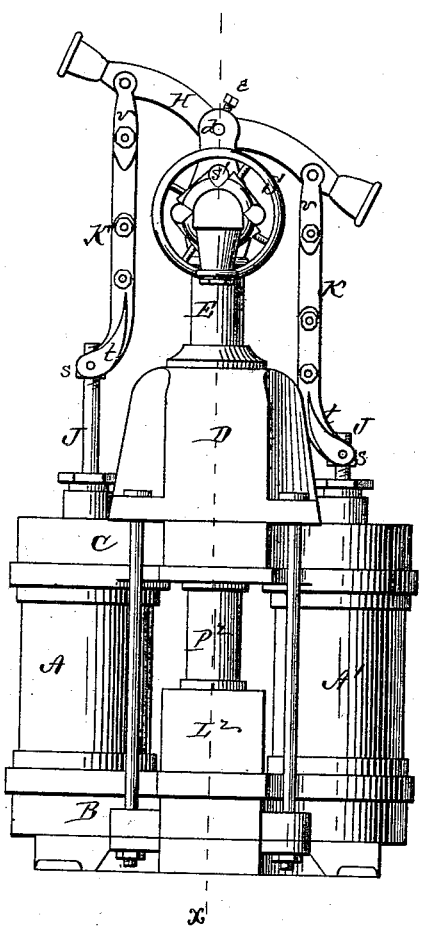
2 Sheets--Sheet 1.

# H. TYLER.

## Pump.

No. 167,366. Patented Aug. 31, 1875.

*Fig. 1.*




WITNESSES

Henry N. Miller

C. L. Emerson

INVENTOR

Hiram Tyler.

per Alexander Mason

ATTORNEYS

# H. TYLER.
## Pump.

No. 167,366. Patented Aug. 31, 1875.

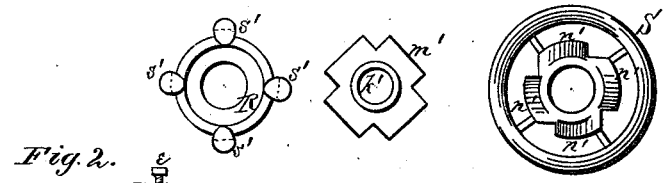


Fig. 2.

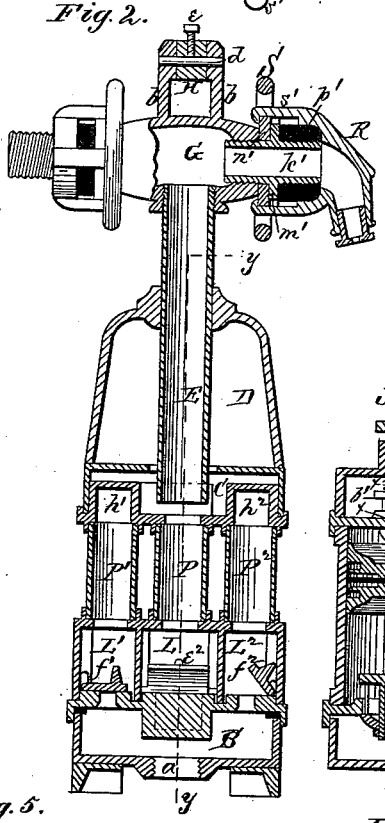


Fig. 3.

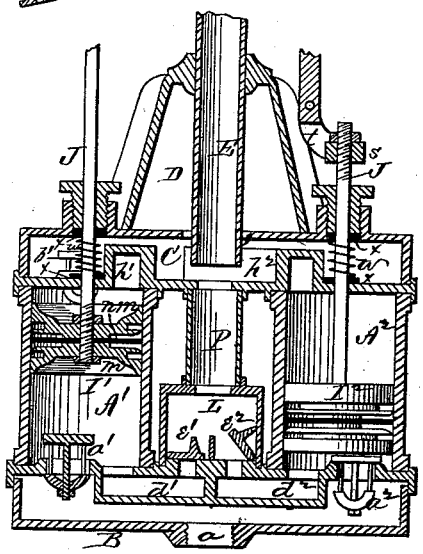


Fig. 4.

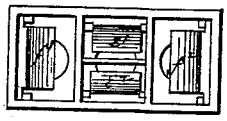


Fig. 5.

