

W. E. Watters,

Pump Piston,

N<sup>o</sup> 15,799.

Patented Jan. 3, 1865.

Fig. 2.

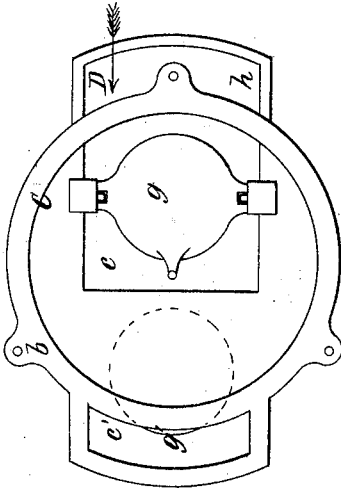


Fig. 6.

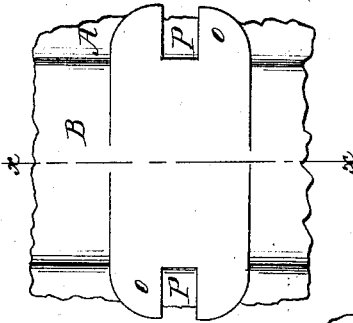


Fig. 7.

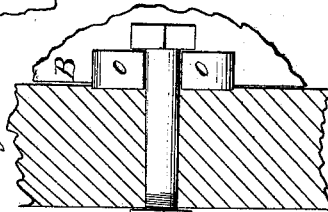


Fig. 3.

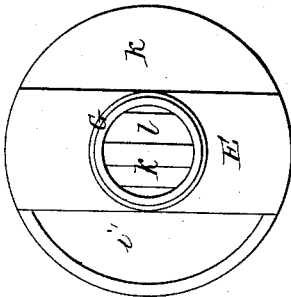


Fig. 4.

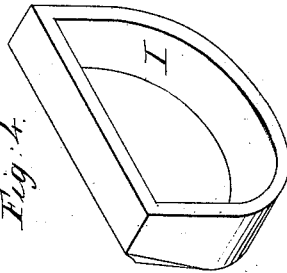


Fig. 5.

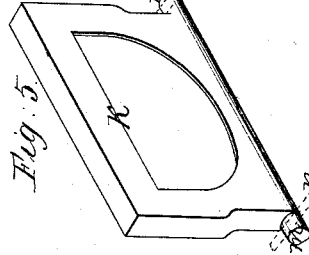
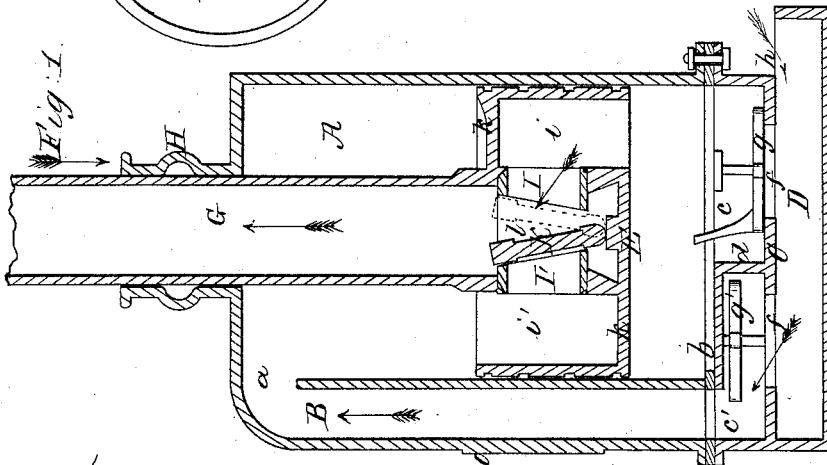


Fig. 1.



Witnesses,  
Jay Hoyatt.  
Wm. N. Emerson

Inventor  
Mary P. Watters,  
Per J. Fraser & Co.,  
Attch

# UNITED STATES PATENT OFFICE.

MARY P. WATTERS, OF EAST BEND, KENTUCKY, ADMINISTRATRIX OF  
WALTER E. WATTERS, DECEASED, ASSIGNOR TO AQUILA H. PICKER-  
ING, OF SALEM, IOWA.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 45,799, dated January 3, 1865.

