2 Sheets—Sheet 1.

A. J. TYLER.

PUMP.

No. 188,443. Patented March 13, 1877.

Fig. 1.

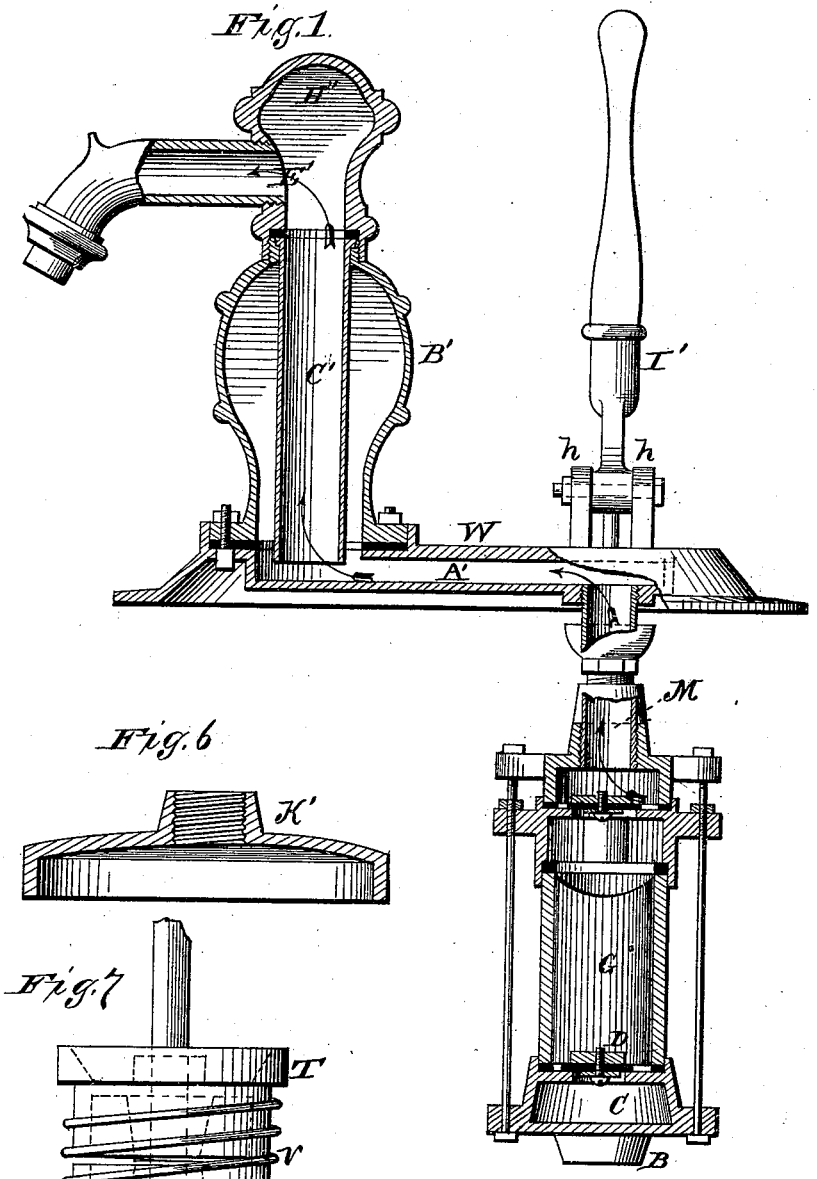

Fig. 6

Fig. 7

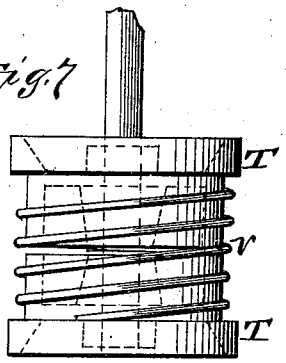

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Fig. 2

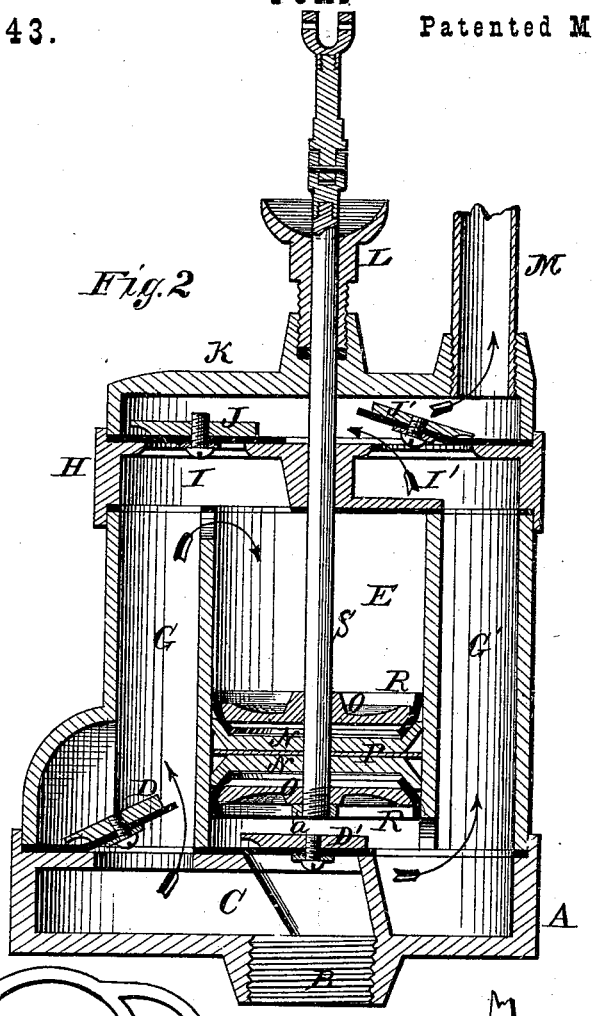


Fig. 3.

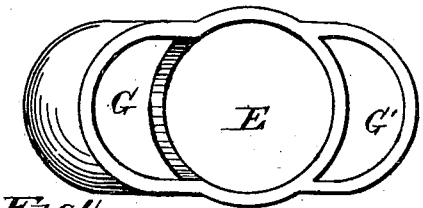


Fig 4

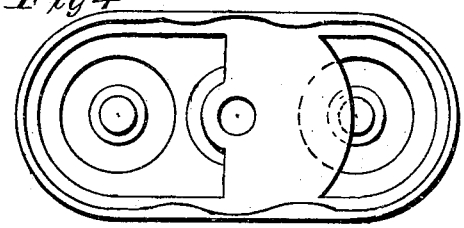
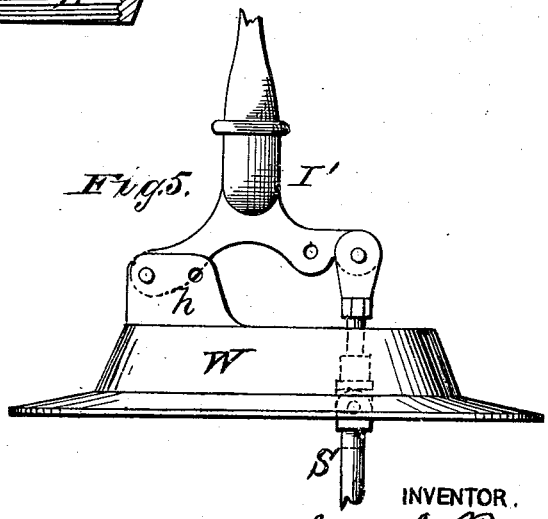


Fig. 5.



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UNITED STATES PATENT OFFICE.

AARON J. TYLER, OF BUFFALO, NEW YORK.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **188,443**, dated March 13, 1877; application filed August 24, 1876.

To all whom it may concern:

Be it known that I, AARON J. TYLER, of Buffalo, in the county of Erie, and in the State of New York, have invented certain new and useful Improvements in Pumps; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a pump, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a vertical section through the entire pump. Fig. 2 is an enlarged vertical section through the cylinder and water-passages. Figs. 3, 4, and 5 are detailed views of detached parts of the pump. Figs. 6 and 7 show modifications of the valve-chamber and piston.

