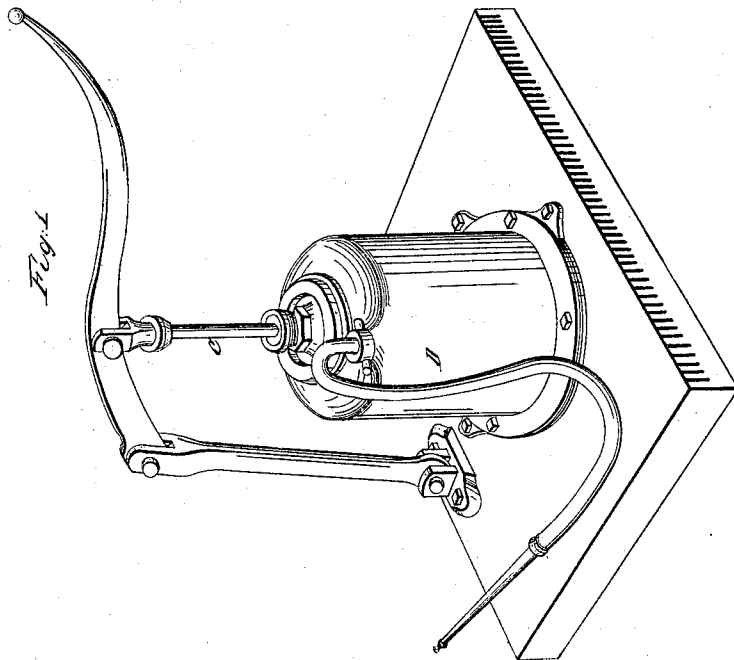
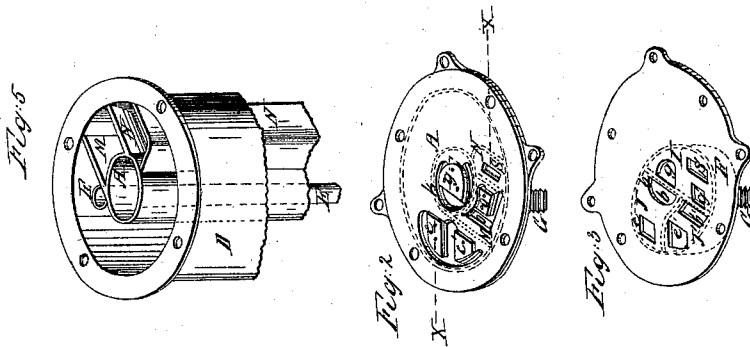
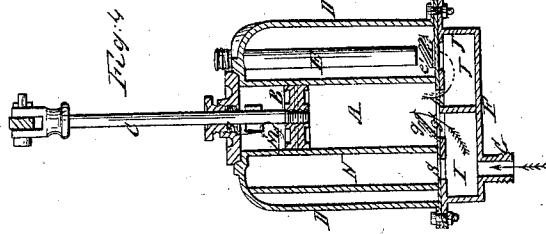


J. H. Mc Gowan,

Double-Acting Pump,

Patented June 27, 1854.

N^o 11,169.



UNITED STATES PATENT OFFICE.

JOHN H. MCGOWAN, OF CINCINNATI, OHIO.

FORCE-PUMP.

Specification of Letters Patent No. 11,169, dated June 27, 1854.

To all whom it may concern:

Be it known that I, JOHN H. MCGOWAN, Jr., of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a view in perspective of a double acting force pump which embraces my improvement; Fig. 2 represents a view in perspective of the valve chamber and valves detached, showing also in red lines the lower margin of the upper chambers of the pump; Fig. 3 represents a similar view of the valve chamber with the valves detached to exhibit the several openings for the ingress and egress of the water; Fig. 4 represents a section of the pump cut at the irregular line XX of Fig. 2; and Fig. 5 represents a view in perspective of the pump inverted, the valve chamber being removed.

The pump represented in the drawing is of the variety known as a double acting force pump. It has a vertical cylinder (A); a piston (B) which works in the cylinder, a piston rod (C) that passes through a stuffing box in the cap of the cylinder. The cylinder is surrounded by a case (D) which forms an air chamber to render the issue of water from the discharge pipe more equable. A part of the annular space between the cylinder and surrounding case is occupied by the delivery pipe (E); a side pipe (M) for conducting water to and from that part of the cylinder which for the time being is above the piston; and a vacuum chamber (N) which communicates with the supply or induction pipe below the lowest valve, but having no communication with those parts of the pump above the lower valve. The important office which this chamber thus arranged has to perform will be hereafter explained.

Immediately beneath the cylinder and air chamber the valve box (F) is placed. This box is divided into compartments, to separate the two delivery valves from the supply valves. The suction pipe (G) terminates in the compartment (I), which is fitted with valve openings (g, g') to communicate with the upper and lower end of the cylinder alternately, to supply it with water at one end, while the piston is discharging it from the other end. The compartments (J, J')

are also fitted with valve openings (e, e') that communicate with the upper and lower end of the cylinder alternately, to conduct the water discharged by the piston into the air chamber through the passages (b, b'). It will be seen that all the valves are placed below the air chamber and above the vacuum chamber, and from the direction of the currents to and from the pump, as indicated by the arrows, it will be seen that one half of the valves are closed and the other half open; viz: When the supply valve is open, which permits the water to be drawn into the lower end of the cylinder, the valve which permits the water to be discharged from the upper end of the cylinder is also open. And when these valves are closed the others are open.

The vacuum chamber is closed at the top and sides, but at its lower end communicates with the suction or supply pipe below all the valves by a passage (S) which remains constantly open. Preparatory to setting up this pump, it should be inverted, and the vacuum chamber filled with water. This water will be retained in the chamber by the pressure of the atmosphere acting on the water below when this atmospheric pressure is not neutralized by the suction of the piston above, which when working fast often breaks the column of water below the induction valve, by drawing it out of the valve box faster than it is supplied through the suction pipe; when this state of things would take place in other pumps, and it tends to take place in this, the water in the vacuum chamber descends, and prevents the breaking of the supply column, and the suction of air at the joints of the valve chamber, which the heavy shock and strain produced by the break of the supply column causes; it also saves much of the wear and tear of the lower valves which take place in the ordinary pump, and it furnishes a more equable supply of water than has heretofore been possible; and in connection with the air vessel above, enables this pump to elevate more water with a given amount of power, than can be done by any other piston pump known.

After the water has descended from the vacuum chamber to compensate the deficient supply by the suction pipe at the commencement of the stroke of the piston, and while the column of water in the suction pipe is being put in motion, the further supply of water is readily furnished by the suction not

only to fill the cylinder, but also to return
to the vacuum chamber, the water drawn
thence at the commencement of the stroke,
in this way the excess of water supplied by
5 the suction pipe after the current is fairly
established at one stroke, is held in store, to
supply the deficiency at the commencement
of the next strike, by which means the force
employed to give momentum to the water is
10 not lost, as in other piston pumps.

What I claim as my invention, and desire
to secure by Letters Patent, is—

The combination of an air chamber com-

municating with the pump above all the
valves, with a vacuum chamber communicat- 15
ing with the pump below all the valves,
whereby the elevation of water is rendered
more equable, and effected with a saving of
power as herein set forth.

In testimony whereof, I have hereunto 20
subscribed my name.

JOHN H. MCGOWAN.

Witnesses:

WM. CHIDSEY,

JAMES C. GIFFEN.