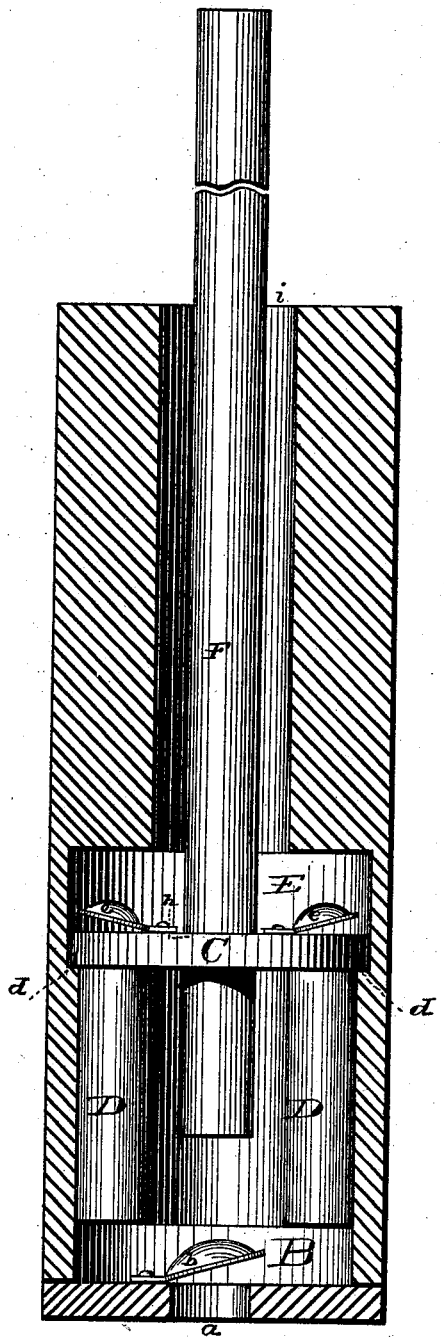
J. S. PUTNAM.
Pump.

No. 207,893. Patented Sept. 10, 1878.



WITNESSES
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INVENTOR
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UNITED STATES PATENT OFFICE.

JOHN S. PUTNAM, OF CHEROKEE, IOWA, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO S. M. PRATT AND EUGENE COWLES, OF SAME PLACE.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **207,893**, dated September 10, 1878; application filed July 2, 1878.

To all whom it may concern:

Be it known that I, JOHN S. PUTNAM, of Cherokee, in the county of Cherokee and State of Iowa, have invented a new and valuable Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

This invention relates to pumps; and the novelty consists in the combination of parts, as will be hereinafter described, by which the headless piston-rod or plunger is caused to operate in a hollow cylinder placed at the lower end of the pump-tube through which the plunger passes, the cylinder being provided with valves so arranged that the plunger, when in motion, will force the fluid admitted by the lower valve upward through the upper valves and to top of the pump-tube, so that the fluid may be raised to any required height or from any required depth.

The accompanying drawing illustrates the lower part of a pump-tube embodying one practical way of carrying out my invention.

In the annexed drawing, A represents a hollow cylinder, to be attached to the lower end of a pump-tube by any suitable means. This cylinder is provided with an opening, *a*, at the bottom, covered by a valve, *b*, opening upward, and has a water-chamber, B, within which is arranged a perforated partition or diaphragm, C, with two suspended tubes, D D, registering with the openings in the said partition, supported upon the shoulders *d* of the case. Of course, other means may be employed for supporting and bracing the pendent tubes. These tubes or pipes D extend downward within a short distance of the bottom of the chamber, to permit a free escape of the water from the chamber up through the pipes to the compartment E. The openings in the partition C immediately above the pipes D are also covered with valves *e*, opening upwardly. All the valves in the drawing are shown opened. This portion of the pump should be submerged in the fluid it is intended to raise.

Through a central opening, *h*, in the partition C the headless piston-rod or plunger F passes, establishing a communication with the water-chamber below. This opening *h* should be of sufficient size to permit the plunger to work through it easily, and yet practically water-tight. This piston-rod or plunger is of uniform size throughout its entire length, and is about half the size in cross-section of the base *i* in the upper portion of the cylinder and of the base in the tube designed to be attached to the upper end of the cylinder, so as to afford space for the passage of the water raised through the tube. The weight of this piston-rod or plunger is about equal to the weight of water it displaces in the cylinder and tubes. The upper end of the piston-rod is to be connected with suitable operative mechanism.

It will be observed that I use no piston-head and packing on the rod, nor a smooth cylinder, which are unnecessary under my method of raising water.

Operation: The piston-rod being drawn up, the valve *b* is opened inward, the chamber B becomes charged, and when the piston-rod is forced down the valve *b* closes, and a body of water in the chamber is forced upward through the tubes D, when the upper valves, *e*, open equal in space to that portion of the piston-rod submerged in the chamber below the partition. In the upward movements of the piston-rod, the water contained in the chamber will buoy up or float the piston-rod vertically. This operation is continued, raising or forcing the water intermittently through the pipes and pump-tubes to any required height. An increase in the distance the fluid is to be elevated requires no extra power to operate the piston-rod.

What I claim as my invention is—

The means, substantially as described, for raising water, consisting of a cylinder, A, with valve *b* and chamber B, partition C, with valves *e*, pendent pipes D, and the headless piston-rod F, operated in the manner as described.

JOHN S. PUTNAM.

In presence of—
R. H. SCRIBNER,
JOHN FARLEY.