Mar. 13, 1923.

1,448,018

G. E. WILLERS

DEEP WELL PUMP

Filed Sept. 9, 1921

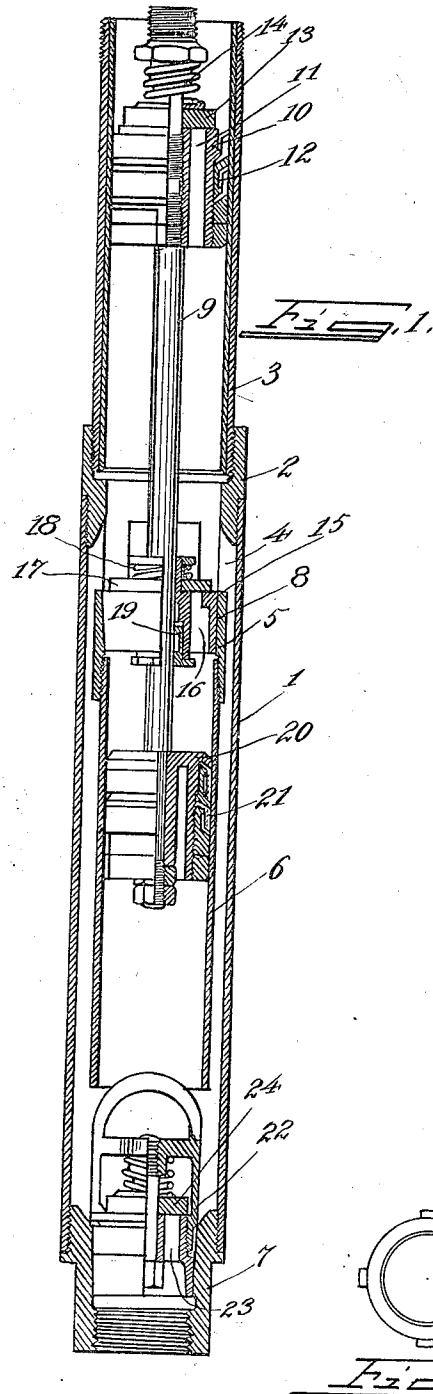


Fig. 1.

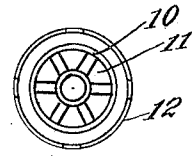


Fig. 2.

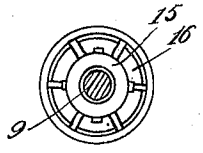


Fig. 3.

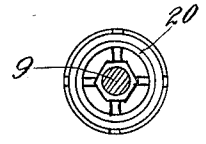


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE E. WILLERS, OF LAWRENCEBURG, INDIANA, ASSIGNOR TO A. D. COOK, INC., OF LAWRENCEBURG, INDIANA, A CORPORATION.

DEEP-WELL PUMP.

Application filed September 9, 1921. Serial No. 499,423.

To all whom it may concern:

Be it known that I, GEORGE E. WILLERS, a citizen of the United States, and a resident of Lawrenceburg, in the county of Dearborn and State of Indiana, have invented certain new and useful Improvements in Deep-Well Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to deep well pumps of the double acting type, wherein there are two cylinders or barrels and two plungers, and the plunger in the lower barrel forces water around the said barrel into the upper barrel, thereby gaining a double action with small friction.

I am aware that pumps of this character have been long produced, and it is to the bringing together of the most practical and effective combination of plungers, valves and relief valves that my invention is addressed.

In the lower cylinder of a double plunger pump of the deep well type, it is customary to use a piston or plunger which has no valve therein, and one of the main objects of my invention is to provide for an effective method of taking care of the leakage of water past the lower plunger which will not detract from the pulling force of the lower plunger.

The above objects I accomplish by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings,

Figure 1 is a central longitudinal section through the pump device, same being sectioned through one half of the valves and plungers.

Figure 2 is a top plan view of the upper plunger body.

Figure 3 is a bottom plan view of the relief valve body for the lower barrel or cylinder.

Figure 4 is a plan view of the lower plunger body.

Figure 5 is a bottom plan view of the foot valve seat.

The device has a casing 1 of tubular shape into which is set a union 2 having internal threads for an upper barrel or cylinder 3, and external threads by means of which it is held in the casing.

This union has a plurality of ribs 4, which connect it integrally with an annulus 5, there being space between the ribs for a flow of water through the casing into the upper barrel or cylinder.

Threaded into internal threads at the lower end of this union is the lower barrel or cylinder 6, which terminates short of the lower end of the casing.

In the lower end of the casing is threaded in place a tapered seat ring 7 for the foot valve. The annulus 5 has also a tapered seat 8 for the relief valve for the lower cylinder.

Extending into the upper barrel through a well casing (not shown) is the pump rod 9. On the rod in the upper cylinder is a plunger or piston having a body 10 through which are ports 11, and the outside of which is provided with suitable cup leathers 12. A valve 13, held down by a spring 14, closes the ports at the upper end.

The relief valve has a body 15 which makes a driving fit with the annulus on the central union, and ports 16 closed by a valve 17. This valve is held down by a spring 18, and the body has a central orifice packed as at 19 by suitable material.

The pump rod has on its lower end a closed plunger having a body 20 and cup leathers 21, and forming a driving fit into the seat ring at the foot of the casing is a valve body 22 having ports 23 and a valve 24.

The upper barrel is larger than the lower barrel so that the various valves and plungers can be inserted from the upper end of the device.

As so constructed the device operates as follows: Upon raising of the pump rod, the upper plunger or piston forces water upwardly out of the device, sucking at the same time, while the lower plunger sucks water into the lower barrel. The thrusting down of the rod fills the upper cylinder with water through the plunger valve, and the lower plunger forces water out through the base of the barrel and up into the casing and through the ports in the union.

When there is any leakage past the lower plunger, it forces the liquid out in its up-

ward stroke, thereby giving a force to the upper plunger and avoiding the blocking of the lower plunger.

This relief valve does not weaken the work of the plunger in the lower barrel in its ascending stroke as would a valve in the plunger, and the niceties of spring tension in the relief valve are not important since it would never operate except in a manner to assist in the pumping action instead of hindering it.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A pump having aligned barrels and operatively connected plungers therein, the one plunger valved and the other without valves, a relief valve at the end of the valveless plunger barrel adjacent the other barrel, and ports from the lower end of the valveless barrel to the other barrel.

2. A pump having a casing, a barrel mounted in one end therof, another barrel within the casing and spaced therefrom, ports from the casing into the first mentioned barrel, and a relief valve closing the second noted barrel adjacent the one end of the casing, and said second barrel opening directly into the casing at its lower end, a foot valve in the casing, a pump rod, a valved plunger in the barrel first mentioned and coupled to said rod, and a valveless plunger in the second noted barrel coupled to said plunger.

GEORGE E. WILLERS.