

No. 614,172.

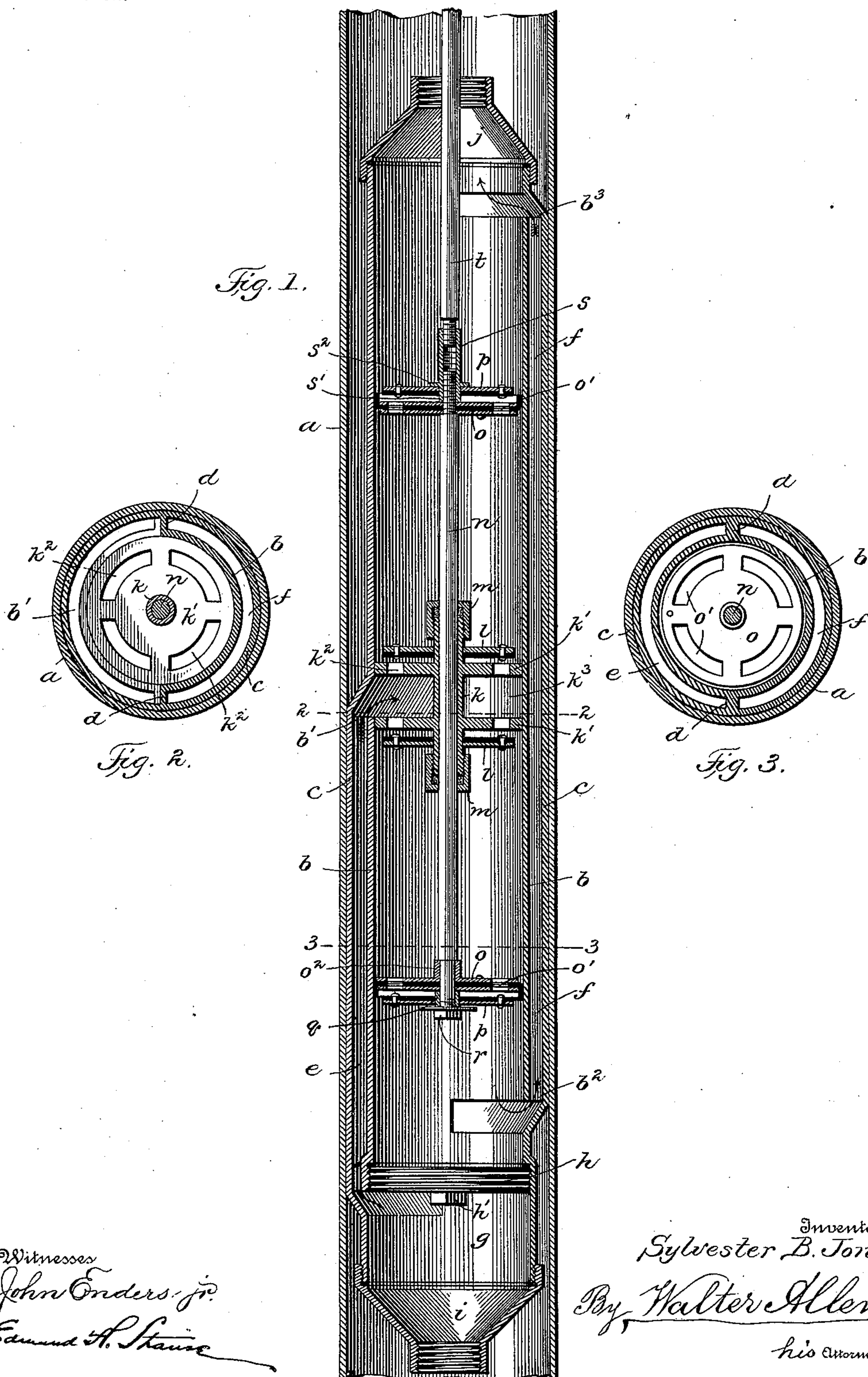
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S. B. JONES.

