# W. E. Watters,

## Double-Acting Pump,

No. 32,260. Patented May 7, 1861.

Fig: 1.

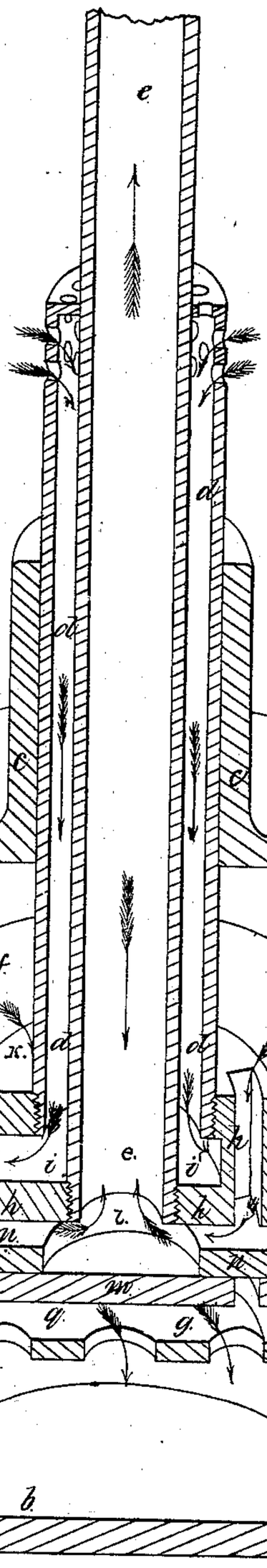



Fig: 3.

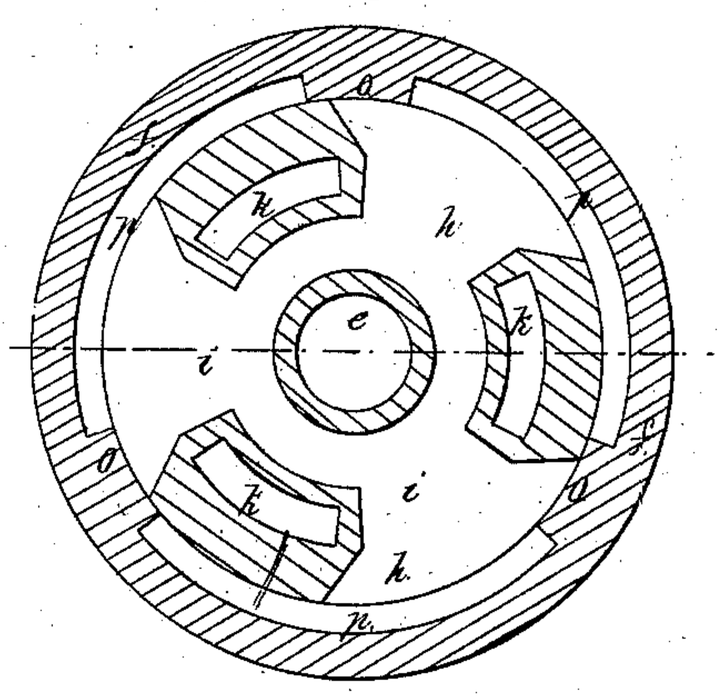
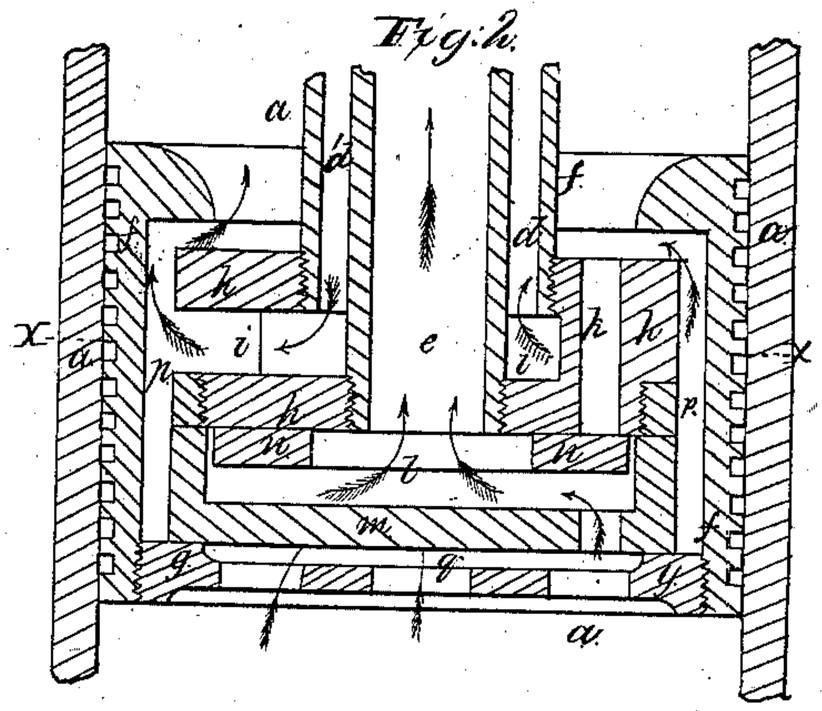



Fig: 2.




Witnesses:
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# UNITED STATES PATENT OFFICE.

WALTER E. WATTERS, OF EAST BEND, KENTUCKY.

## PUMP.

Specification of Letters Patent No. 32,260, dated May 7, 1861.

