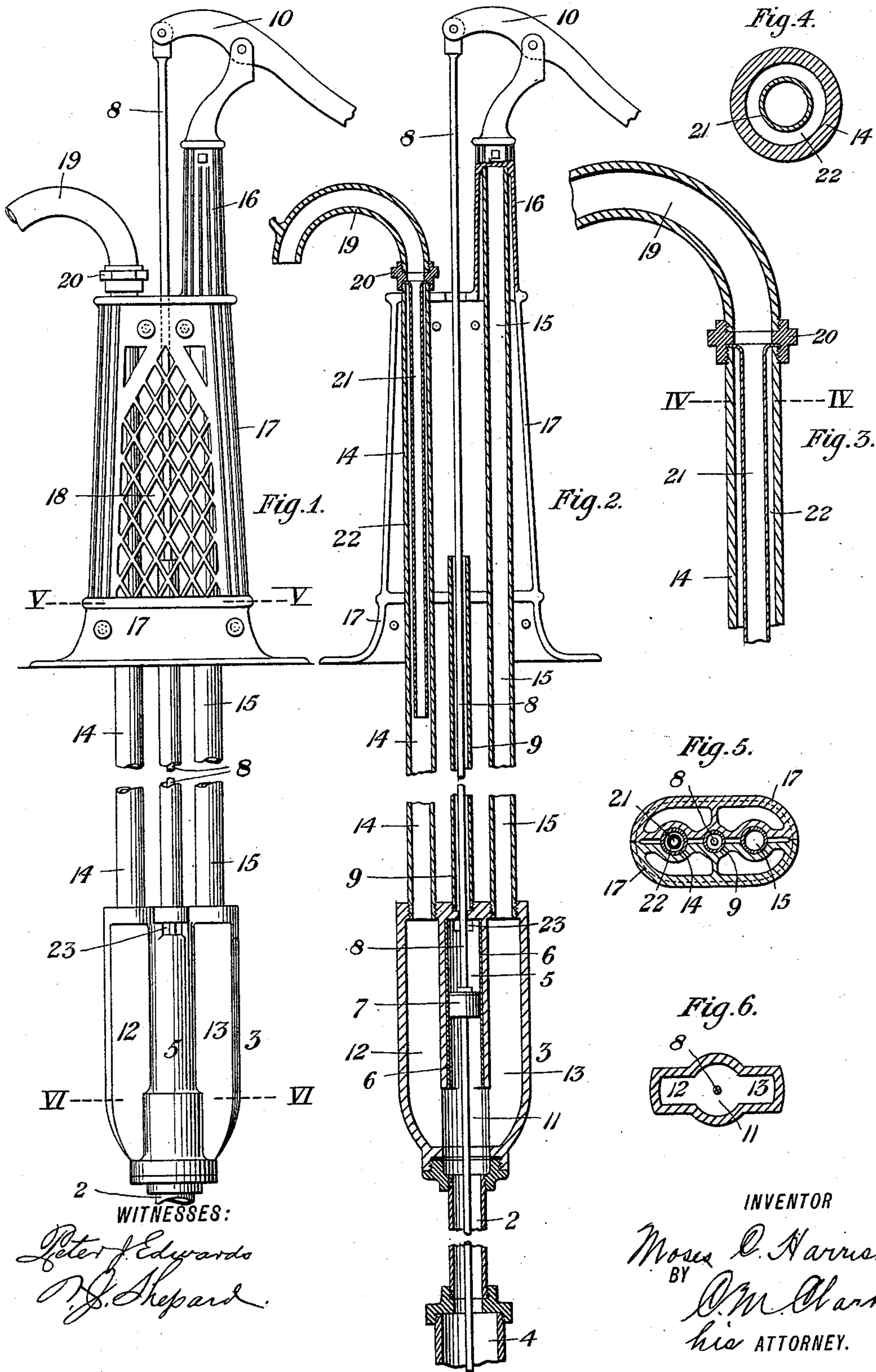


(No Model.)

M. C. HARRISON.  
LIFT AND FORCE PUMP.

No. 583,747.

Patented June 1, 1897.





# UNITED STATES PATENT OFFICE.

MOSES C. HARRISON, OF PITTSBURG, PENNSYLVANIA.

## LIFT AND FORCE PUMP.

SPECIFICATION forming part of Letters Patent No. 583,747, dated June 1, 1897.

Application filed April 18, 1896. Serial No. 588,133. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES C. HARRISON, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in Lift and Force Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this application, in which—

Figure 1 is a view in side elevation, partly broken away, of my improved lift and force pump. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a detail sectional view, on an enlarged scale, of the upper portion of the discharge pipe and spout. Fig. 4 is a cross-sectional view, on an enlarged scale, taken on the line IV IV of Fig. 3. Fig. 5 is a cross-sectional view on the line V V of Fig. 1. Fig. 6 is a similar view on the line VI VI of Fig. 1.

