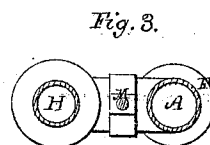
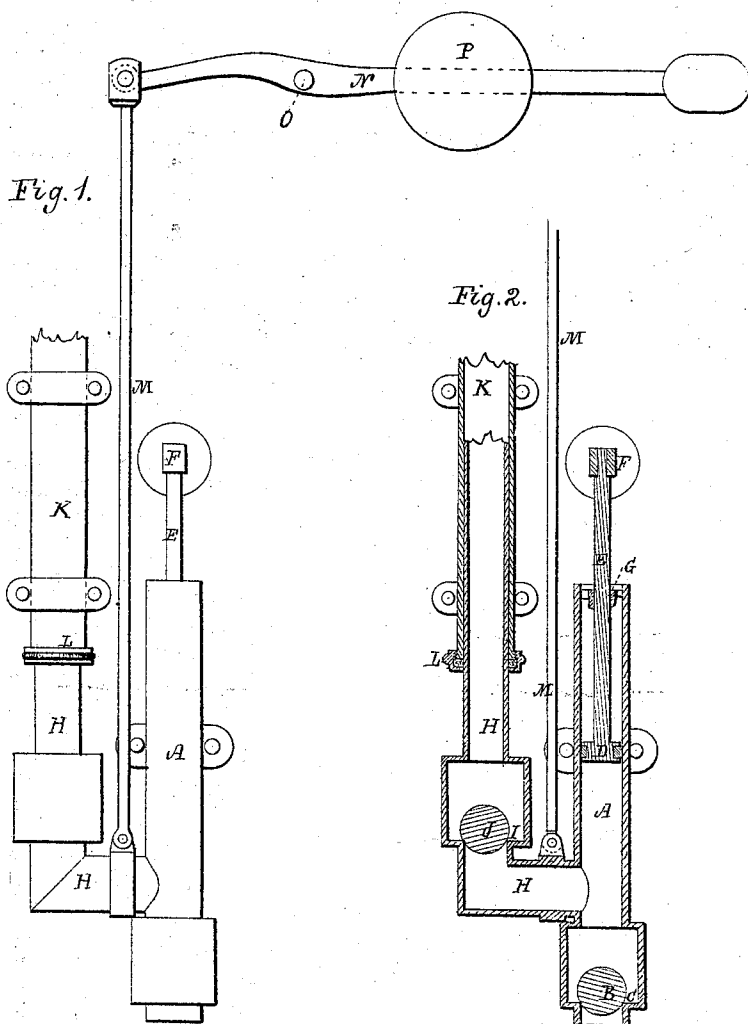


L. FAIRBANKS.
Pumps.

No. 150,679.

Patented May 12, 1874.



WITNESSES.
Francis E. Fayou... Lorenzo Fairbanks.
W. C. Boardman... A. Curtis, Atty.

UNITED STATES PATENT OFFICE.

LORENZO FAIRBANKS, OF BOSTON, ASSIGNOR OF ONE-FOURTH HIS RIGHT
TO C. T. FROST, OF MEDFIELD, MASSACHUSETTS.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **150,679**, dated May 12, 1874; application filed
March 20, 1874.

To all whom it may concern:

Be it known that I, LORENZO FAIRBANKS, of Boston, Suffolk county, Massachusetts, have invented an Improved Pump, or Method of Elevating or Forcing Water, of which the following is a specification:

The purpose of this invention is to obviate, to a great degree, the power required to elevate or force water without a head or pressure behind it; and I accomplish my object by counterbalancing the weight of the water in the service or delivery pipe, (as hereinafter stated,) and allowing this water to exert its weight upon the counter-balance, in order that no effort is required to lift the latter; the result being that the only power required to operate the pump is that requisite to overcome the friction upon the various parts, and to lift the amount of water admitted at each stroke to the lifting-cylinder.

The drawings accompanying this specification represent in Figure 1 a side elevation, and in Fig. 2 a vertical section, and Fig. 3 a horizontal section, of an apparatus which embodies a practical method of carrying out my invention.

