILLIAM E. BRUCE, a citizen of the United States, residing at Yukon, in the county of Canadian and State of Oklahoma, have invented certain new and useful Improvements in Valve Latches for Bailers, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to bailers commonly known in the art of well drilling as slush buckets or sand bailers.

Oftentimes in drilling wells it is necessary to drill the well dry, that is to keep the walls of the well dry while drilling to prevent the walls from caving in, while at the same time the bottom of the well where the drilling is going on is under water. Under these circumstances water must be lowered into the well without being discharged against the walls thereof and discharged into the bottom of the well.

The general object of the invention is to provide an attachment for sand bailers whereby the bailer may be converted into a bucket by which water may be lowered into a well and automatically discharged when the bailer or bucket has reached the bottom of the well.

A further object of the invention is to provide an attachment adapted to be applied to the shank of the dart valve of an ordinary bailer, which attachment is so formed that when the dart strikes the bottom of the well the valve will be lifted and the attachment will hold the valve lifted and prevent it from returning to its seating position.

Another object is to so construct the attachment that it may be readily applied to and will fit upon the shank of the dart valve of any ordinary slush bucket commonly found upon the market.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is an elevation of a bailer and its valve, the lower portion of the valve being broken away, my attachment being shown as applied to the valve shank and as holding the valve open;

Figure 2 is a like view to Figure 1 but only showing the lower portion of the bailer and showing the valve in its closed position;

Figure 3 is an enlarged bottom plan view of the ring 20 and the arms 18.

Referring to these drawings, 10 designates an ordinary bailer or slush bucket having the usual bail 11 at its upper end. The lower end of this slush bucket is open and fitted with a valve seat 12 having an upwardly inclined face 13. Coacting with this face of the valve seat 12 is a downwardly closing valve 14 of the usual type having a downwardly extending shank 15 carrying a dart 16 at its lower end. All of these parts are of any ordinary or suitable construction and I do not wish to be limited to the particular details shown. I have illustrated the bailer or slush bucket as commonly used by all drillers.

My attachment comprises a sectional ring, designated generally 17, which loosely embraces the shank 15 and is slidable thereon and to which ring is attached the two upwardly extending, resilient arms 18. The upper ends of these arms are formed to provide protuberant portions 19 adapted, when the arms are in the position shown in Figure 1, to rest upon the valve seat 12 and to rest against the end face of the valve 14 and hold the valve 14 in spaced relation to the face 13 of the valve seat so as to permit any liquid contained within the slush bucket or bailer to run out. The ring 17 loosely embraces the shank 15 so that it can slide up and down thereon. While I do not wish to be limited to the exact form of this ring, it is obvious that the ring will have to be sectional in order to place it upon the shank and that preferably means will be provided so as to permit the ring to be adjusted to suit shanks of different diameters or cross sectional areas. I have illustrated a ring formed in two sections 20 and 21, these sections having interlocking tongues 22 having sliding engagement with each other so that the tongues may be adjusted one tongue between two other tongues. These tongues are held in adjusted position by transverse bolts 23.

It is obvious that this construction permits the two sections 20 and 21 to be adjusted so as to increase or decrease the diameter of the ring to cause it to fit loosely upon any shank. Preferably the arms 18 are formed of resilient strips riveted or otherwise connected to the ring 17, these strips being outwardly bent midway of their ends, then extending upwardly and again

being bent outwardly, then upwardly and then downwardly so as to form the protuberant portions 19. The upper and lower faces of these protuberant portions are inclined so that the upper face of the protuberant portion will, when the attachment is lifted, bear against the lower corner of the valve seat and be forced inward and slip by the valve seat and then expand outward so as to rest upon the face 13 of the valve seat.

In the use of this device, the bailer or slush bucket is filled with water which forces the valve 14 against its seat in an obvious manner, (see Figure 2) and then the bailer or bucket is lowered into the well. As soon as the dart 16 strikes the bottom of the well it moves upward, lifting the valve, and when it has moved upward to a sufficient extent the shoulders 16^a formed at the junction of the dart and the shank strike the ring and the ring then moves upward with the dart and shank until the protuberant portions 19 have slipped by the seat and into the position shown in Figure 1. If now the bucket be slightly raised, the valve will be held from lowering to its seat and water will run out between the valve and the seat. Obviously the greater the downward pressure of the valve dart, the tighter the latches or arms 18 will hold, thereby making it impossible for the device not to operate properly.

