

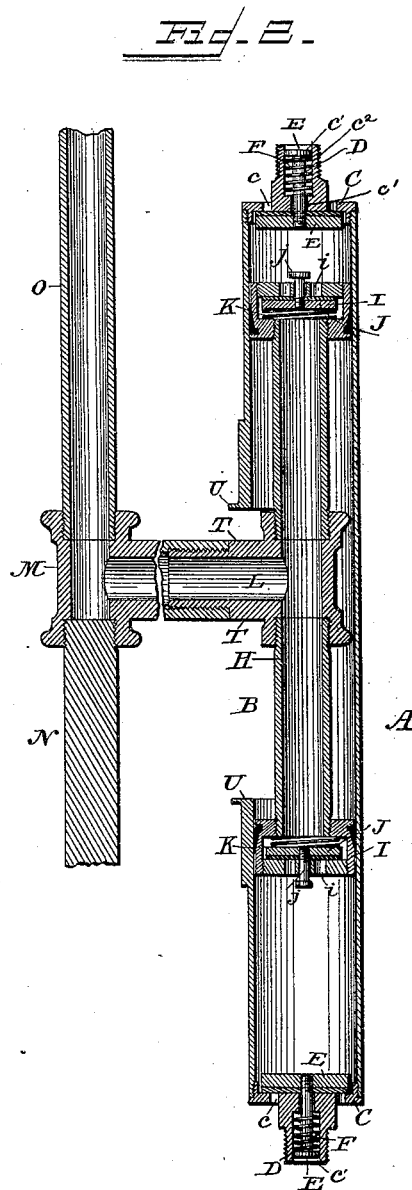
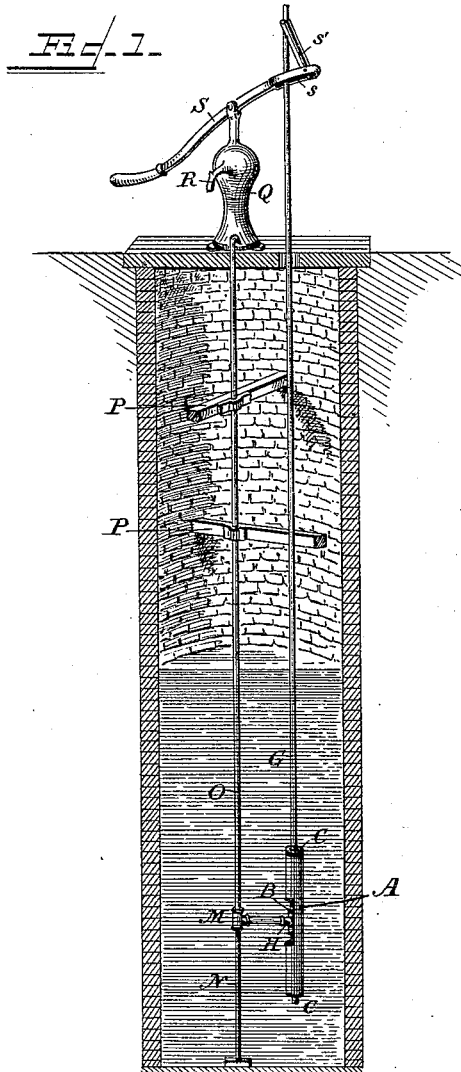
(No Model.)

2 Sheets—Sheet 1.

E. A. VAUGHAN.  
DOUBLE ACTING FORCE PUMP.

No. 492,699.

Patented Feb. 28, 1893.



Witnesses

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D. P. Melhaupt,

Inventor

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By his Attorneys,

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Fig. 3.

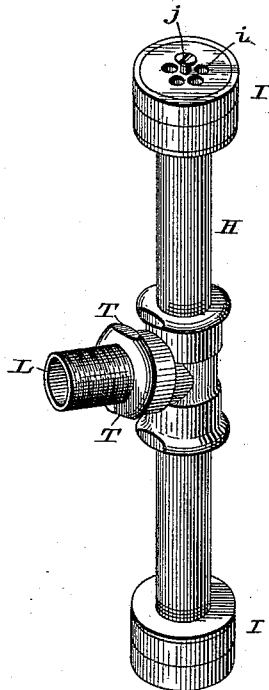


Fig. 4.

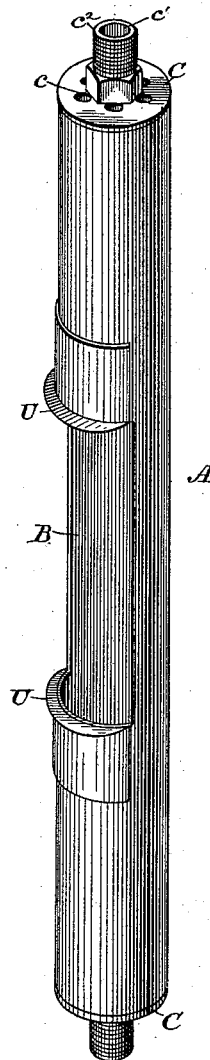
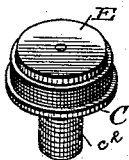


Fig. 5.



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# UNITED STATES PATENT OFFICE.

EDMUND A. VAUGHAN, OF CAMBRIDGE, ILLINOIS.

## DOUBLE-ACTING FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 492,699, dated February 28, 1893.

Application filed January 27, 1892. Serial No. 419,444. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND A. VAUGHAN, a citizen of the United States, residing at Cambridge, in the county of Henry and State of Illinois, have invented a new and useful Double-Acting Force-Pump, of which the following is a specification.

