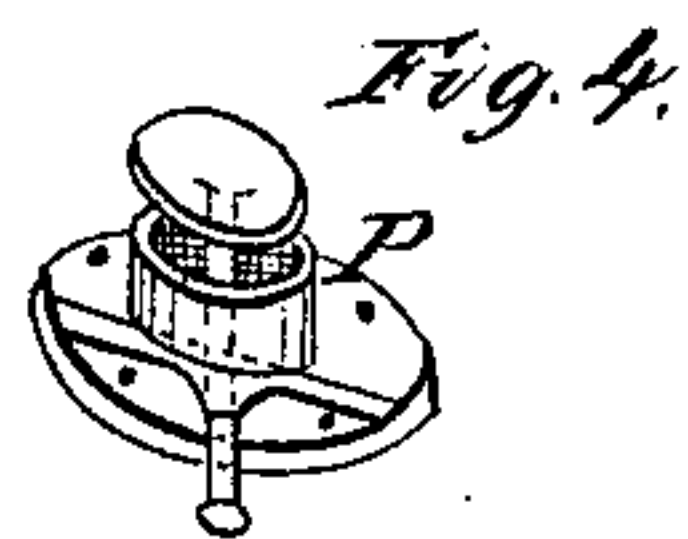
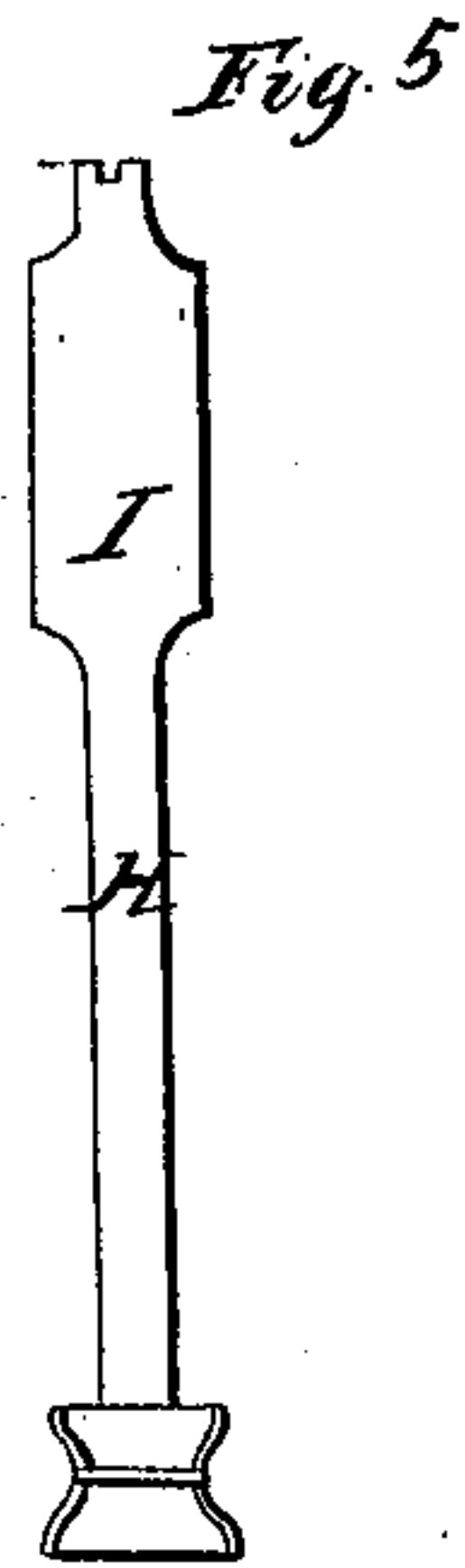