DOUBLE ACTING LIFT AND FORCE PUMP FOR ARTESIAN WELLS.

(Application filed May 25, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

SYLVESTER B. JONES, OF ASHVILLE, NEW YORK.

DOUBLE-ACTING LIFT AND FORCE PUMP FOR ARTESIAN WELLS.

SPECIFICATION forming part of Letters Patent No. 614,172, dated November 15, 1898.

Application filed May 25, 1897. Serial No. 638,132. (No model.)

To all whom it may concern:

Be it known that I, SYLVESTER B. JONES, a citizen of the United States, and a resident of Ashville, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Double-Acting Lift and Force Pumps for Artesian Wells, of which the following is a specification.

My invention is an improvement on those double-acting lift and force pumps for Artesian wells in which a double piston is employed.

My improvement consists in novel features of construction, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved double-acting lift and force pump for Artesian wells. Fig. 2 is a horizontal section on the line 2 2, Fig. 1, looking downwardly. Fig. 3 is a horizontal section on the line 3 3, Fig. 1, looking downwardly.

a represents a portion of the well-tube of an Artesian well with which my pump may be used.

The casing of my pump comprises two shells, an inner shell *b* and an outer shell *c*. The inner shell *b* provides a central chamber divided by a valve-head into lower and upper cylinders and is formed with an inlet-port *b'* near to the middle portion of the central chamber, with an outlet-port *b²* at the lower end thereof and with an inlet-port *b³* at the upper end of the chamber. The outer shell *c* is so arranged with relation to the inner shell as to leave between the shells a space which is divided by vertical partitions *d* into two semi-annular passages *e f*.

e is the inlet-passage, which leads from the chamber *g* at the base of the casing to the inlet-port *b'*, while *f* is the outlet-passage, which leads from the outlet-port *b²* at the lower end of the chamber to the inlet-passage *b³* at the top of the chamber. The lower end of the inner shell is sealed by a screw-head *h*, having an angular projection *h'*, which provides means whereby upon the application of a suitable key the screw-head may be removed and replaced when desired.

i is the lower cap of the casing, with which the lower portion of the pump-tube is coupled, and *j* is the upper cap of the casing, with which the upper portion of the pump-tube is connected.

Located at the middle portion of the central chamber is my improved valve-head. It is constructed with a sleeve *k* for the piston-rod, formed in one piece with lower and upper valve-seats *k'*, having suitable ports *k²*, and with an annular chamber *k³*, with which the inlet-port *b'* communicates, and it surrounds the sleeve between the valve-seats.

Sliding loosely on the sleeve on opposite sides of the valve-head are lower and upper valves *l*, which are limited in their movement by suitable stops secured to the sleeve. These stops may be in the form of stuffing-boxes *m*, secured to the projecting ends of the sleeve for packing the piston-rod.

n is a piston-rod working freely through the sleeve. It is provided with lower and upper pistons, each comprising a valve-seat *o*, having suitable ports *o'* and fixed to the piston-rod, and a valve *p*, loosely sliding on the piston-rod, the lower piston-valve being located beneath its valve-seat and the upper piston-valve being located above its valve-seat. The lower end of the piston-rod is reduced in diameter to receive the collar *o²* of the lower piston-valve seat and a bushing *q*, on which the lower piston-valve slides, the lower piston-valve being limited in its downward movement by a lower stop or nut *r*. The upper end of the piston-rod is also reduced in diameter to receive the upper piston-valve seat and a rod-coupling *s*, having a bushing *s'*, on which the upper piston-valve slides, and an upper stop in the form of a collar *s²*, which limits the upward movement of the upper piston-valve.

The piston-valve seats each consist of a pair of plates having a leather washer held between them by suitable fastenings, and the sliding valves each consist of a plate having a leather facing secured thereto by suitable fastenings.

