

D. W. HUDSON.
DEEP WELL PUMPING APPARATUS.
APPLICATION FILED JULY 1, 1912.

1,041,796.

Patented Oct. 22, 1912.

Fig. 1.

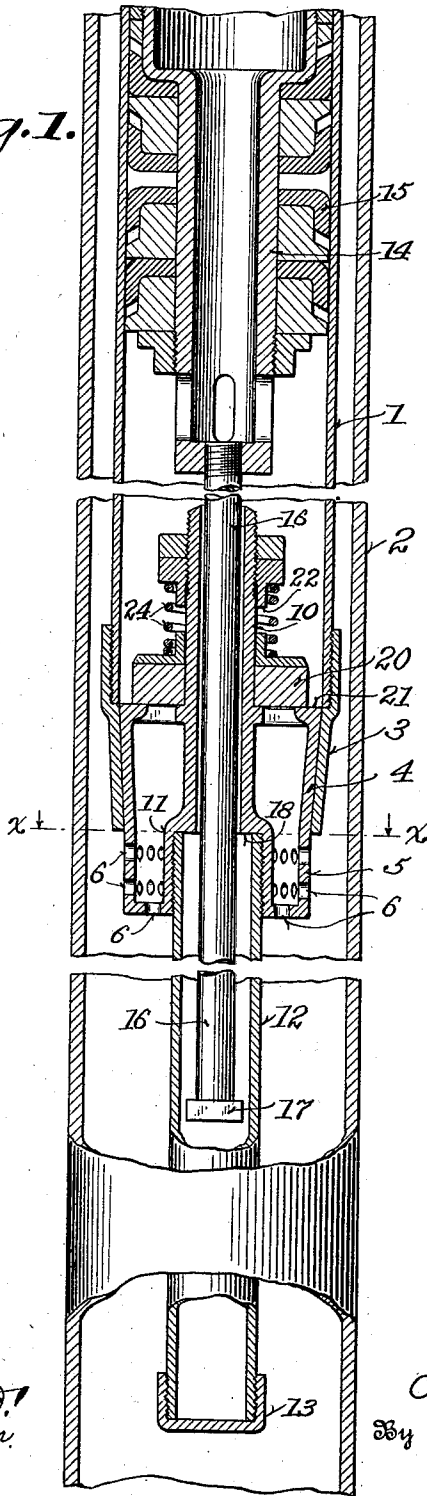


Fig. 2.

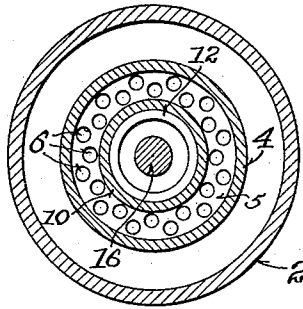
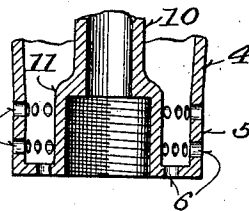


Fig. 3.



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DEEP-WELL-PUMPING APPARATUS.

1,041,796.

Specification of Letters Patent.

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Application filed July 1, 1912. Serial No. 706,862.

To all whom it may concern:

Be it known that I, DAVID W. HUDSON, a citizen of the United States, residing at Green Bay, county of Brown, and State of Wisconsin, have invented new and useful Improvements in Deep-Well-Pumping Apparatus, of which the following is a specification.

My invention relates to improvements in deep well pumping apparatus, with especial reference to that class of pumping outfits in which the lower inlet valve may be removed from the pump cylinder with the piston rod and piston. In pumps of this type, the piston is loosely connected to a movable valve seat for the lower valve in such a manner that the piston may reciprocate in ordinary pumping operations without affecting the lower valve or its seat until the piston is drawn upwardly beyond its normal field of movement. The sliding connections ordinarily employed between the piston and the seat of the lower valve have been usually interposed between the lower valve and the piston in such a manner as to require a greatly increased length of pump cylinder in order to allow for the play of these interposed connections. If the piston in such a pump has a normal three foot stroke, it is necessary to provide a cylinder at least six feet long, since the lower valve seat must have an upwardly projecting member equal in length to that of the piston movement, and said member must of course be located below the field of piston movement. Attempts have also been made to pass a connecting rod through a stuffing box in the lower valve or its seat, but this has not been found to be practical, it being impossible to keep such a stuffing box properly packed and the use of a stuffing box resulting in considerable loss of power on account of friction.