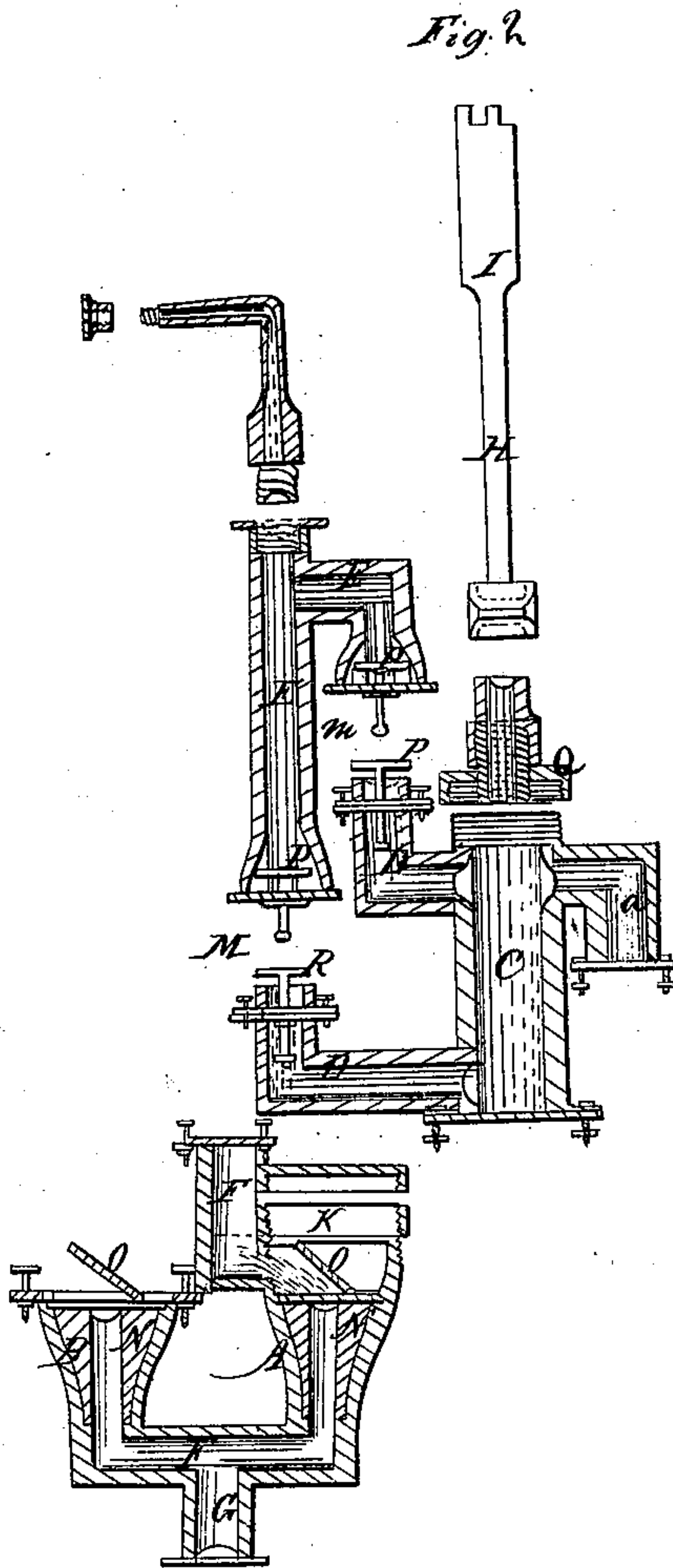
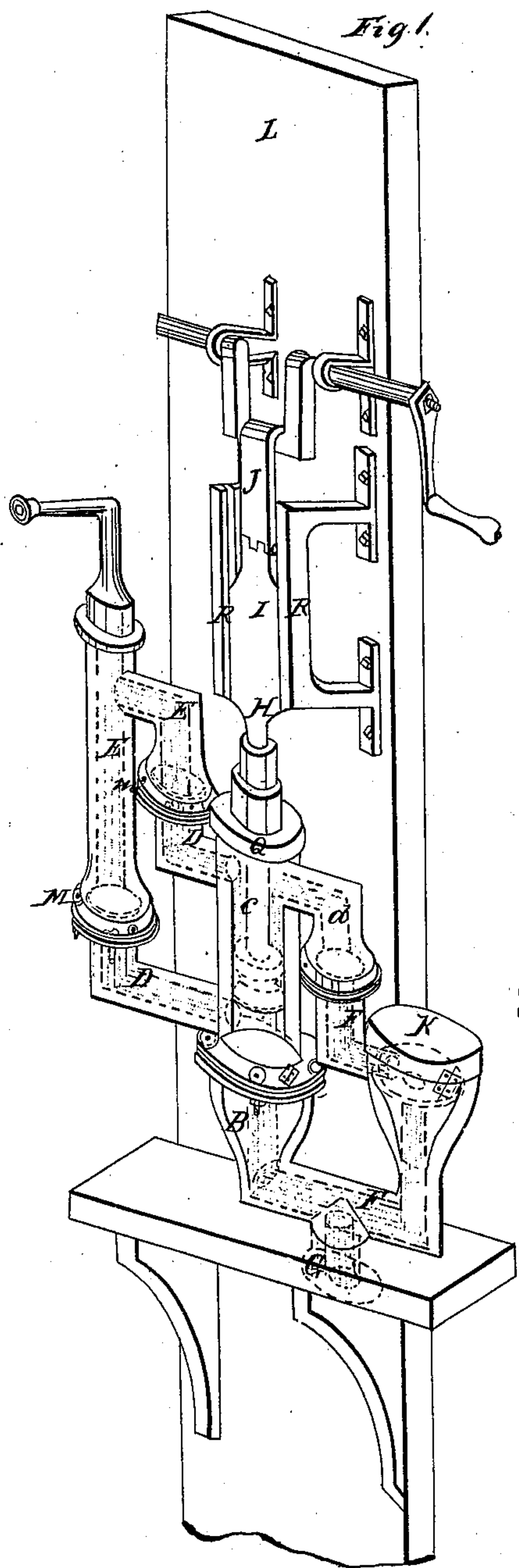