*To all whom it may concern:*

Be it known that WALTER E. WATTERS, formerly of Lockport, in the county of Niagara and State of New York, but now deceased, did invent a certain new and useful Improvement in Pumps; and I, MARY P. WATTERS, of East Bend, in the county of Boone and State of Kentucky, administratrix of the estate of the said WALTER E. WATTERS, do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a central vertical section of the improved pump; Fig. 2, a plan of the bottom or valve portion of the pump detached from the cylinder; Fig. 3 a plan of the piston, the piston or eduction tube being in cross-section; Fig. 4, a perspective view of one of the port rims or frames that is cast in the piston; Fig. 5, a similar view of the valve that is cast in the piston; Figs. 6 and 7, a rear and side view, respectively, of the lug-fastening by which the pump is secured to the plank.

Like letters of reference indicate corresponding parts in all the figures.

This pump is a force-pump in which a cylinder is employed having a side passage, in which cylinder the piston reciprocates, forcing the water upward in both the down and up strokes.

The invention consists in the combination of a hollow or tubular piston-rod with such a double-acting force-pump; also, in the construction of the piston-head itself, having cast therein the port rims or frames and the valve; and, furthermore, in the manner of attaching the pump to the plank, the whole arranged and operating substantially as herein-after set forth.

As represented in the drawings, A is a suitable pump-cylinder, having a side passage or pipe, B, that communicates at the top by an opening, *a*. This cylinder rests upon and is bolted to a bottom, C, of similar outline form, the joint being made tight by proper packing, *b*. This bottom is provided with two compartments, *c* and *c'*, separated by a partition, *d*, the compartment *c* opening into the cylinder proper, while *c'* opens into the side

passage, B. Beneath these compartments is situated an induction-passage, D, and communication is sustained through by means of ports *f f'*, covered, respectively, by valves *g g'*. The passage D extends out on one side beyond the plane of the cylinder, forming a mouth, *h*, as shown clearly in Figs. 1 and 2. This is for the purpose of receiving the water into the pump in a downward direction instead of an upward one, as in ordinary devices. Sediment and dirt are thereby prevented from entering the pump to obstruct the valves or the other working parts. Much difficulty is usually experienced in common pumps from the same being situated near the bottom of the well and having the ports opening directly downward; so that mud can be drawn in.

In addition to the advantage above described, the retaining of the water in the passage D equalizes the action, so that the valves will work more regularly and uniformly than if they opened directly from the bottom of the pump. Furthermore, as the mouth *h* is only of just such size as to admit the necessary amount of water as it is raised, and as it is situated only on one side, sticks, chips, and other light substances that float on the water are not liable to enter, as they would do if the mouth exposed a large surface or extended all the way round.

In the cylinder proper, A, plays a piston-head, E, whose rod or shaft G passes up through a water-packing seat, H, at the head of the cylinder. Both this piston and its shaft are peculiar in their construction. The piston is provided on opposite sides with induction-passages *i i'*, the former opening from the top and the latter from the bottom, so that in the downstroke the water will enter through *i* and in the upstroke through *i'*. The top of the piston above *i* and the bottom below *i'* are both closed by a floor, *k*, so that there is no escape for the water that enters in any direction, except inward through the center. On each side of the center are respectively ports formed by skeleton rims or frames I and I', preferably, but not necessarily, of inverted-arched form, as shown most clearly in Figs. 1 and 4. These skeleton frames are first cast or formed separately and

are then cast in the piston by being placed in the sand or mold. The position of the parts is such that a central angular space, *l*, is formed in the center of the piston, as shown clearly in Fig. 1, and in this space rests a simple leaf-valve, *K*, Fig. 5. This valve is also cast separate at first, similarly to the port rims or frames, and is provided with small journals *m m*. On being fixed or "rammed" in the sand, small pins *n n*, red lines, Fig. 5, are inserted over the tops of the journals to hold them in place during the process of casting. Thus arranged, the valve shuts against either port by the pressure of water against it on the opposite side. To illustrate: In the the downstroke, as indicated in Fig. 1, the pressure is through the port *I*, and consequently the water forces the valve against the port *I'*, shutting off the current in that direction and forcing it up through the hollow shaft of the piston, as will presently be described; but in the upstroke the valve is forced against the opposite port, *I*, as indicated by red lines, thus allowing the water to pass through in the opposite direction.