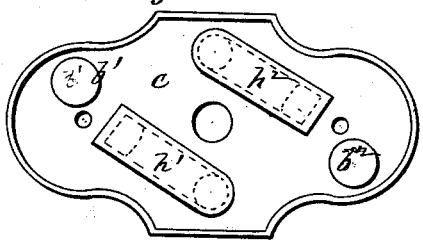
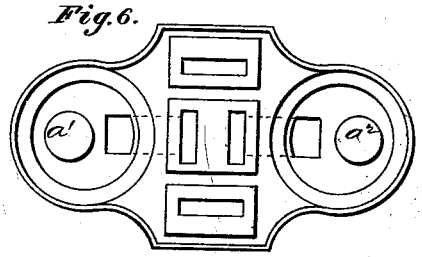


Fig. 6.



WITNESSES

Henry N. Miller
C. L. Everth

INVENTOR

Hiram Tyler
per Alexander Thomson
ATTORNEYS

# UNITED STATES PATENT OFFICE.

HIRAM TYLER, OF GENESEO, NEW YORK.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **167,366**, dated August 31, 1875; application filed February 6, 1875.

*To all whom it may concern:*

Be it known that I, HIRAM TYLER, of Geneseo, in the county of Livingston 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 double-acting force-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 side elevation of my machine. Fig. 2 is a vertical section of the same through the line *x x*, Fig. 1. Fig. 3 is a section through the line *y y*, Fig. 2. Figs. 4, 5, and 6 are detailed views of certain parts thereof.

$A^1$ and $A^2$ represent the two pump-cylinders placed upon a chamber, B, having the central aperture *a* in its bottom for the admission of water therein. On top of the cylinders $A^1$ $A^2$ is another chamber, C, on top of which is the air-chamber D, and through said air-chamber passes the vertical outlet-pipe E. The lower end of this pipe E extends about half-way down into the chamber C, and on the upper end is secured a T-outlet, G. On top of this outlet are two arms, *b b*, between the upper ends of which the operating-lever H is pivoted, by means of a bolt or pin, *d*, passed through the arms and lever, and a set-screw, *e*, is passed through the top of the lever to hold the bolt. This dispenses with the nut generally used on the end of the bolt, which is apt to work loose, and when the bolt or pin becomes worn it can easily be taken out and replaced. The cylinders $A^1$ $A^2$ are connected with the chamber B by valves $a^1$ $a^2$, respectively, and with the chamber C by valves $b^1$ $b^2$. These valves are all constructed alike, and consist each of a top disk, *f*, connected, by a central bolt, *h*, with a spider, *k*, and provided with guide-rods *i*, forming a cheap, yet durable and effective, valve. In the cylinders $A^1$ $A^2$ are placed the pistons $I^1$ $I^2$, respectively, constructed each of two cups, *m m*, with offsets or shoulders on their under sides, as shown in Fig. 3, and with circumferential grooves. The two cups are placed with their bottoms toward each other, and one or more rubber disks, *n*, inserted between them. The parts are then fastened together by the piston-rod J being passed centrally through them, and a nut screwed thereon on each side of the piston. The spaces between the disk or disks *n* and the cups *m*, and the grooves in said cups, form water-chambers, so as to pack the piston by water as well as by the rubber disk or disks *n*. The piston-rods J J pass up through the chamber C, and are connected to the lever H, one on each side of the pivot. The upper end of each piston-rod J is screwed in a nut, *s*, which is journaled in the ends of two curved arms, *t t*, which are fastened to a bar, K, and the upper end of said bar attached to the lever by suitable link-couplings *v v*. The rods J pass through suitable stuffing-boxes in the top of the chamber C, and to prevent any air from being drawn in with the rods suitable packing-disks *x x* are placed on each rod J, within the chamber C, and said disks are held against the top and bottom of said chamber by means of a spiral spring, *w*, placed between them on the rod. By this means the piston-rod is perfectly packed to prevent the admission of air. Between the two cylinders $A^1$ $A^2$ is placed a valve-box, divided by vertical partitions into one center compartment, L, and two end or side compartments, $L^1$ $L^2$. The center chamber L is, by passages $d^1$ and $d^2$, connected, respectively, with the lower ends of the two cylinders $A^1$ and $A^2$, and said passages are in the chamber L provided with valves $e^1$ and $e^2$, opening upward therein. The side chambers $L^1$ $L^2$ connect directly with the bottom chamber B, and are provided, respectively, with upward-opening valves $f^1$ and $f^2$, as shown in Fig. 2. The center chamber L is, by a cylinder, P, connected with the top chamber C directly below or opposite to the lower end of the discharge-pipe E, and on top of the end chambers are other cylinders, $P^1$ $P^2$, which are connected at the top with the upper ends of the cylinders $A^1$ $A^2$, respectively, by means of the passages $h^1$ $h^2$.