In these drawings, A represents a vertical tubular cylinder, open at both top and bottom to the influx of water, and provided at its lower end with a valve, B, and seat or port C, the said valve opening upward. The cylinder A moves vertically to and fro over or about a stationary piston, D, which is disposed within it at a short distance above the valve B, the rod E of the piston rising through and above the cylinder, and being supported in a stationary bearing or standard, F, a guide, G, being applied to the top of the cylinder and encompassing the piston-rod, to steady the motion of said cylinder. The cylinder A has a branch tube, H, which is placed alongside of and is connected with it, a free communication being established between the two at their lower parts, and the branch H being provided at its lower end with a valve and seat, I and J, in manner similar to the valve and seat supplied to the cylinder A, and, like it, opening upward. The tube H enters and slides within an upright pipe, K, which extends upward into the apartment or structure to be supplied with water, the tube and pipe being practically one,

and constituting the main service-pipe. A stuffing-box is represented in the drawings, at L, as applied to the lower end of the service-pipe, and encircling the tube H, to prevent leakage of water at this point; but, in lieu of this stuffing-box, a flexible sleeve or bellows joint may be adopted to reduce the friction attendant upon the use of a stuffing-box. To the lower part of the tube H, or any convenient point, I pivot one end of a connecting-rod, M, the upper end of which is pivoted to the shorter arm of a handle or brake, N, the fulcrum of this handle being shown at O, while sliding upon it is an equipoise-weight, P. I propose, under most circumstances, to submerge this pump in water, and, if placed in a well, the rod M is to extend upward above the mouth of such well.

Its operation is as follows, (supposing the handle N to be depressed and the cylinder A at its highest point:) The handle is raised, and as the cylinder lowers within the water the latter rises through the valve-port C and fills the cylinder below its piston D. The handle is now depressed and the cylinder raised, the valve B closing by impact with the body of water intervening between it and the piston D, and forcing such water upward into the tube H, and thence into the service-pipe K. This operation is continued until the service-pipe is filled, when the weight P is slid upon the handle N until it counterbalances, or about so, the body of water within the said pipe. The cylinder is again lowered, and during its next ensuing ascent the amount of water within it, above its valve, is driven into the lower part of the tube H and pipe K, and displaces from the upper and discharging end of such pipe a corresponding amount of water, the valve J closing the moment the lifting-power is removed from the handle N and cylinder A, and by this means confining within said pipe K the water it contains; consequently, the weight of this column of water equipoises the weight P, and no power is required to raise it.

From the above it will be seen that the only power required to raise water within the service-pipe, after it is filled—no matter what the height of the latter may be—is what is necessary to overcome the friction upon the vari-

ous parts of the apparatus, and of the water within the pipe, and to lift the water contained in the cylinder A at each ascent; since the weight of the ball P counterbalances the weight of the water within the service-pipe, and the weight of this water in turn equipoises the weight of the ball P, for the reason that it falls with the cylinder A.

In ordinary pumps, sufficient power must be applied to overcome the weight of the column of water within the service-pipe, as, if a counterbalancing-weight were applied to the handle, this weight must be raised with the handle, for the reason that the body of water within the service-pipe is held up therein and cannot fall back in consonance with the raising of the handle.

In brief, I am enabled to counterbalance the weight of the water within the service-pipe, and compel this same weight of water to raise the counter-balance, and economize the power which the raising of this weight would otherwise render necessary.

By the employment of a stationary piston and a valvular cylinder encompassing and sliding to and fro of it, and a secondary valvular tube making part of or connected with said cylinder to receive the water discharged from the latter, I obtain great simplicity of construction.

Therefore, I claim as my invention, and desire to secure by Letters Patent of the United States, the following:

The combination, with the valvular cylinder A, valvular tube H, and stationary piston D, of the fixed service-pipe K, and the counter-balance P connected with the moving parts A H, all arranged and operating together as herein shown and set forth.

LORENZO FAIRBANKS.

Witnesses:

F. CURTIS,

W. E. BOARDMAN.