

W. A. CAMPBELL.
PUMP FOR DEEP WELLS.
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1,043,568.

Patented Nov. 5, 1912.

Fig. 1.

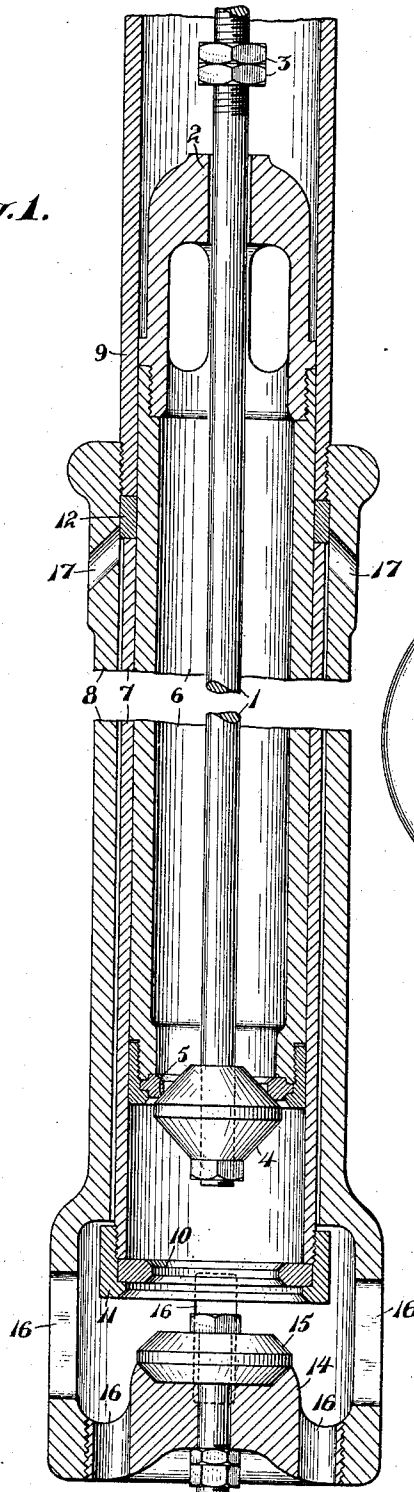
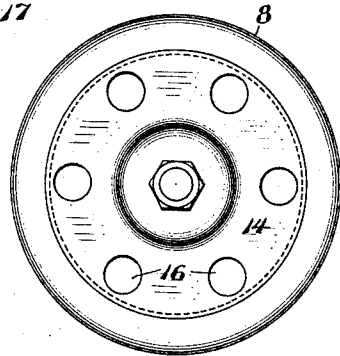


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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PUMP FOR DEEP WELLS.

1,043,568.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM A. CAMPBELL, a citizen of the United States, residing at Maricopa, in the county of Kern and State of California, have invented new and useful Improvements in Pumps for Deep Wells, of which the following is a specification.

The object of the present invention is to provide an improved form of pump especially adapted for deep oil and other wells, which will be simple in construction, in which the parts liable to be worn out can be easily replaced, and in which the working parts will not be liable to stick on account of magnetic attraction.

In the accompanying drawing, Figure 1 is a broken vertical section of my improved apparatus; Fig. 2 is a bottom plan view thereof.

Referring to the drawing, 1 indicates a valve rod, which reciprocates in the upper end of a bearing 2, and above said bearing carries adjustably secured thereon lock nuts 3, to determine the extent of movement of a valve 4, carried on the lower end of said valve rod. Said valve rod 4 seats at its upper side against a seat 5, secured to the lower end of a hollow plunger 6, the upper end of which is screwed to said bearing 2. Thus, on the downward stroke of the valve rod, the valve 4 leaves its seat 5 and allows liquid to enter said plunger, and on the upper stroke of said rod the valve fits tightly upon its seat and lifts the liquid with it.

