Sept. 17, 1940. G. S. SHUPE 2,215,164

PUMP

Filed March 30, 1939

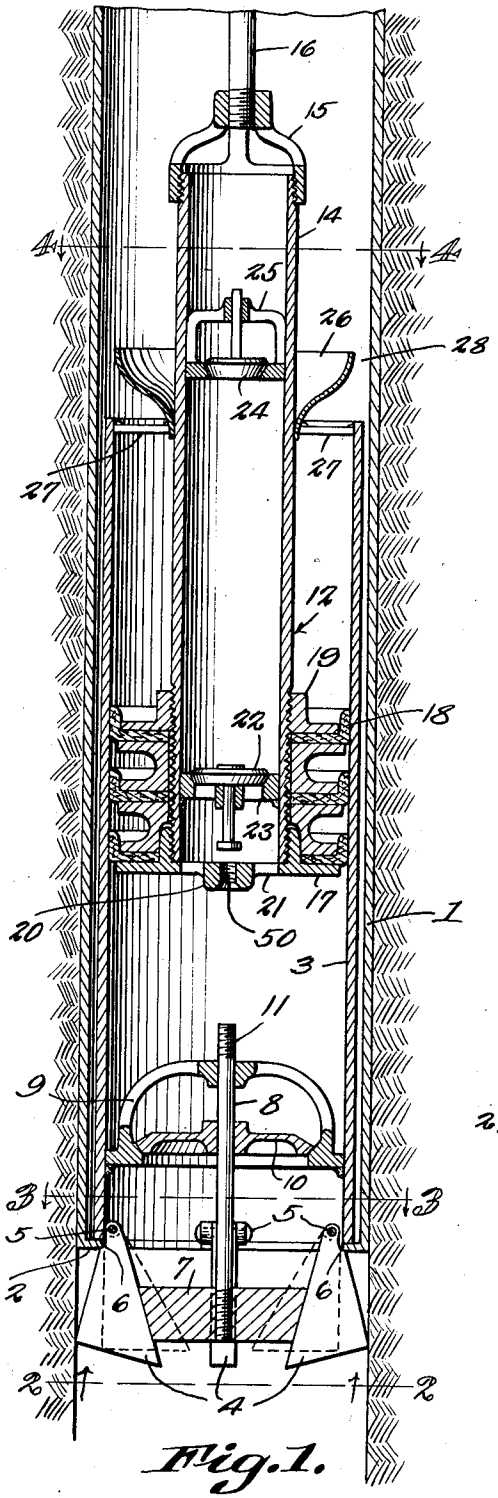


Fig. 1.

Fig. 2.

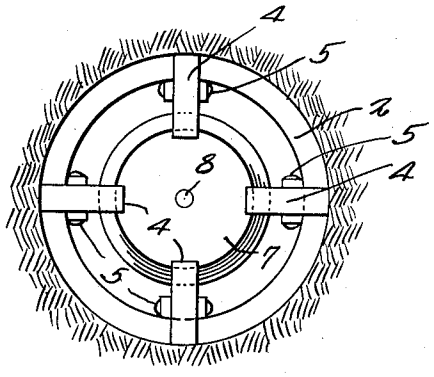


Fig. 3.

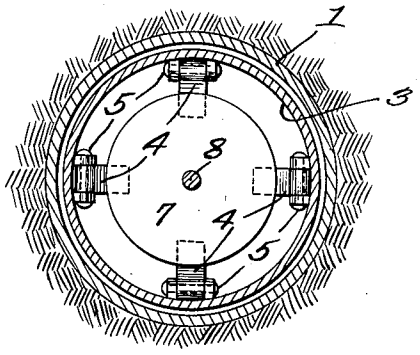
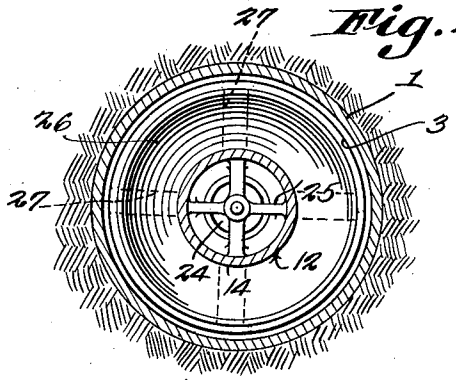


Fig. 4.



Greek S. Shupe
INVENTOR.

BY C. A. Snow & Co.

ATTORNEYS.

Patented Sept. 17, 1940 2,215,164

UNITED STATES PATENT OFFICE

2,215,164

PUMP

Greek S. Shupe, Fort Stockton, Tex.

Application March 30, 1939, Serial No. 265,023

3 Claims. (Cl. 103—181)

One object of the present invention is to provide a novel pump construction, another object of the invention is to supply novel means for preventing loose objects from dropping into a pump cylinder, and another object of the invention is to provide novel means whereby the pump cylinder and associated parts may be lowered readily into a well casing, locked in the well casing, and removed from the well casing.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawing:

Fig. 1 is a longitudinal section showing a device constructed in accordance with the invention;

Figs. 2, 3 and 4 are cross sections taken, respectively, on the lines 2—2, 3—3 and 4—4 of Fig. 1.

