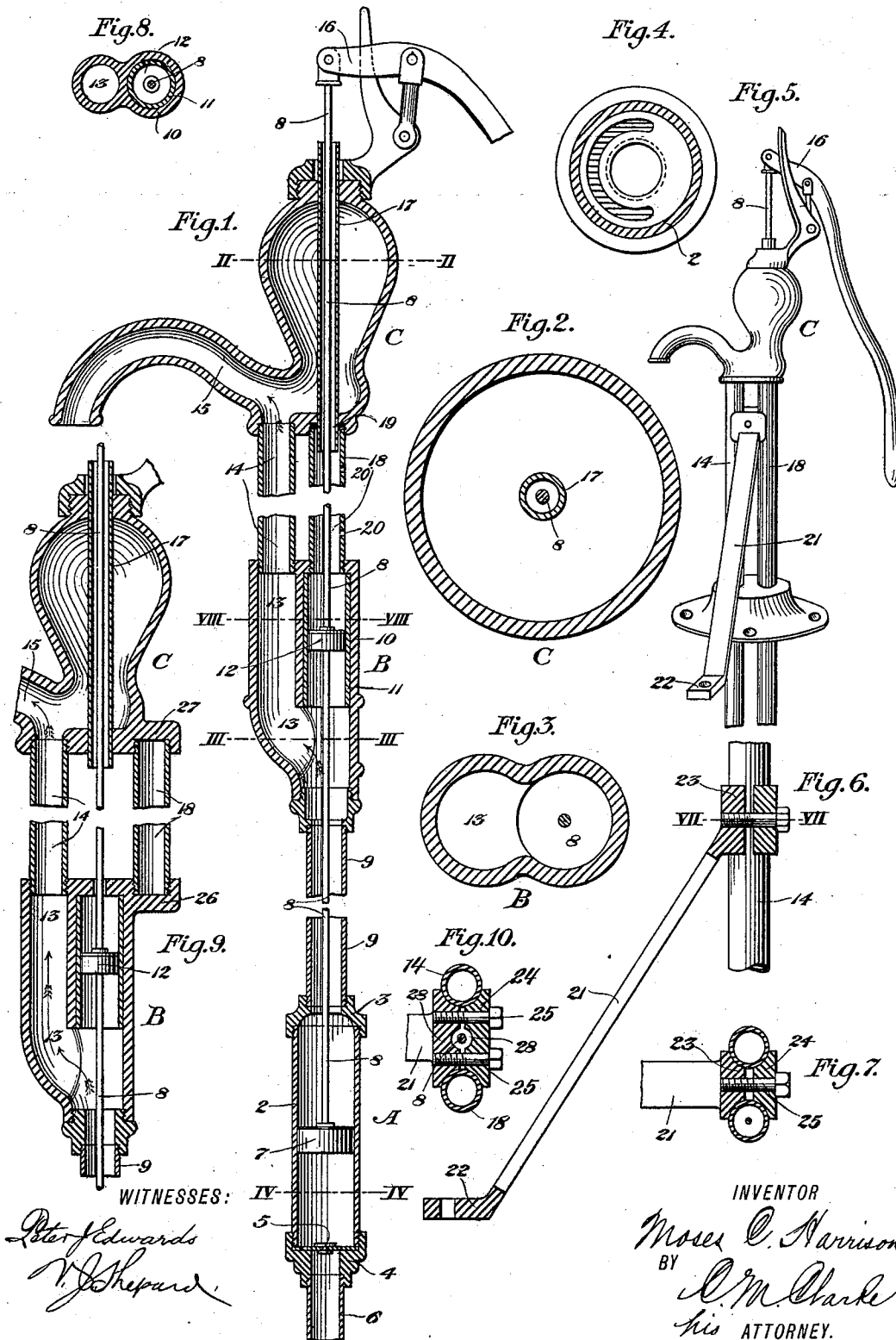


(No Model.)

M. C. HARRISON.
FORCE AND LIFT PUMP.

No. 583,745.

Patented June 1, 1897.



UNITED STATES PATENT OFFICE.

MOSES C. HARRISON, OF PITTSBURG, PENNSYLVANIA.

FORCE AND LIFT PUMP.

SPECIFICATION forming part of Letters Patent No. 583,745, dated June 1, 1897.

Application filed April 18, 1896. Serial No. 588,131. (No model.)

To all whom it may concern:

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

Figure 1 is a vertical longitudinal section, partly broken away, through a pump made in accordance with my invention. Fig. 2 is a cross-sectional view, on an enlarged scale, taken on the line II II of Fig. 1. Fig. 3 is a similar view taken on the line III III of Fig. 1. Fig. 4 is a similar view taken on the line IV IV of same figure. Fig. 5 is a view in perspective of the upper part of the pump provided with my improved adjustable brace. Fig. 6 is a detail view, partially in section, illustrating the brace and method of attachment. Fig. 7 is a cross-sectional view taken on the line VII VII of Fig. 6. Fig. 8 is a cross-section on the line VIII VIII of Fig. 1. Fig. 9 is a partial vertical longitudinal section similar to Fig. 1, but illustrating a different arrangement of brace-pipe. Fig. 10 is a cross-sectional view similar to Fig. 7, illustrating the method of clamping the brace 21 to the form of construction illustrated in Fig. 9.

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

My invention relates to the class of hand-pumps for domestic use in which an air-chamber is employed to regulate the flow of the water, and it refers more particularly to the construction and arrangement of parts by means of which I am enabled to secure a steady flow of water and to the means for protecting the rod in its passage through the air-chamber. It refers also to an improved brace and means for securing it adjustably to the members of the pump.