Similar numerals of reference refer to like parts wherever used throughout this specification.

My invention relates to the class of double-acting force-pumps, and is designed with especial reference to giving a continuous stream of constant pressure and force; and it consists in a novel arrangement of double chambers with a working cylinder and plunger located between them, the chambers and cylinders terminating at the bottom in a common chamber above the valve.

It also consists in a certain novel construction of interior tube secured within the uptake-pipe and terminating in the base of the spout, together with other features of construction, which shall be more fully hereinafter set forth.

Referring now to the drawings, 2 is the influent pipe, which may be of any convenient length, according to the depth of the well, secured at the lower end to the cylinder of the pump-chamber 4 and at the top to the lower end of the equalizing-chamber 3. A valve is located at the base of the lower cylinder 4 in the customary manner, opening upwardly in the direction of the flow, but not downwardly.

The chamber 3 consists of a central working cylinder 5, having a brass lining 6, in which is located the plunger 7, secured to the plun-

ger-rod 8, which passes upwardly through the surrounding pipe 9 and the frame of the pump and is attached to the lever 10. By this construction the rod 8 is protected and is free to oscillate while in motion, no stuffing or packing being necessary by reason of its position outside and independent of the uptake-pipe. Immediately above the top of the connecting-pipe 2 is a common opening 11, leading into the divergent chambers 12 13, on each side of the cylinder 5, and from the tops of these chambers extend upwardly the pipes 14 15, the pipe 14 acting as an uptake-pipe and the pipe 15 as an air-chamber, terminating in the top of the lever-supporting post 16, the top of the pipe being tightly closed.

17 is the frame or pedestal of the pump, made in two halves bolted together, tightly embracing the various pipes and having at each side openings 18 for ventilation.

A spout 19 is secured to the top of the uptake-pipe by a coupling 20, and between the top of the pipe and the coupling is firmly clamped the flanged top of a thin brass tube 21, of a somewhat less diameter than the interior of the pipe 14, so that an intervening space 22 is left between them, the purpose of which is to serve as an auxiliary air-chamber to assist in equalizing the flow.

23 is an air-opening at the top of the working cylinder 5 and for escape of any leakage past the plunger 7.

The auxiliary air-chamber is a valuable feature of my invention, the water passing upwardly through the pipe 21 and out through the spout 19 in a free and uninterrupted stream.

The operation of the plunger in the cylinder 5 serves in its upward motion to fill the chambers 11, 12, and 13, and in the downstroke and subsequent up and down strokes a continuous flow is maintained through the pipe 14, due to such motion of the plunger and to the pressure of the air in the pipe 15 and in the intervening air-space 22 between the pipes 14 and 21.

The construction of my improved pump is very simple and the operation in practice has proved it to be very effective. It can be used with equal success in either shallow wells or those of a depth up to two hundred



feet and can be operated with comparatively little power.

Changes may be made in the construction by the skilled mechanic without departing from my invention, and the various parts and proportions may be varied to suit different requirements of use, since I desire to be understood as not limiting myself to the exact construction as shown in the drawings.

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

1. The combination, in a lift and force pump, of an equalizing-chamber, a working cylinder and its plunger, an upwardly-extending pipe having a closed top opening into said chamber, said pipe forming an air-chamber, and an uptake-pipe also opening into said chamber provided with an interior pipe of reduced diameter whereby an air-chamber is formed between the uptake-pipe and such interior pipe; substantially as described.

2. The combination, in a lift and force pump, of an equalizing-chamber having in its middle portion a central working cylinder and a plunger operating therein, an upwardly-extending air-chamber on one side thereof hav-

ing an extended closed top pipe, and an uptake-pipe on the other side provided with an interior pipe of reduced diameter whereby an air-chamber is formed between the uptake-pipe and such interior pipe, substantially as set forth.

3. The combination, in a lift and force pump, of an equalizing-chamber having in its middle portion a central working cylinder and a plunger operating therein, an upwardly-extending air-chamber on one side thereof having an extended closed top pipe, an uptake-pipe on the other side provided with an interior pipe of reduced diameter whereby an air-chamber is formed between the uptake-pipe and such interior pipe, and an influent pipe opening into the equalizing-chamber and provided at its bottom with a working cylinder supplied with a valve; substantially as described.

In testimony whereof I have hereunto set my hand this 9th day of March, 1896.

•MOSES C. HARRISON.

Witnesses:

PETER J. EDWARDS,  
C. M. CLARKE.