

(No Model.)

2 Sheets—Sheet 1.

D. WEBSTER.
DOUBLE ACTING PUMP.

No. 376,696.

Patented Jan. 17, 1888.

Fig. 1.

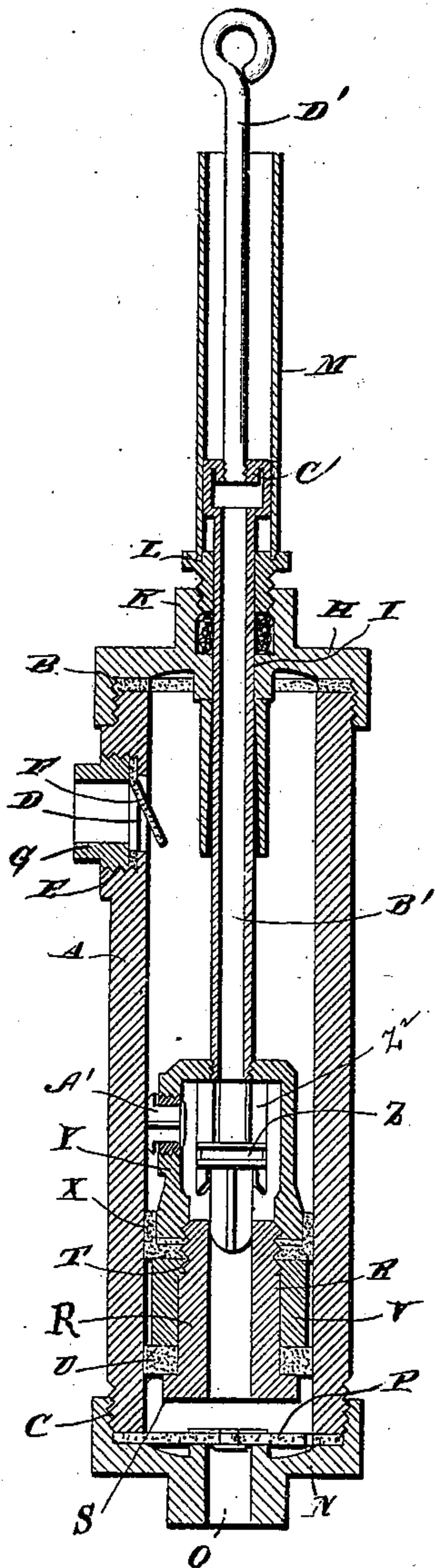
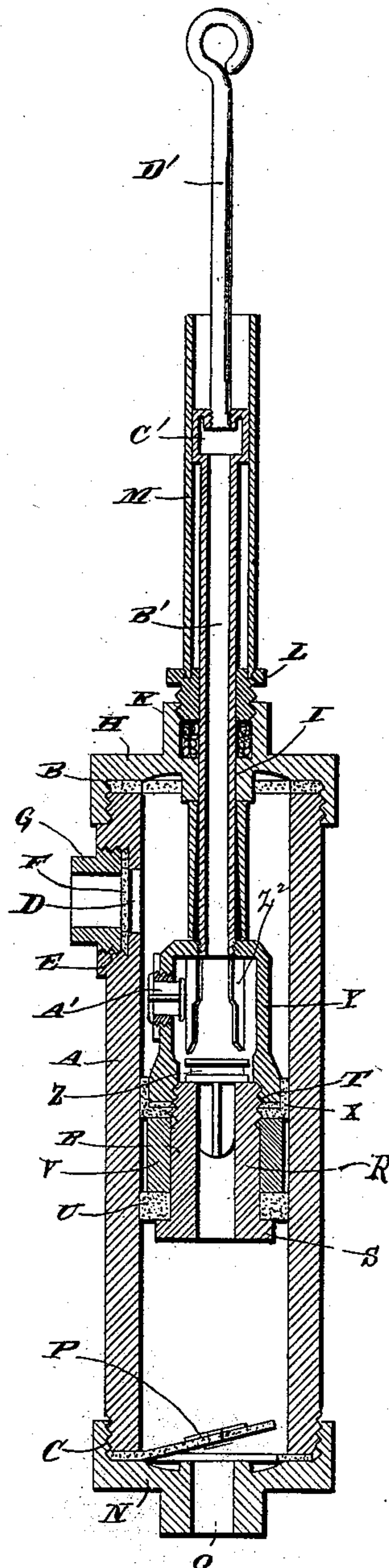


Fig. 2.