The piston is thus constructed without being formed of parts that may be disconnected—that is, the piston constitutes a whole in itself. Ordinary pistons are made of several parts, that are united by screw-threads, &c., which are thus not only costly in construction, requiring a good deal of fitting, but also, by being made of many detached parts, are liable to become unscrewed, disarranged, and are difficult to keep in order. In this device there is no possibility of disarrangement under ordinary circumstances. If the device is properly made, the whole will last till long use has made it worthless. In order to accommodate this peculiar construction of the piston, it is necessary that the port rims or frames and the valve should be cast in separate, for the sand cannot be so molded as to form these ports without constructing the piston of several members, which it is one object of this invention to avoid. When the port rims or frames are cast in, the contraction of the cast metal around them binds them securely in place, so that there is no danger of their disarrangement.

From the central space, *l*, of the piston the water passes upward into the shaft or rod *G*, which is made hollow or tubular for the purpose, and is attached to the piston as shown in Fig. 1. A hollow shaft has been before employed for raising water, but not, so far as is known, in combination with a double-acting force-pump. By this means the necessity of an independent elevating-pipe is dispensed with, thus greatly lessening the expense. Economy of space is also secured. It is sometimes the case that such a pump is fitted in a very deep well, which has to be bored to receive it. If an outside independent pipe is employed, the diameter of the bore has to be greater to receive it. Further, the same amount

of metal in the piston shaft or rod secures greater strength by being tubular than solid. By being situated centrally of the cylinder the piston-shaft insures the raising of the water with less resistance and friction than if it opened from one side of the center; and, lastly, the use of the hollow piston-shaft is a necessary consequence of the peculiar form and construction of the piston, for the elevating-pipe must rise and fall with the piston, which could not be the case if any other than a hollow piston-shaft were employed.

In Fig. 6 is shown a rear view of the pump, or that portion that attaches to the plank in the well. In casting, the patterns separate at the line marked *x x*. Therefore this being the case, round bolt-holes cannot be cast in flanges to the pump, for the reason that the patterns so arranged cannot be drawn out of the sand. To obviate this difficulty, lugs *o o* are cast to the cylinder, having notches or depressions *p p* formed therein, open at the outer end, that the patterns may be drawn out. Through these notches pass bolts, extending through the plank, having a nut and head at the extremities, as usual. This device is very convenient and forms a secure fastening, so that the pump cannot become detached under ordinary circumstances.

I do not claim simply a hollow shaft in which the water is raised by the up and down stroke of the same, as I am aware that the same has been before employed; but

What I claim as the invention of the said WALTER E. WATERS, and desire to secure by Letters Patent, is—

1. In combination with the hollow piston-shaft *G*, cylinder *A*, and side passage or pipe *B*, a piston *E*, so constructed that the water in both the up and down stroke will be forced centrally through the piston into the tubular shaft *G*, substantially as described.

2. Providing the piston *E* with the independent port-frames *I I'*, and the valve *K*, moving between them so as alternately to close each in the upward and downward strokes, substantially as herein specified.

3. The special construction and arrangement of the piston as a whole, the same being provided with the induction-passages *i i'*, ports *I I'*, valve *K*, and angular space *l*, substantially as described.

4. In combination with the pump-cylinder *A*, side passage or pipe, *B*, and valves *g g' f f'*, the elongated passage *D*, opening on one side upward by the mouth *h*, substantially as and for the purpose herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MARY P. WATERS,  
*Executrix.*

Witnesses:

ROBT. PIATT,  
KATE PIATT.