Surrounding the plunger 6 with a close working fit is a barrel 7, which has a loose fit in an outer casing 8, said outer casing being screwed at the top to a well casing 9. By reason of said close fit, the plunger 6 in its vertical reciprocation tends to reciprocate also the barrel 7. To the bottom of the barrel a brass, steel or bronze seat 10 is secured by a sleeve 11 screwed to the lower end of the barrel, and above the barrel there is a brass or bronze ring 12 loosely fitted in the casing 8, which ring, in its upper position, abuts against the lower end of the well casing 9. The main casing is enlarged internally at the lower portion, and in its lower end is screwed a support 14 in which is bolted a seat 15, which is adapted to engage the seat 10 carried by the lower end of the barrel 7, which seat 15 thus acts as a standing valve. Said support 14 and casing

8 is formed with apertures 16 to permit the liquid to enter. By removing the support the barrel can be taken out whenever necessary. As will be seen, the movement of the barrel is comparatively small, about three-fourths of an inch, it being limited in its downward movement by the abutment of the seat 10 with the seat 15, and in its upward movement by the abutment of the ring 12 with the lower end of the casing 9. Also the motion of the pump rod relative to the plunger is small, being limited at the lower end by the abutment of the valve 4 with the seat 5, and at the upper end by the abutment of the bearing 2 with the lower lock nut 3. The reciprocation of the plunger 3 is whatever is required, ordinarily 18 or 20 inches. The main casing is formed with holes 17, just below its union with the well casing, to let out sand or other material which might work up between the barrel and the casing.

It is to be observed that, whereas, in prior devices, the main casing is the working barrel, and it is therefore subject to much wear through use, and when worn must be removed and the plunger with it, in my invention the said casing is not worn by use and it is never discarded except when broken by accident. Furthermore, in my invention, the plunger and barrel can be made of standard thicknesses, and, when the plunger is worn, it can be turned down to a standard size and a new barrel of standard size can be used therewith, this operation being capable of being repeated several times, in each case the pump being thus rendered as good as new.

By forming the sleeve 12 and the seat 10 of brass, steel or bronze, the result is avoided, which otherwise sometimes occurs when these parts are made of iron, that the barrel is held by magnetization against movement.

From the foregoing description, the operation of the pump will be readily understood. The drawing shows the plunger beginning its upward stroke, the valve being closed, and the barrel up against the brass ring 12, and open at the bottom from the seat 15. At the beginning of the downward movement of the pump rod, first, the rod moves down through the bearing 2 until the lower lock nut 3 strikes the top of said bearing. The barrel begins to move downward,

the valve still being open at the bottom, until the seat of the lower end of the barrel rests upon the seat 10, which thus answers the same purpose as the standing valve in common use in other pumps, but at far less cost and with more certainty in its operation. On the downward movement of the plunger the liquid is forced up into the plunger, and upon the upward movement of the pump rod the valve 4 is closed and the liquid is carried up therewith.

I claim:

1. The combination of a casing, a barrel therein, the lower ends of the barrel and casing being provided with means engaging each other to prevent the passage of liquid into the barrel when the barrel is in its lower position, said casing and barrel being formed to permit the entrance of liquid into the barrel when in its upper position, and the casing being provided with means for limiting the upward movement of the barrel, the casing having holes therethrough above the lower end of the barrel to permit the discharge of sand between said barrel and casing, a hollow plunger reciprocating vertically with a tight fit in said barrel, a pump rod within the plunger, a valve adapted to contact with the lower end of the plunger to prevent the entrance of liquid thereinto, and means on said pump rod and plunger adapted to engage each other to

limit the downward movement of the pump rod with reference to the plunger, substantially as described.

2. The combination of a casing, a barrel therein, the lower ends of the barrel and casing being provided with means engaging each other to prevent the passage of liquid into the barrel when the barrel is in its lower position, said casing and barrel being formed to permit the entrance of liquid into the barrel when in its upper position, and the casing being provided with means for limiting the upward movement of the barrel, a hollow plunger reciprocating vertically with a tight fit in said barrel, a pump rod within the plunger, a valve adapted to contact with the lower end of the plunger to prevent the entrance of liquid thereinto, means on said pump rod and plunger adapted to engage each other to limit the downward movement of the pump rod with reference to the plunger, and limiting devices of non-magnetic metal arranged adjacent to the top and bottom of said barrel, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. CAMPBELL.

Witnesses:

JESSIE B. WOOTTON,
GRACE M. GARFIELD.