Witnesses

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J. W. Garner

Inventor

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By *his* Attorneys,

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Fig. 3

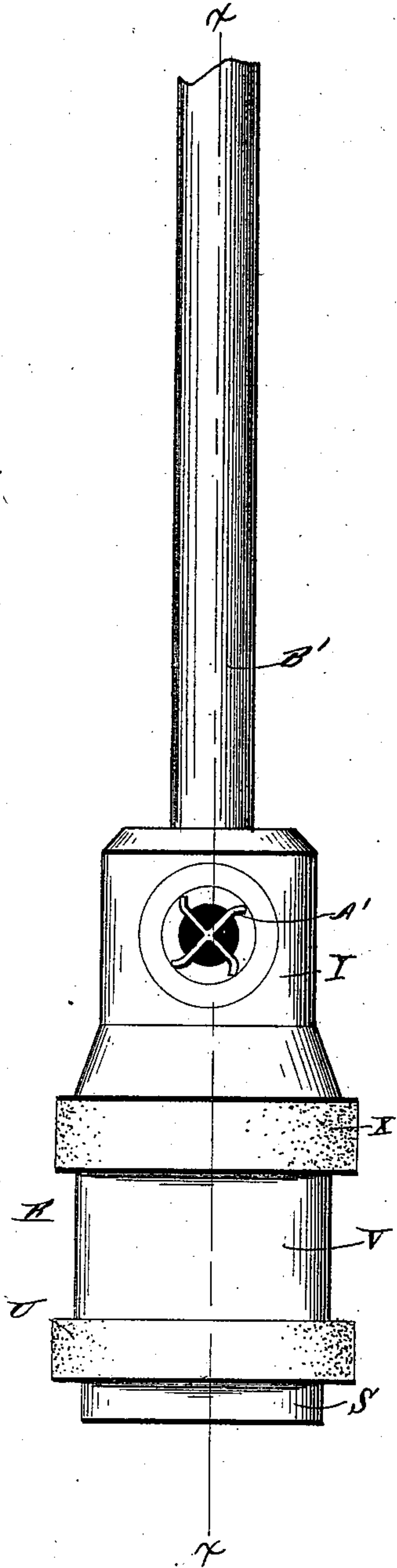
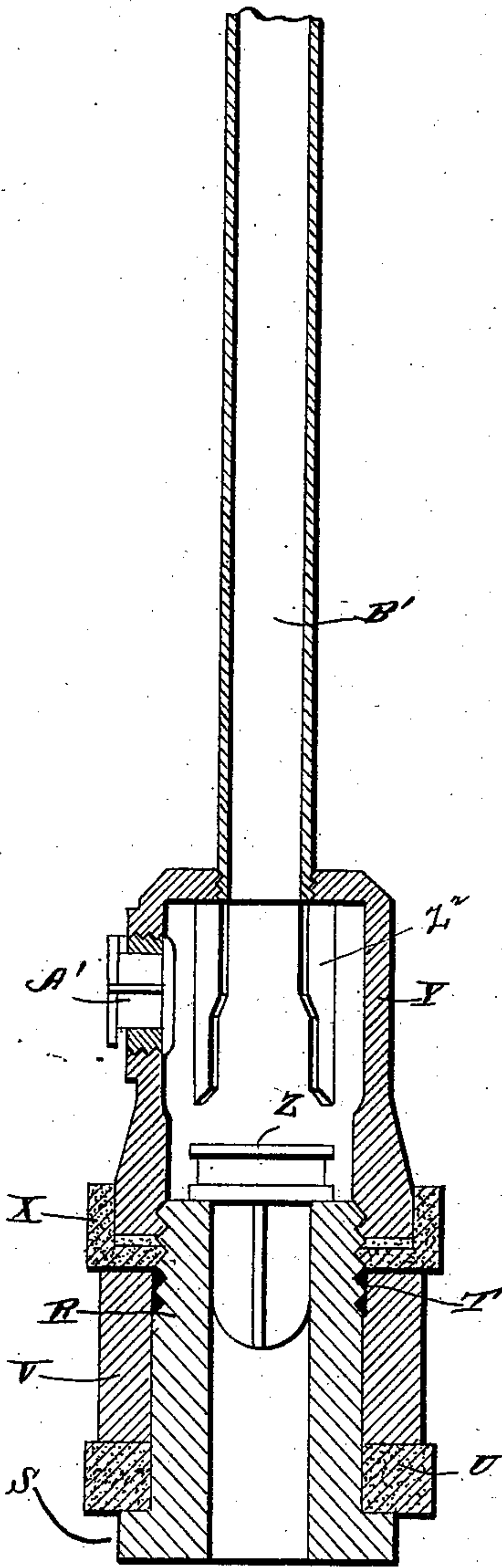


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

DANIEL WEBSTER, OF BROOKLYN, WISCONSIN.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 376,696, dated January 17, 1888.

Application filed March 23, 1887. Serial No. 232,156. (No model.)

To all whom it may concern:

Be it known that I, DANIEL WEBSTER, a citizen of the United States, residing at Brooklyn, in the county of Green and State of Wisconsin, have invented a new and useful Improvement in Double-Acting Pumps, of which the following is a specification.

My invention relates to an improvement in double-acting pumps; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claim.

The object of my invention is to provide a single-cylinder and single-piston pump which is adapted to raise water at each stroke of the piston in either direction, and this object I accomplish by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a pump embodying my improvements, showing the piston lowered. Fig. 2 is a similar view of the same, showing the piston raised. Fig. 3 is a detailed elevation of the piston. Fig. 4 is a vertical sectional view of the same, taken on the line *xx* of Fig. 3.