It will be seen that the device is formed of two duplicate parts easily and quickly put on or taken off and adjusted to fit any size slush bucket or dart. The cost of making this "valve gag" will be very slight and a device of this kind is absolutely necessary where it is desired to drill with a dry hole, as it is termed in the art.

In ordinary practice the valve latches will be put on the market with the arms 18 not outwardly bent but extending straight and parallel to each other and afterwards these arms will be bent by the operator to suit the particular construction or size of the slush bucket with which the device is to be used.

Of course, it will be understood that in drilling a well "with a dry hole" a certain amount of water from 20′ to 30′ in depth is required at the lower end of the well. This is the least amount which will permit the drill to operate. This water is deeper than the length of the slush bucket and, therefore, an ordinary slush bucket could not be used for the purpose of filling the well to this depth with water, as it is obvious that the ordinary slush bucket would be inoperative for this purpose after the water was of a depth greater than that of the slush bucket. The usual depth of hole that can be made with one run of the drill in dry drilling is from 4′ to 6′. Then the drill is taken out and the mud or slush taken entirely out and clean water put in at every run of the drill. My device permits one slush bucket to be used either as a slush bucket for taking out the mud and slush after one run of the drill or by applying my attachment to the slush bucket as a means for lowering water into the well and filling the lower portion of the well up to a depth of 20′ or 30′ with clean water for the next run of the drill.

I claim:—

1. The combination with a bailer having a downwardly closing valve at its lower end and a seat against which the valve rests, the valve having a downwardly extending shank normally projected below the bailer, of means adjustably mounted upon and carried by the shank and moving upward with the shank adapted to engage, when moved upward, against the upper face of the seat, to hold the valve in spaced relation to the seat.

2. The combination with a bailer having a valve seat at its lower end, a valve normally resting on said seat and having a shank extending below the bailer and through the seat, the shank terminating at its lower end in a dart, of means for preventing the closing of the valve when once lifted from its seat comprising a member encircling the shank but movable upward with the shank and having upwardly extending arms formed at their upper ends to engage the valve seat and hold the valve open.

3. The combination with a bailer having a valve seat at its lower end, a valve normally resting against said seat and having a downwardly extending shank and a dart, of means for holding the valve open when once lifted comprising a ring loosely encircling the shank above the dart and having a plurality of upwardly extending, resilient arms, the upper ends of the arms being formed with outwardly protuberant portions having inclined upper faces, the upward movement of the dart, shank and valve consequent upon the dart striking the ground causing the protuberant portions to strike the valve seat and pass the same and then lock over the face of the valve seat.

4. An attachment of the character described comprising a member adapted to loosely encircle the shank of a bailer valve and having a plurality of upwardly extending, resilient arms, the upper ends of said arms being formed with outwardly protuberant portions, the upper faces of said protuberant portions being downwardly and outwardly beveled.

5. An attachment for bailer buckets having a valve seat and a valve formed with a shank and dart, of an attachment for holding the valve off the valve seat when the shank and dart have been once raised com-

prising a sectional ring adapted to loosely embrace the shank of the valve and dart, the sections being adjustable, said ring having a pair of upwardly extending, resilient arms, the upper ends of said arms being outwardly and upwardly bent, then inwardly and upwardly bent, and then downwardly bent, said terminal portions of the arms being adapted to pass through the valve seat and snap over the upper face thereof and hold the valve raised from the seat.

6. The combination with a bailer having a downwardly closing valve at its lower end and a seat against which the valve rests, the valve having a downwardly extending shank normally projected below the bailer, of a resilient member extending upward parallel to the shank and mounted upon the shank at its lower end for upward movement with the shank, said resilient member at its upper end being formed to engage with the upper face of the seat and support the valve in spaced relation to the seat, the upper end of the resilient member being movable inward against the resilience of the member to permit its passage past the valve seat.

7. The combination with a dart valve and its seat, of spring members carried on opposite sides of the dart, and normally extending outwardly therefrom, and tapered heads carried by said spring members having outwardly extending shoulders at their bottom adapted to extend over and engage the valve seat to hold the valve out of engagement therewith.

In testimony whereof I hereunto affix my signature.

WILLIAM E. BRUCE.