The direction in which the water is alternately lifted and forced is indicated by the arrows, and the operation of the pump will be readily understood. When the pump-rod is moved upwardly, the lower piston-valve is

opened, the lower head-valve is closed, the upper head-valve is opened, and upper piston-valve closed. When the pump-rod is moved downwardly, the lower piston-valve

5 is closed, the lower head-valve is opened, the upper head-valve is closed, and the upper piston-valve is opened. Thus the water is alternately lifted through the inlet-passage and forced through the outlet-passage.

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

1. A double-acting lift and force pump for Artesian wells comprising a casing formed

15 with lower and upper cylinders with an upper inlet-port, with a lower outlet-port, with a passage leading to the inlet-port, and with a passage leading from the outlet-port, the valve-head having a chamber in communica-

20 tion with the inlet-port and constructed with lower and upper valve-seats and with a sleeve, the lower and upper valves loosely mounted on the sleeve on opposite sides of the valve-

25 head, stops secured to the sleeve for limiting the movement of the head-valves, and the piston-rod working through the sleeve and provided with lower and upper pistons each having a valve-seat and a valve; substantially as described.

30 2. A double-acting lift and force pump for Artesian wells comprising a casing formed with lower and upper cylinders with an upper inlet-port, with a lower outlet-port, with a passage leading to the inlet-port, and with

35 a passage leading from the outlet-port, the valve-head having a chamber in communication with the inlet-port and constructed with lower and upper valve-seats and with a sleeve, the lower and upper valves loosely mounted

40 on the sleeve on opposite sides of the valve-head, stops secured to the sleeve for limiting the movement of the head-valves, the piston-rod working through the sleeve and provided with lower and upper stops, the lower piston

45 consisting of a valve-seat secured to the piston-rod and a valve loosely mounted on the piston-rod between the valve-seat and the lower stop, and the upper piston consisting

50 of a valve-seat secured to the piston-rod, and a valve loosely mounted on the valve-rod between the valve-seat and upper stop; substantially as described.

3. A double-acting lift and force pump for Artesian wells comprising a casing having an

inner shell providing lower and upper cylin- 55
ders, and formed with an upper inlet-port and with a lower outlet-port, and an outer shell surrounding the inner shell and so arranged with relation thereto as to leave a 60
space between the walls of the shells, the radial partitions dividing the said space so as to provide two semi-annular passages, one passage leading to the inlet-port and the other passage leading from the outlet-port, the 65
valve-head having a chamber in communication with the inlet-port and formed with upper and lower valve-seats and with a sleeve, the lower and upper valves loosely mounted on the sleeve on opposite sides of the valve- 70
head, stops secured to the sleeve for limiting the movement of the head-valves, and the piston-rod working through the sleeve and provided with lower and upper pistons each having a valve-seat and a valve; substantially as described. 75

4. A double-acting lift and force pump for Artesian wells comprising a casing having an inner shell providing lower and upper cylinders and formed with an upper inlet-port and with a lower outlet-port, and an outer shell 80
surrounding the inner shell and so arranged with relation thereto as to leave a space between the walls of the shells, the radial partitions dividing the said space so as to provide two semi-annular passages, one passage 85
leading to the inlet-port and the other passage leading from the outlet-port, the valve-head having a chamber in communication with the inlet-port and formed with upper and lower valve-seats and with a sleeve, the 90
lower and upper valves loosely mounted on the sleeve on opposite sides of the valve-head, stops secured to the sleeve for limiting the movement of the head-valves, and the piston-rod provided with lower and upper stops and 95
working through the sleeve, the lower piston consisting of a valve-seat secured to the piston-rod and a valve loosely mounted on the piston-rod between the valve-seat and the lower stop, and the upper piston consisting 100
of a valve-seat secured to the piston-rod and a valve loosely mounted on the piston-rod between the valve-seat and the upper stop; substantially as described.

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