The object of my invention is to provide a form of construction in which a piston may be provided with a connecting rod for the lower valve and its seat, which will extend through the lower valve without permitting leakage and which will not require a stuffing box.

A further object of my invention is to provide an improved inlet check valve and seat for the lower end of a deep well pump cylinder.

In the drawings—Figure 1 is a vertical sectional view of a portion of a pump tube and pump apparatus therein embodying my invention. Fig. 2 is a sectional view drawn on line *x—x* of Fig. 1. Fig. 3 is a detail view in vertical section, of the lower end of the valve seat member.

Like parts are identified by the same reference characters throughout the several views.

The pump cylinder 1 is suspended in the well tubing 2 and is provided at its lower end with a tapered member 3, in which a conically tapered valve seat member 4 is adapted to fit, as clearly shown in Fig. 1. The lower end portion 5 of the valve seat member 4 is preferably cup shaped and provided with apertures 6, through which water may pass, this portion of the member 4 being adapted to serve as a strainer. A tubular member 10 extends upwardly from the bottom of the member 4 into the pump cylinder 1. This tubular member 10 may be formed integrally with the member 4 or detachably connected therewith, if desired. It is enlarged at 11 near its lower end and a tube 12 is screwed into this enlarged end. A cap 13 closes the bottom end of this tube. The piston rod 14, which may be tubular in form, extends through the piston 15 and at its lower end is provided with a depending rod 16, which extends downwardly through the member 10 into the member 12, and is provided with a head 17, adapted to engage against an internal shoulder 18 of the member 10, when the piston rod and piston are raised above their normal limit of upward movement. When the head 17 engages the shoulder 18, a continued upward movement of the piston rod and its depending rod 16 will lift member 4 from its seat in the member 3 and withdraw it through the pump cylinder. 20 is a valve, loosely mounted upon the member 10 and adapted to close upon the valve seat at 21. 22 are stop collars on the member 10, adapted to limit the upward movement of the valve 20, and 24 is a coiled spring for seating the valve 20.

With the above described construction, a comparatively small rod 16 may be employed, which adds but little to the weight of the piston and piston rod. The rod 16 does not fill the member 10, water being al-

lowed to circulate freely from the space above the valve 20 through the member 10 and into the tubular extension 12.

I claim—

- 5 1. The combination with a pump cylinder, of a valve seat member removably connected with the lower end portion of said cylinder and provided with ports for the passage of water therethrough, a tubular member extending through said valve seat member, a cap at its lower end, an interior shoulder on said tubular member, a piston rod provided with an extension adapted to slide in said tubular member and provided with
10 a head at its lower end adapted to engage said shoulder when the piston rod is moved upwardly beyond its normal field of movement, and a valve adapted to slide upon the tubular member to open and close the ports
15 in the valve seat member.

- 20 2. The combination with a pump cylinder, of a valve seat member removably connected with the lower end portion of said cylinder and provided with ports for the pas-

sage of water therethrough, a tubular member extending through said valve seat member, a cap at its lower end, an interior shoulder on said tubular member, a piston rod provided with an extension adapted to slide in said tubular member and provided
25 with a head at its lower end adapted to engage said shoulder when the piston rod is moved upwardly beyond its normal field of movement, and a valve adapted to slide
30 upon the tubular member to open and close the ports in the valve seat member, said valve seat member having a cup shaped lower end provided with a series of apertures and constituting a strainer through
35 which water is permitted to pass into the cylinder when the valve is open.

In testimony whereof I affix my signature in the presence of two witnesses.

DAVID W. HUDSON.

Witnesses.

A. L. CANNARD,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."