W. H. T. Clark,

Pump.

No. 90,080. Patented May 18. 1869.

Fig: 1.

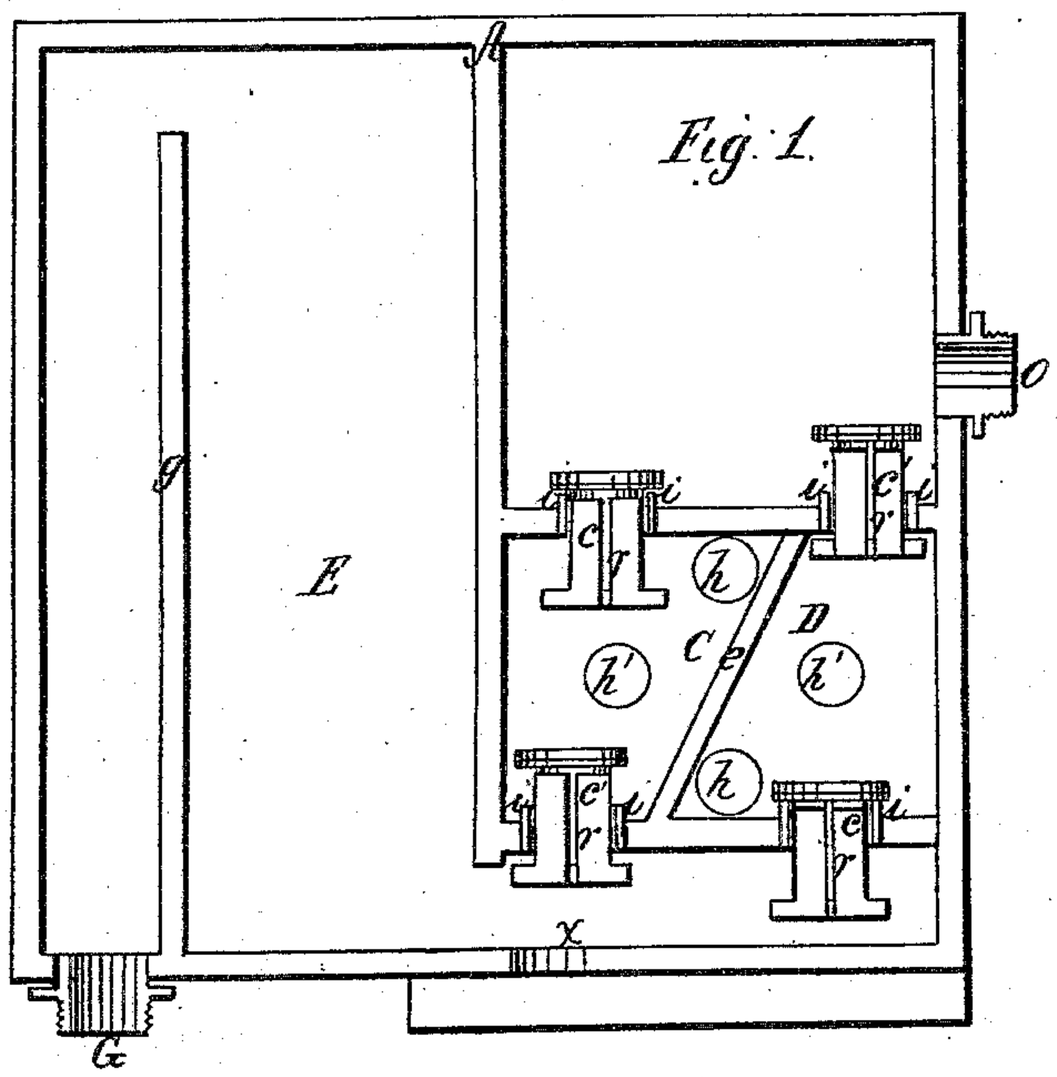


Fig: 2.