A represents the pump-cylinder, which is provided at its upper end with screw-threads B and at its lower end with screw-threads C. In one side of the cylinder, near the upper end thereof, is a countersunk opening, D, which extends through the side of the cylinder and is provided with the interior screw-threads, E.

F represents a clack-valve, which is seated in the shoulder formed at the inner end of the opening D and is adapted to open inwardly toward the interior of the cylinder.

G represents a hollow cylindrical sleeve, which is screwed into the opening D and bears against the outer side of the rim of the valve, and forms the valve-seat against which the valve closes. The said sleeve G is open both at its inner and at its outer ends.

H represents a cap which screws onto the upper end of the cylinder A to close the same. In the center of the said cap is made a vertical opening, I, and on the upper side of the cap, at the center thereof, is formed a packing-box, K.

L represents the gland, which is adapted to screw into the packing-box, and the upper side of the gland is provided with a threaded opening, to which is screwed the lower end of a delivery-pipe, M.

N represents a cap which is adapted to screw upon the lower end of the cylinder to close the same, and the said bottom cap, N, is provided with a vertical central opening, O, having an inwardly-opening clack-valve, P.

R represents a hollow cylindrical piston, which is arranged in the cylinder A, and is provided at its lower end with the enlarged disk S and has the screw-threads T at its upper end.

U represents a packing-ring, made of leather or other suitable material, which slips over the hollow piston and bears upon the upper side of the disk S and fits snugly against the inner side of the cylinder.

V represents a hollow cylindrical sleeve, which fits over the piston and bears upon the upper side of the packing-ring U. A packing-ring, X, is slipped over the upper end of the piston and bears upon the upper side of the sleeve V.

Y represents a hollow case or cage, which is screwed to the upper end of the piston and bears upon the upper side of the packing-ring X. In the lower side of the cage is a puppet-valve, Z, which is seated on the upper end of the piston and is adapted to close the same. Arms Z^2 are provided to limit the movement of the valve. In one side of the case or cage is an inwardly-opening puppet-valve, A'.

B' represents a hollow piston rod or tube, the lower end of which is screwed to the upper end of the case or cage and communicates with the interior thereof. The upper end of the said hollow piston rod or tube extends upward through the opening I in the top cylinder-cap and through the packing-box and gland, and enters the delivery-pipe M and is arranged concentrically therein, the said hollow piston rod or tube being of smaller diameter than the delivery-pipe. The upper end of the piston rod or tube is provided with a cage, C', having openings that communicate with the interior of the pipe M, and to the said cage is connected the lower end of a pump-rod, D'.

The operation of my invention is as follows: The pump-cylinder is submerged, and the piston is reciprocated vertically in the cylinder by operating the pump-rod D'. On the down-stroke of the piston the valves P and A' are closed, the valve Z is open to permit the water

in the lower portion of the pump-cylinder below the piston to be forced upward through the piston into the piston cage or case, and from the latter through the hollow piston rod 5 or tube B' into the delivery-pipe M. A partial vacuum is created in the upper portion of the cylinder by the descending piston, and thereby the valve F is caused to open inwardly, so as to permit the upper portion of the cylinder above the piston to be filled with water. 10 On the ensuing upstroke of the piston the valves Z and F close and the valve A' opens, thus causing the water in the upper portion of the cylinder to be forced into the piston cage 15 or case Y and up through the same and the pipe or piston-rod B' into the delivery-pipe M, as before. As the piston moves upward in the cylinder, the partial vacuum is created in the lower portion of the cylinder, and thereby 20 the valve P is opened and water is admitted into the lower end of the cylinder below the piston, ready to be forced upward on the ensuing downward stroke of the piston, as before described.

25 From the foregoing it will be readily understood that water is raised at each stroke of the piston when the same is either raised or lowered.

A double-acting pump thus constructed is 30 extremely cheap and simple, is easily manu-

factured, is readily kept in repair, and is adapted to be used in driven wells and other contracted spaces.

Having thus described my invention, I claim—

The herein-described piston for hollow-piston-rod pumps, comprising the cylinder R, having the flange or disk S at its lower end and screw-threaded at its upper end, the packing-ring U, resting on said flange, the cylindrical sleeve V, encircling the cylinder and resting on the packing-ring U, the packing-ring X, placed around the upper end of the cylinder and resting on the upper end of the sleeve V, the cage Y, screwed onto the upper 45 end of the cylinder and having the puppet-valve A' in its side near its upper end and the arms Z' depending from its top, the puppet-valve Z, seated on the upper end of the cylinder and limited in its play by the arms 50 Z', and the hollow piston-rod secured centrally in the top of the cage and leading therefrom, substantially as specified.

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

DANIEL WEBSTER.

Witnesses:

ARTIS MCBRIDE,
A. N. RANDALL.