*J. Smart,*  
*Force Pump.*

*No 589.*

*Patented Feb. 3, 1838.*





# UNITED STATES PATENT OFFICE.

JOSEPH SMART, OF EASTON, PENNSYLVANIA.

## PUMP.

Specification of Letters Patent No. 589, dated February 3, 1838.

*To all whom it may concern:*

Be it known that I, JOSEPH SMART, of the borough of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a true and exact description.

The nature of my invention consists in having constructed a pump of double operation with the main or lower valves so inserted as that they may be easily and readily removed for repair and again replaced without disturbing or removing the remainder of the pump and without the necessity of working in the well and in the combination of such facility of repair with the double operation by a single rod and the perpendicular action of the valves, as also the extreme cheapness and simplicity of the whole, as the entire pump may be cast.

To enable others skilled in the art to make and use my invention, I give the following description of its construction and operation.

Figure 1 is a general external view of the whole pump when put together for use. Fig. 2 is a vertical section of the whole pump with the joints open. Fig. 3 is a view of one of the main or lower valves. Fig. 4, is a view of one of the upper valves and Fig. 5, is a vertical section of the piston rod and plunge, each part where it is visible is lettered alike in all the figures.

The main cylinder of the pump C, is cast with the pipes D, D, *d* attached and is coated inside with lead. The suction pipes G and F, with the valve box is A and B, and the upper pipe (F,) are also cast in one piece. The pipes E, E, are also cast in one piece and are attached by flanges to the pipes D, D, at the joints M, *m*, by means of nuts and screws. The valve box B, is attached in the same manner to the bottom of the cylinder and the upper pipe F, to the pipe *d*. The valve boxes A, and B, are filled with the valves N, (Fig. 2) made of gum or other wood lapped with tin and covered with light cement so as to close the boxes air tight, or made of metal and ground smooth enough to fill the boxes air tight. On the top of the valves is a common leather clack O, which in the box B, opens into the bottom of the cylinder, and in the box A, opens into the space between itself and the cap K, which is made of metal and fastened air tight on the top of the box A.

P, (Fig. 2) is a valve formed by a flange with a cup cast solid upon it having a spindle passing through and working up and down in a hole in the center of the flange and surmounted by a circular plate or valve which when down fits on tight on the rim of the cup. The valve P, is placed in the joints M, *m*, with the flange between the flanges of the pipes E, E, and D, D, and screwed up with them, with the leathers over and under the flange of the valve P. The piston rod descends through a common packing box and cap Q, into the cylinder C, having at the lower end a plunge consisting of two leather boxes in the form of wafer or pill boxes, with a circular brass plate filling the bottom of each, the boxes being slightly conical in their form so that the mouth of the box has a diameter a little greater than the bottom—the bottoms of these two boxes are then placed together and the end of the piston rod passes through two holes in the center of each of the two brass plates and is secured by a screw and bur. The top of the piston rod H, terminates in a guide I, which traverses on a groove in stays R, R, and is attached by an iron strap J, to a crank by which the pump is worked. The whole of the pump is fastened upon a board or plank S.

The operation of the pump is as follows: When the piston descends in the cylinder a vacuum is formed above the plunger into which the water rushes through the suction pipes G, F, and the valve N, and the pipes F, *d*, when the rod ascends this water is forced through the valve P, at the joint *m*, into the ascending pipe E, and at the same time a vacuum is created below the plunge which is supplied by a rush of water through the valve N, in the box B, into the lower part of the cylinder which water is by the next descent of the rod and plunge also forced into the ascending pipe E, through the other valve P, at the joint *m*.

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

The construction of the box A, and the location of the valve N, in combination as herein above described.

JOSEPH SMART.

Witnesses:

R. N. BROUHEAD, Jr.,  
C. L. EBERLE.