This invention relates to pumps, and more especially to double acting force pumps in which the water is forced in a continuous stream through the discharging pipe.

It is the primary object of this invention to provide a double acting pump which shall be comparatively simple in construction and at the same time will provide means for the easy manipulation of the pump, whereby a column of water may be easily and readily lifted and expelled from the discharge pipe under considerable force.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the construction combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings;—Figure 1 is a perspective view of a double acting pump constructed in accordance with my invention. Fig. 2 is a vertical longitudinal sectional view through the same and a portion of the stand pipe. Fig. 3 is a detail in perspective of the stationary hollow plunger. Fig. 4 is a similar view of the reciprocating pump barrel or cylinder. Fig. 5 is a similar view of one of the valve cylinder heads.

Referring to the accompanying drawings;—A represents a reciprocating cylinder or barrel of one continuous bore and provided with a single elongated opening or slot B located in one side thereof, and intermediate of the top and bottom of said cylinder. The upper and lower open ends of the cylinder A are interiorly screw threaded to receive the bottom and top valve and strainer disks C. Each of the said valve or strainer disks, or properly speaking cylinder heads C, is provided with a series of valve openings and strainer perforations *c*, and with the central perforation *c'* to receive the shanks D of the valves E, working under said heads and inwardly within the cylinder A. Balancing springs F are coiled

over the stems D and serve to normally hold said valves to their respective heads. It is of course understood that the said cylinder is to be submerged and worked beneath the water within the well. The upper head C is provided with an upwardly extending neck *c<sup>2</sup>* to which is connected the pump rod G operated in the manner to be presently described. The said cylinder is designed to inclose and work over the stationary hollow double plunger H. The said stationary hollow plunger H is exteriorly threaded at each end to removably receive the combined hollow plunger heads and valve chambers I, suitably secured to the hollow body of the plunger, and adapted to be worked in the upper and lower portions of the cylinder A above and below the side opening therein, as said cylinder is reciprocated thereover. The said hollow plunger heads are each threaded at both ends to engage the ends of the plunger and removably receive flat disk heads which are provided with a series of valve openings *i*, which are normally closed when the pump is not in operation by the circular valve disks J, working within said plunger heads or valve chambers, and mounted on the stems *j*, working through the disk heads. Suitable springs K also serve to balance said valves and hold them in position, both of which valves open inwardly with respect to the stationary plunger as will be readily seen. The said double hollow plunger is further provided with a T-coupling L, which receives the inner ends of the opposite connecting pipes forming the opposite portions of the plunger, and carrying the hollow plunger heads, said T-coupling L, also forming a single side or lateral discharge opening facing the elongated side opening or slot in the side of the pump barrel or cylinder. The coupling L receives the T-head or coupling M, which is designed to conduct the water from the stationary plunger. A solid supporting rod N is secured in the lowermost end of the T, M, and is designed to rest upon the bottom of the well in order to hold the said hollow plunger stationary and perfectly rigid, so that the cylinder may easily work thereover. A vertical stand pipe O is secured in the upper end of the T-head M, and extends above the curbing or

flooring of the well, the same being held firmly in position and stationary at suitable points of attachment by means of suitable supports and guides P conveniently located. The extreme upper end of the stand pipe terminates in an air chamber, Q, and has connected therewith the ordinary discharge spout R through which the forced water is forced.

The pump handle S is pivoted to the top of the air chamber Q, and is provided at one end with a slot s, through which the pump rod G passes, and is connected fixedly to the loop s', pivoted within said slot and extending above the same, thus providing an attachment whereby the pump rod is moved straight up and down in a vertical line as the handle is operated to work the reciprocating cylinder.

The side opening or slot of the pump barrel or cylinder A is of a sufficient length only to accommodate the up and down strokes of the reciprocating cylinder, the same (the opening) of course, being the length of the stroke plus the diameter of the, T, M. The said, T, M over which the sides of the opening B travel, is provided with flat strike faces, T, which at the end of each stroke are designed to strike against the out-turned stop flanges U extending out from the thickened top and bottom ends of said slot in order to limit the movement of the reciprocating cylinder accurately.

It will be noted that on account of the construction of the valved cylinder heads, the same provide not only for valved controlled inlets to the submerged cylinder, but also serve as strainers to keep the pump free from matters which might impede the operation of the same.

The construction of the whole pump provides not only for the collecting of a great volume of water, but as will be readily seen provides means whereby the same may be continually forced out of the discharge pipe

at considerable pressure. As the cylinder lowers over the stationary hollow plunger, the water standing between the top or upper head of said cylinder and the upper plunger head of said plunger is forced into the hollow plunger and out through the stand pipe, while the lower portion of the cylinder is filling. The upstroke of the cylinder forces the water in the bottom of the same out while the top is filling.

The construction, operation and many advantages of the herein described double acting pump are thought to be apparent without further description.

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

In a double acting pump, the combination of a vertically reciprocating cylinder made of a continuous single piece of metal and having at its ends removable heads carrying automatic valves, said cylinder being cut away at one side to form a single side opening and thickened at the upper and lower edges of said single side opening to form stop-flanges, a stationary double hollow plunger comprising a central T-coupling, and opposite connecting pipes connected at their inner ends to said T-coupling and carrying at their other ends valved plunger heads closely fitting the inner bore of the reciprocating cylinder, said T-coupling being provided with opposite flattened strike-faces adapted to be struck by the strike flanges of the cylinder, and a stationary discharge pipe coupling connected to the T-coupling of the plunger, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDMUND A. VAUGHAN.

Witnesses:

GEO. H. MCCLUNY,  
F. L. BRODD.