Referring now to the drawings, it will be seen that the pump consists of three main portions A, B, and C, with intermediate connections, as shall be hereinafter set forth. The pump proper is comprised in the portion A and consists of a cylindrical barrel 2, con-

nected above and below with reducers 3 4 and provided at the bottom with a check-valve 5, through which the water may freely pass upwardly, but not downwardly. A section of pipe 6 may extend downwardly for any desired distance. The piston 7 of the pump is attached to the lower end of the piston-rod 8 and is constructed in any preferred manner so as to allow water to pass freely upwardly through it, but not down, as is commonly the case in this form of pumps.

Between the pump A and the equalizing-chamber B is located a section of pipe 9, inclosing the rod 8, and through which the water is free to pass upwardly. The equalizing-chamber consists of a main portion 10, circular in cross-section, preferably lined with brass 11, within which operates a plunger 12, secured to and actuated by the rod 8.

Leading off from the main interior of the equalizing-chamber B is a branch chamber 13, extending vertically upward to a level with the top of the equalizing-chamber and forming therewith an integral construction. The internal diameter of the equalizing-chamber B is approximately equal to one-half the area of the pump-chamber A, and the opening leading into the chamber 13 is fully as large as the internal diameter of the pipe 14, so as to give free passage therethrough, such area being approximately one-half the area of the chamber B.

Extending from the top of the chamber 13 to the base of the air-chamber C is the main trunk-pipe 14, terminating in the base of the chamber C and leading directly into the gooseneck 15, forming the spout of the pump. The piston-rod 8 extends upwardly through the center of the air-chamber and is connected at the top in the usual manner to the lever 16. For the purpose of protecting the rod from contact with the water within the air-chamber a short length of tubing 17 is introduced within the chamber, extending from the top to the bottom thereof and making a tight joint at each end. In this manner I am enabled to dispense with the usual stuffing-boxes, while the diameter of the tube is sufficiently large to permit of the oscillation of the rod due to the travel of the end of the lever in the arc of a circle. Between the upper end of the equalizing-chamber and the

lower end of the air-chamber in line with the piston-rod is preferably inserted a stiff connection 18, which for convenience and cheapness I have constructed of pipe, although one or more rods or any other desirable construction would serve equally well, as its function is to rigidly connect the two chambers, while serving also for a protecting covering for the rod 8. At each end it is tapped into each chamber, and for the purpose of more securely packing the joint between the lower end of the tube 17 and the shell of the air-chamber I prefer to insert a gasket 19, so that when the pipe 18 is screwed in it will bear on such gasket and tightly pack it around the lower end of the tube 17, such lower end projecting downwardly for a short distance.

The pipe 18 may be perforated at intervals, as at 20, to permit of the escape of any leakage past the plunger 12.

In the construction illustrated in Fig. 9 of the drawings the connection 18 is set to one side of the center line of the rod and, as shown, consists of a section of pipe screwed into lugs 26 27 in the upper portion of the frame of the chamber B and lower portion of the frame of the chamber C. This construction makes a very firm and substantial arrangement, the rod 8 being located between the two pipes and entirely separate from each.

Secured to the main vertical members of the pump structure is the brace 21, provided at its base with a shoe 22 for securing to the floor, and the upper end 23 is made to fit in between the two pipes 14 and 18, as clearly shown in Fig. 7, the clamp 24, similarly constructed, being placed on the opposite side, and the two parts being connected by a bolt 25. In attaching the brace 21 to the form of pump illustrated in Fig. 9 openings 28 are left in the upper portion of the brace and clamp to give clearance for the rod 8, and two bolts 25 are employed, as shown. Thus the clamp may be attached at any point by loosening the bolt and raising or lowering the brace until in the proper position for securing the shoe 22 to the floor, when the clamp may be again tightened by the bolt or bolts.

The operation is as follows: Vertical reciprocating motion of the rod 8 will cause water to be pumped in the usual manner until it rises and fills each chamber of the equalizing-chamber B, when each successive rise of the piston 7 will cause water to be lifted through pipe 9 and into chamber 13, each al-

ternate downward stroke of the plunger 12 emptying the contents of its chamber also into chamber 13, thus supplying a continuous uninterrupted stream through chamber 13, pipe 14, and spout 15, the air-chamber C operating to cushion and regulate the flow in the well-known customary manner.

The advantages of my invention will be appreciated by those skilled in the art to which it pertains. It is very practical and efficient and capable of giving in service more satisfactory results than by the use of any other form of pump known to me. The special advantages of a protected piston-rod running through the center of the air-chamber without the use of stuffing-boxes and the improved adjustable brace are features of novelty and value.

Changes and modifications may be made by the skilled mechanic without departing from my invention, since I do not desire to be limited to the exact form of construction shown in the drawings, but to include any equivalent therefor.

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

1. In combination with a force-pump provided with an equalizing-chamber, an air-chamber, an intervening communicating main trunk conducting-pipe, and a brace-pipe, with a piston-rod passing through the air-chamber; a shield-pipe surrounding the piston-rod making an independent tight joint at the top and bottom of the air-chamber respectively, substantially as set forth.

2. In combination with a force-pump provided with an equalizing-chamber, an air-chamber, an intervening communicating main trunk conducting-pipe, and a perforated brace-pipe, with a piston-rod running down through the brace-pipe; a shield-pipe surrounding the piston-rod making a tight joint at the top and bottom of the air-chamber respectively, independent of the brace-pipe, with a gasket surrounding the lower projecting end of the shield-pipe, against which gasket the upper end of the brace-pipe is screwed, substantially as set forth.

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.