A represents the bottom head of my pump, with inlet B in the center leading into a passage, C. In the top of this passage are two valves, D D′, as shown. E is the pump-cylinder, provided with water-passages G G′ on opposite sides, and extending the entire height of the cylinder. The valve D opens into the passage G, while the valve D′ opens into the cylinder E. H is the top head of the pump, with two passages, I I′, having valves J J′, respectively.

It will be seen that all the water-passages are in the top and bottom heads and in the side passages attached to the cylinder; and by the construction of said passages more capacity is obtained.

The cylinder E need not be any longer than the length of the stroke required and the depth of the piston, as the pump receives and delivers its water over the ends of the cylinder. The top valves are placed on top of the top head H, directly above the cylinder and water-passages, one or more on either side of the piston-rod, which passes directly through the center of the top head. These valves J J′ open a valve-chamber, K, as shown. In this valve-chamber there is always a water-pressure; consequently the pump cannot take in air on the downstroke of the pump-piston, and the water is discharged in a direct line from the cylinder. This is of decided advantage, as there has been and is a great deal of trouble from pumps of this class taking in air on the downstroke of the piston, and there have been many expedients resorted to to stop it, such as having an extra cylinder around the piston-rod to be filled with oil or water. But this is expensive. It will be noticed that my packing-box L does not communicate with the cylinder at all, and therefore allows of this water-pressure. M is the outlet-pipe from the valve-chamber K.

In Fig. 6 I have shown a valve-chamber, K′, to be used when it is desired to run the piston-rod through the pipe, which in some cases I may want to do.

The plunger or piston is constructed of four saucer or cup shaped pieces, N N and O O. The cups N N are as large as the cylinder, and the other two, O O, are as much smaller all around as the thickness of the leather which is used for the same. The cups N N are placed with their bottoms together, with a washer, P, between them. The leathers R R are placed in the cups N N, and the cups O O placed on the outside of them. The rod S passes through the center of the plunger, and the nut *a*, screwed on the end of the rod, fastens the parts together. The center washer P is intended to just fit the cylinder, so that when the leather becomes worn by long use it will still be an effective plunger, as the water retained in the cavities will form a water-packing, and work tight. The effectiveness of this plunger can be greatly enhanced by putting in more of these washers with smaller ones between.

In Fig. 7 I have shown a plunger intended to be used for pumping hot water or acids, or other liquids, where the other plunger cannot be used. This plunger consists of two shouldered and recessed heads, T T, with a coil-spring, V, surrounding them between the shoulders. The water working in this coil-spring forms a water-packing. The lower half of this plunger is always full of liquid, so that, should the plunger lose its priming, as

soon as the piston was worked the liquid would ooze out between the two heads, and, filling the spring, would prime itself. When this piston is used I shall also use metallic valves.

The pump proper, as above described, when used in a well or cistern, will be placed far enough below the platform to be out of the way of frost.

The top of the pump is provided with a plate, W, which receives the force-pipe M, and conducts the water therefrom through a passage, A′, to the air-chamber B′, which is bolted or screwed to said platform-plate. The spout C′ is screwed on the top of the chamber B′, and holds down the inside pipe E′ by the packing *b* pressing against the end of the same. This pipe has a flange, *d*, on its upper end, which fits into a shoulder, and is packed, as stated. Above the spout is a small reservoir, H′, to hold a small supply of water, whereby the discharge is made steadier. On the plate W are cast ears *h h*, in which the lever I″ is pivoted. These ears are provided with several bolt-holes, for the purpose of changing the fulcrum, as required. The handle or lever I′ has also corresponding holes for the attachment of the piston-rod S, because when one is changed the other must also be. This is to get more purchase in very deep wells.

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

1. The combination of the bottom head A with its passages and valves D D′, the cylinder E, with side passages G G′, the top head H, with chambers I I′, and two or more valves, J J′, and the valve-chamber K, extending over the cylinder and both side passages, all substantially as and for the purposes herein set forth.

2. The plunger herein described, consisting of the four cups N N and O O, the leathers R R, and one or more center washers, P, substantially as and for the purposes herein set forth.

3. The combination of the top plate W with passage A′, air-chamber B′, with interior pipe C′, and the spout E′ with reservoir H′, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of August, 1876.

AARON J. TYLER.

Witnesses:
C. L. EVERT,
GEO. CASTLES.