The numeral 1 marks a well casing, provided at its lower end with an inwardly extended annular keeper 2, supporting a pump cylinder 3, approximately triangular latches 4 being pivotally mounted at 5 within the lower end of the cylinder 3, for lateral and radial swinging movement, the latches being provided near their upper ends and on their outer edges with inset seats 6, the latches being held engaged with the keeper 2 by a frusto-conical disk 7, constituting a wedge, engaging the inclined inner edges of the latches, the combined wedge and weight 7 being secured to the lower end of a stem 8 mounted for vertical reciprocation in a foot valve cage 9, secured within the lower part of the cylinder 3, a downwardly closing check valve 10 being mounted for vertical reciprocation on the stem 8, and being adapted to seat on the valve cage 9, the upper end of the stem 8 projecting above the cage 9, and being threaded as shown at 11.

A piston, denoted generally by the numeral 12 is mounted for reciprocation with respect to the cylinder 3 and includes a tubular body 14 joined at its upper end by an open connection 15 to a sucker rod 16 or other operating means. An abutment disk 17 is threaded on the lower end of the body 14 of the piston 12, within the cylinder 3. Packings 18 are disposed about the piston body 14, in slidable contact with the bore of the cylinder 3, the packings being compacted between the abutment disk 17 and a jam nut 19 threaded on the piston body 14.

Transversely spaced radial arms 21 connect a thickened hub 20 with the disk 17, the hub having a threaded opening 50 for cooperation with the threaded end 11 of the stem 8. In the lower part of the piston body 14 is secured a seat 23, and a downwardly closing lower valve 22 is slidably carried by, and cooperates with the seat 23. In the upper part of the piston body 14 is secured a cage 25, a downwardly closing upper valve 24 being slidably carried by the cage, and being adapted to close downwardly and seat on the cage.

The piston body 14 reciprocates in a downwardly tapered receiver 26, which is secured to the upper end portion of the cylinder 3 by spaced radial arms 27. At its upper end, the receiver 26 is approximately of the same diameter as the cylinder 3, and trash or detached parts which might otherwise find their way down into the cylinder 3, and effect a scoring of it, are caught by the receiver 26. There is a liberal space 28 between the widest part of the receiver 26 and the cylinder 3.

In order to remove the cylinder 3, the piston 12 is lowered by means of the sucker rod 16, and turned, until the threaded upper end 11 of the stem 8 is engaged in the threaded hole 50 in the hub 20 of the abutment disk 17 on the piston 14. An upward pull is exerted on the rod 16, and the stem 8 and the wedge 7 are raised, the wedge or disk 7 moving out of contact with the latches 4. The cylinder 3 now can be raised in the well casing 1, and can be pulled out of the well, the part 7 moving upwardly until it comes into contact with the cage 9. The latches 4 are swung inwardly by contact with the part 2. By a reversal of the operation last above described, the cylinder 3 can be lowered into the well, the parts resuming the positions depicted in Fig. 1.

On the upstroke, the valves 24 and 22 are closed. The valve 10 opens, and the piston head 18—19—17 pulls liquid into the space below the said piston head structure. On the down-stroke, the foot valve 10 closes, the valves 24 and 22 open, the water or other liquid is forced upwardly through the tubular piston body 14 and overflows into the upper part of the cylinder 3, above the piston head structure 18—19—17. On the next up-

stroke, the valves 22 and 24 close, and the piston head 18—19—17, moving upwardly in the cylinder 3, boosts the water out of the upper end of the well casing 1.

Having thus described the invention, what is claimed is:

1. In a pump, a casing, a cylinder removably mounted in the casing, latches pivoted to the cylinder and engaged with the casing, the latches being movable inwardly, out of engagement with the casing, a latch-operator movable to a lowered position in which it holds the latches in engagement with the casing, thereby to retain the cylinder in the casing, a cylinder-carried abutment which the latch-operator engages, when it is raised sufficiently, a piston mounted to reciprocate in the cylinder, and interengaging elements on the piston and on the latch-operator, whereby the latch-operator may be raised, first independently of the cylinder, to disengage the latch-operator from the latches, and then to bring the latch-operator into engagement with the abutment, to bring about an upward removal of the cylinder.

2. In a pump, a casing, a cylinder removably mounted in the casing, casing-engaging latches pivoted to the cylinder, a foot valve cage secured to the cylinder, a latch-operator movable to a lowered position, in which it holds the latches engaged with the casing, thereby to retain the cylinder in the casing, a stem carrying the latch-operator, the stem being slidably mounted in the foot valve cage, a foot valve slidable on the stem and mounted to seat on the foot valve cage, a piston mounted to reciprocate in the cylinder, and interengaging elements on the piston and on the stem, whereby the latch-operator may be raised, first independently of the cylinder, to disengage the latch-operator from the latches, and then to bring the latch-operator into engagement with the foot valve cage, thereby to effect an upward removal of the cylinder.

3. In a pump, a casing, a cylinder removably mounted in the casing, casing-engaging latches pivoted to the cylinder, a latch-operator movable to a lowered position in which it holds the latches engaged with the casing, thereby to retain the cylinder in the casing, and means under the control of a workman for moving the latch-operator to and from operative position.

GREEK S. SHUPE.