*To all whom it may concern:*

Be it known that I, WALTER E. WATTERS, of East Bend, in the county of Boone and State of Kentucky, have invented certain new and useful Improvements in Double-Acting Pumps; and I do hereby declare the following is a full and exact description thereof, reference being had to the accompanying drawings, of which—

Figure 1 is a perspective section of the pump, represented as during an upward stroke of the piston. Fig. 2 is a section of the piston and valves, shown as during a down stroke. Fig. 3 is a horizontal section of the piston at the line *x x* of Fig. 2.

The simplification of the pump has long been an object of attention to inventors, and one part after another has been successively dispensed with, or has been made to serve two or more purposes, and at the same time the efficiency of the apparatus has been increased, its durability prolonged, its manufacture facilitated and consequently its cost reduced.

I am aware that pumps have been heretofore made in which the piston rod was tubular, and made to serve as the discharge pipe, and also that valves of a peculiar construction within the piston have been made to act as discharge or eduction valves from either side of the piston.

My improvement possesses these features in an improved form, with the addition thereto of the induction or suction valves being also placed within the piston, and the suction pipe as well as the discharge pipe forming a portion of the piston rod. This arrangement enables me to dispense with the side pipe altogether, with all exterior valves, with both suction and discharge pipes other than those serving as the piston rod.

The pump cylinder is entirely closed, having no opening or aperture but the neck, through which the tubular piston rod passes. No packing or leathers are required to this pump its working parts being all metallic; and its construction is such that while at rest the valves allow the water to flow back in the pipe to the level of that in the cistern.

In the drawings (*a*) is the cylinder, having a bottom piece (*b*) screwed on, and at its upper end a neck (*c*) through which passes the tubular piston rod, composed of the suction or induction pipe (*d*), and the discharge or eduction pipe (*e*) of smaller size, and placed concentrically within it.

The pump is furnished with suitable means for securing it to the bottom of the well or cistern.

The piston is composed of several parts; viz: an external ring (*f*) having a number of grooves turned on its exterior, which being filled with water, prevent the passage of the water past the piston, without the necessity of any packing, or even a very close fit of the piston to the cylinder. It has an interior flange at its upper end, and at its lower end has a perforated disk (*g*) screwed into it. Within the ring (*f*) is the piece (*h*) formed of two disks, separated by the space (*i*), and having the walls of the vertical passages (*k*) the whole being cast in one piece. (See Fig. 3.)

To the upper disk of the piece (*h*) is screwed the suction pipe (*d*) communicating with the space (*i*) below; and having at its upper end a short distance above the neck (*c*) of the cylinder, a number of holes, through which the water enters. To the lower disk of the piece (*h*) is screwed the discharge pipe (*e*) opening to a chamber (*l*) inclosed by a cap (*m*) screwed to the under side of the piece (*h*). The passages (*k*) lead from the upper side of the piston to the chamber (*l*) which has in its bottom an equal number of holes of corresponding size and shape, opening to the lower side of the piston. Within this chamber is the flat ring valve (*n*) which alternately closes the passages (*k*) and the openings in the bottom of the cap (*m*). The pieces (*h* and *m*) together, in combination with the piston ring (*f*) form the suction valves, closing alternately against the flange above, and the bottom piece (*g*) below as valve seats. They are guided within the piston ring (*f*) by three or more ridges (*o*) which leave the passages (*p*) between them.

The operation is as follows: The water is drawn in through the holes in the upper end of the suction pipe (*d*) passing downward through it to the space (*i*); from thence it passes horizontally between the vertical passages (*k*), to the passages (*p*), and then either upward or downward according to the motion of the piston. During the up stroke as shown in Fig. 1 it passes downward to the space (*q*) and into the lower end of the cylinder through the holes in the disk (*g*). At the same time the water above the piston escapes through the passages (*k*) to the chamber (*l*) and from thence upward through the

discharge pipe (*e*). On reversing the motion of the piston the flow of water into the lower end of the cylinder, is intercepted by the piece (*m*) closing down on the disk (*g*); and the piece (*h*) simultaneously opening from its contact with the flange of the piston ring (*f*), the water which had entered the space (*i*) as before described now passes by the passages (*p*) to the upper end of the cylinder. The water below the piston now presses upward through the apertures in the piece (*m*), and raises the ring valve (*n*) to contact with the piece (*h*) which closes the passages (*k*) and the water is compelled to ascend the discharge pipe (*e*), thus furnishing a continuous stream. When at rest both valves descend and a free passage is then open between the suction and discharge pipes and the upper end of the cylinder, which allows the water in the discharge pipe to flow back out of reach of frost. The discharge pipe is continued upward to the desired place of discharge, where it is formed into a spout. A suitable brake or lever for working the piston is there attached to it; and if required an air chamber may be applied to it at any part of its length. A tubular piston rod possesses the advantage of greater stiffness for the same weight of metal than a solid rod can have.

What I claim as new and for which I desire Letters Patent, is—

1. A double acting pump, its cylinder having no other opening to its interior than that through which the tubular piston rod works, and having no valves other than those contained within the piston itself.

2. The induction pipe, inclosing the discharge pipe, both being attached to the piston (or a part thereof) and together serving the purpose of the piston rod, substantially as described.

3. The double acting ring valve (*n*) for alternately closing the passages (*k*) and the apertures in the cap (*m*) in combination with the induction pipe, substantially as described.

4. Forming the induction valves by the pieces (*h* and *m*) closing respectively against the internal flange of the piece (*f*) and the disk (*g*) substantially as described.

5. The several parts composing the piston and its valves, viz: the external ring (*f*), the perforated disk (*g*), the piece (*h*) with its spaces and passages, and its connection with the suction and discharge pipes, and the flat double acting valve ring (*n*) in combination for the purposes, and substantially as described.

WALTER E. WATTERS.

Witnesses:
EDWARD EVERETT,
THOS. W. MACFALL.