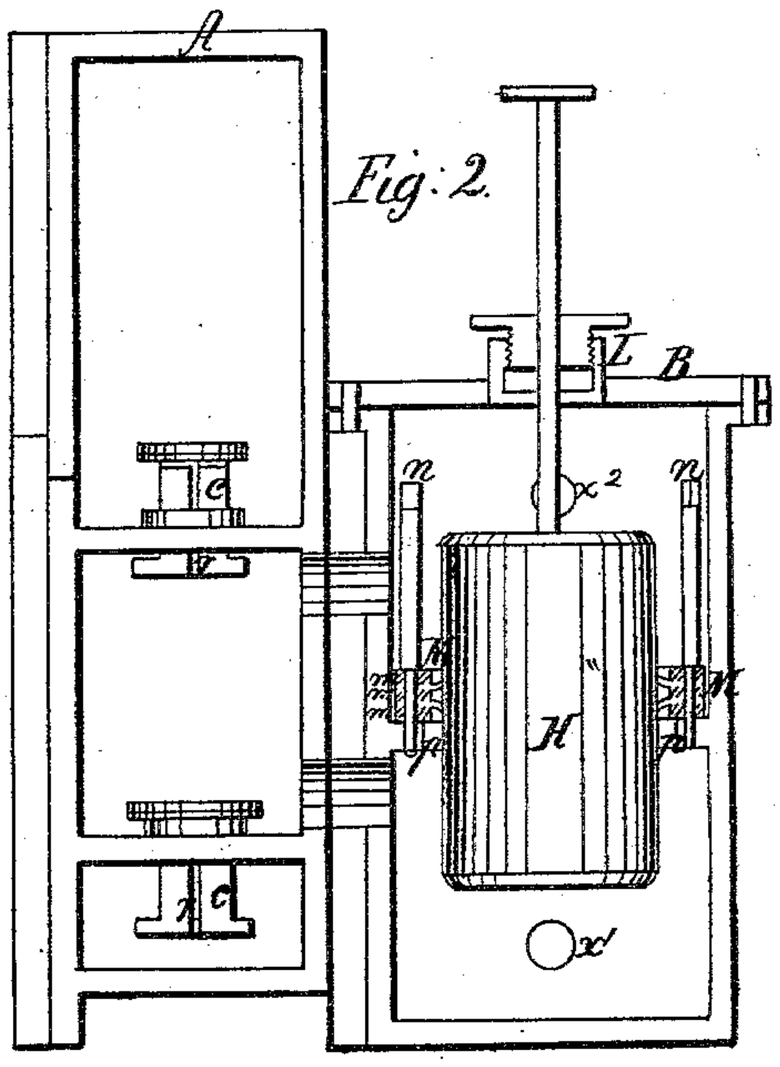


Fig: 4.

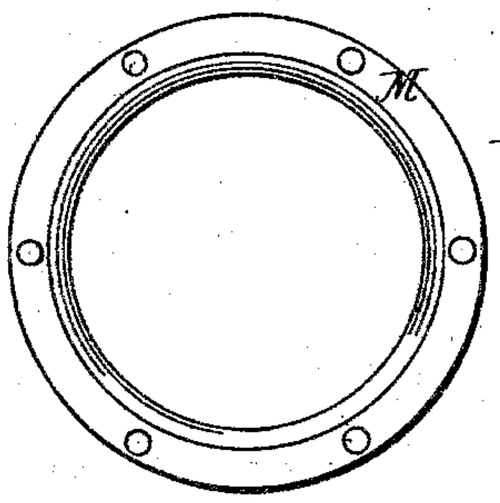


Fig: 3.

