

DOUBLE ACTING PUMP.
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DOUBLE-ACTING PUMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOSEPH M. OUGH, of Oakland, Alameda county, State of California, and WILLIAM E. HUBBARD, of the city and county of San Francisco, State of California, both citizens of the United States, have invented new and useful Improvements in Double-Acting Pumps, of which the following is a specification.

This invention relates to pumps, and particularly to double acting well pumps.

The object of the present invention is to provide a compact, double acting well pump, involving a plunger carrying a plurality of discharge valves; and to provide a pump involving structural features permitting the ready withdrawal of the pump cylinder barrel and its associated parts bodily from the casing or drop pipe of the well; and particularly to design the supporting members upon which the pump barrel temporarily rests so as to prevent the two members from becoming so interlocked as to prevent their ready removal.

This invention consists of the parts and the combination and construction of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a central vertical section through the pump. Fig. 2 is a cross section on line *x—x*, Fig. 1.

In the present embodiment of our invention 1 represents a plunger rod head or coupling with a clamping or guard nut 2, and 3 represents a thimble or barrel holder internally threaded to receive the complementary end of a well casing or drop pipe A.

The barrel holder 3 is provided with an internally tapered seat portion having a bead or shoulder 4^a, upon which may be supported the complementary, conical and upwardly flared portion of a barrel head 5, which is provided at its exterior with suitable ports 5^a, allowing the inflow of fluid in the well into the interior of a cylinder barrel 34, to be hereinafter described. There is also formed upon the barrel head 5, a packing gland 4 whereby suitable packing devices 6 and 8 may be properly adjusted to bear upon a tubular reciprocating extension or tubular plunger rod 25, connected to the plunger head 1.

The barrel head 5 is provided with a centrally contracted sleeve portion upon which

is reciprocally mounted a suitable valve 10, here shown as in the shape of a disk, perforated centrally to pass over the sleeve portion of the barrel head 5. The valve 10 is normally lifted by an expansive spring 15, supported upon a removable spring guard 17 attached to the threaded end of the barrel head 5, to seat against the lower end or face of the barrel head 5 and to prevent the escape of water or fluid within the barrel 34 when a piston 19 secured to the lower end of the reciprocating plunger rod 25, is lifted. This piston 19 is provided with suitable ingress ports at its upper and lower ends for the admission of fluid to its interior and a suitable means for rendering the operation of the piston 19 within the barrel 34 water tight is shown as comprising a pair of oppositely disposed cup-shaped washers or gaskets 26, held in position on the lower end of the reciprocating piston 19 by means of a ring 33 secured to the piston by suitable screws 28.

Preferably, the reciprocating piston 19, mounted on the lower end of the plunger rod 25, is adapted to have a snug working fit with the interior of the barrel 34, and is provided with a ported valve guard 22 upon the lower portion of which is movable a disk valve 12, normally depressed by an expansive spring 21 re-acting at its upper end against a similar disk valve 11 mounted upon the valve guard 22.

In operation, when the plunger rod 25 moves downwardly in the barrel 34 it forces downwardly the cylinder or piston 19, and the upper discharge valve 11 will automatically close against the upper interior wall of the piston 19 causing a vacuum in that portion of the barrel 33 above the piston 19 and drawing in a charge of water through the barrel holder 5. The descent of the piston 19 causes the valve 12 to be lifted against the tension of its spring 21 and a volume of water which is retained in the lower portion of the barrel 34 underneath the end of the piston 19 will pass to the interior of the piston 19.

To prevent the downward escape of fluid from the lower portion of the barrel 34, there is provided at its lower end a barrel end 32 which is ported to allow the inflow of fluid beneath a downwardly closing valve 13 normally closed by the tension of an expansive spring 30 surrounding a valve

guide 29. When the plunger rod 25 and its connected piston 19 moves upwardly, the vacuum caused in the lower portion of the barrel 34 lifts the valve 13 and allows fluid 5 to flow into that portion of the barrel 34. At the instant of the upward stroke of the piston 19 the valves 12 and 10 automatically close and the volume of fluid contained in the piston 19 and above the valve 12 passes 10 through the ported valve guide 22 and into the tubular plunger rod 25. At the same time the fluid contained in the upper portion of the barrel 34 and beneath the valve 10 will depress the valve 11 against the tension of its spring 21 and a further quantity 15 of fluid will flow into the interior of the piston 19. Thus it will be seen that at each reciprocation of the piston 19 a quantity of fluid will pass into the interior of the piston 20 and through the ported valve guide 22 thence being discharged through the tubular plunger rod 25.

An important feature of the present invention is the provision of the tapered complementary seating members 3 and 5; the member 5 being provided with an external under-cut flange 5^b adapted to seat snugly upon the bead 4^a of the barrel holder 3. By thus imposing the load of the barrel upon 30 the inter-engaging flange and bead portions the liability of the two seating members 3 and 5 becoming immovably bound, as will sometimes occur, is greatly reduced. This particular detail also relieves the tapered seating surfaces of a great deal of

pressure, so that when it becomes necessary to lift the barrel holder 5 from its seat, this can be readily accomplished since there is little or no friction existing between the two members, as nearly all of the load is imposed 40 upon the bead 4^a.

Having thus described our invention, what we claim and desire to secure by Letters Patent is—

An improved double acting pump having 45 in combination, a drop pipe, a barrel, an outwardly flared head secured to the upper end of the barrel, said head having an external, annular, undercut flange overhanging the exterior wall of the barrel, a barrel holder 50 attached to the lower end of the drop-pipe, an inwardly tapered seat on said holder to receive said head, said holder having an internally projecting bead around its upper end to engage under the externally project- 55 ing flange of the barrel holder and thereby support the barrel, a central sleeve on the barrel holder, and a plunger working in said sleeve whereby when the plunger is pulled from the well the barrel and its holder may 60 be drawn up through the drop-pipe.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JOSEPH M. OUGH.
WILLIAM E. HUBBARD.

Witnesses:

STANLEY J. BELL,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."