The operation of my pump is as follows: Supposing the plunger $I^1$ is ascending and the plunger $I^2$ descending, the latter plunger forces the water below it in the cylinder $A^2$ through the passage $d^2$, opening the valve $e^2$, the valve $a^2$ in the bottom of this cylinder closing by the pressure of water upon it. The water passes into the chamber L, and up through the cylinder P into the chamber C, and from thence through the outlet-pipe E. At the same time this plunger $I^2$, by suction, opens the valve $f^2$ in the chamber $L^2$, so that the water will be drawn up from the chamber B, through the chamber $L^2$, cylinder $P^2$, and passage $h^2$, into the top of the cylinder $A^2$, above the plunger. The ascending plunger $I^1$, by the pressure of water, closes the valve $f^1$ in the chamber $L^1$, and forces the water above it through the valve $b^1$, into the chamber C, and out through the outlet-pipe E. At the same time this plunger $I^1$ opens the bottom valve $a^1$, drawing the water up from the chamber B directly into the lower part of the cylinder. By reversing the motion of the plungers the action of all the parts is of course reversed.

In starting the pump the chamber C is an air-chamber, but it soon becomes filled with water, and then acts as a water-reservoir.

It will be noticed that each of the cylinders $A^1$ $A^2$, with their respective valves, passages, suction-cylinder and discharge-cylinder, forms a complete pump of itself, so that for ordinary work one of the piston-rods may be detached from the lever H, and the other piston or plunger only operated. The detached piston-rod can easily be attached again when required.

In connection with my pump I use a nozzle, R, curved as shown, and attached to one end of the T-outlet G in the following manner: A short pipe, $k'$, is provided with screw-threads on both ends, and with a square flange, $m'$, around the center, said flange having square notches cut in the corners. One end of this tube is screwed into the T-outlet G, a wheel, S, being first placed on said pipe or tube, so as to be between the end of the outlet and the flange $m'$. The hub of this wheel is formed with cams $n'$, as shown. On the outer end of the tube $k'$ is placed a rubber washer or collar, $p'$, and the inner end of the nozzle, R, is placed over the same. This nozzle is provided with four inward-projecting hooks, $s'$, which pass through the notches in the flange $m'$, and between the cams $n'$. By now turning the wheel S these cams act on the hooks $s'$ to draw and hold the nozzle tightly in place. By this means the nozzle is easily and quickly coupled to the outlet, and can be changed to point in any direction, as required.

The same device may be used for a hose-coupling by substituting a straight tube for the curved part of the nozzle.

When either end of the T-outlet G is required to be closed a rubber cap is placed on the outer end of the tube $k'$, in place of the washer or collar $p'$.

The above-described hose-coupling being the subject of a separate application, I make no claim to such under this specification.

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

1. In combination with a pump, substantially as herein described, the pump-plunger, consisting of the cups $m$ $m$, provided with the grooves and shoulders, as described, and one or more rubber disks, $n$, placed between them, substantially as and for the purposes herein set forth.

2. The combination, with the cylinders $A^1$ $A^2$ and chambers B C, of the valve-chambers L $L^1$ $L^2$, cylinders P $P^1$ $P^2$, passages $d^1$ $d^2$ and $h^1$ $h^2$, and the various valves, as described, substantially as and for the purposes herein set forth.

3. The packing-disks $x$ $x$ and spiral spring $w$, arranged around the piston-rod J within the chamber C, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of February, 1875.

HIRAM TYLER.

Witnesses:

WILLIAM L. BRAMHALL,

C. M. ALEXANDER.