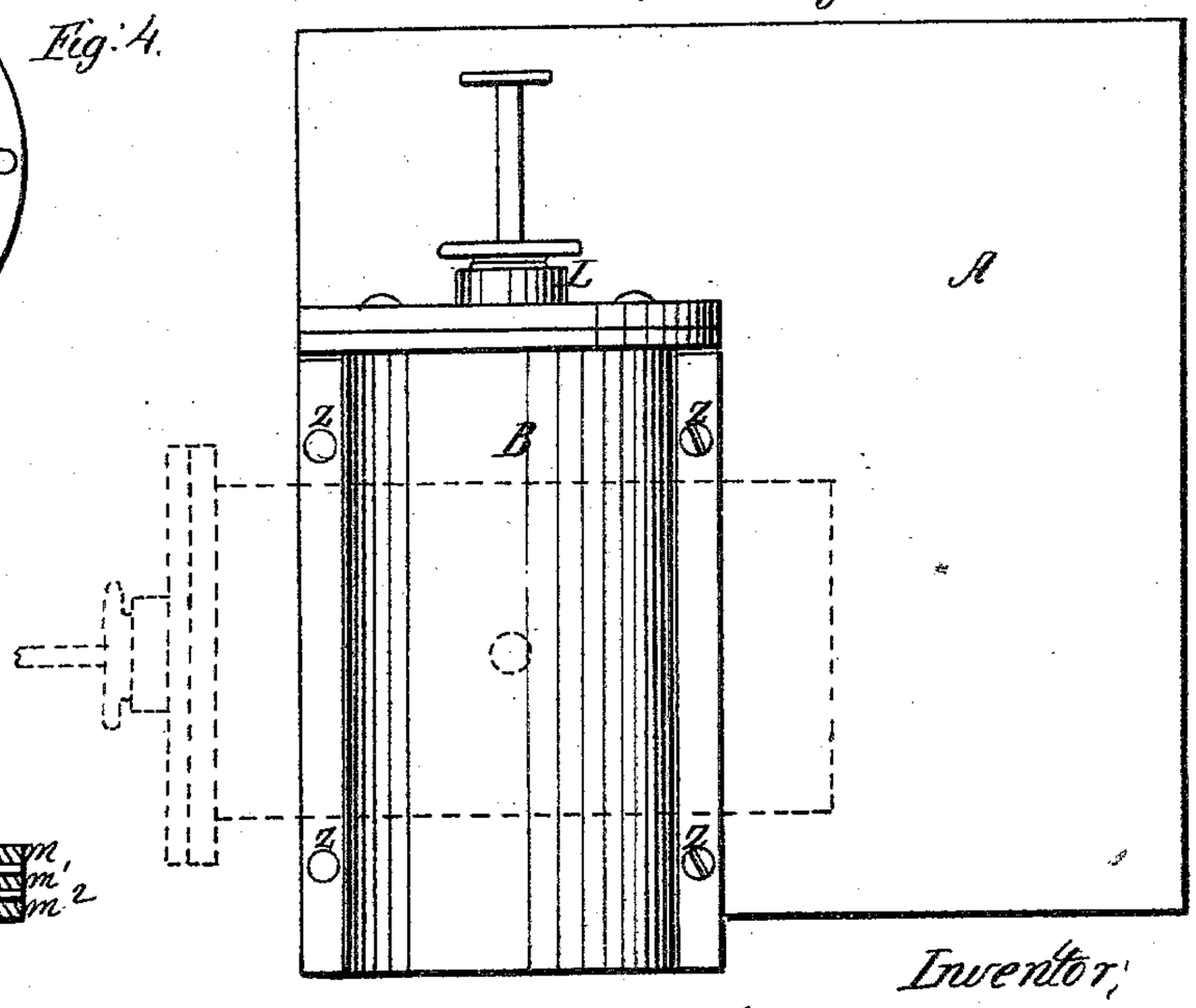
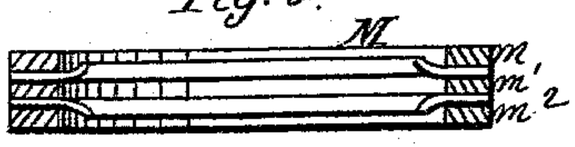


Fig: 5.



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Letters Patent No. 90,080, *dated May* 18, 1869.

IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM H. T. CLARK, of the city and county of San Francisco, State of California, have invented an Improved Double-Acting Pump; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention without further invention or experiment.

The object of my invention is to provide an improved double-acting pump, which can be used either horizontally or perpendicularly, as desired, and is so arranged, by means of chambers, that the water will always stand at a certain height in the pump.

The construction of the pump is such, that any sand that may accumulate in the water-chamber will not be drawn up through the valves, and if it should, the valves are so arranged, on raised seats, that it cannot in any way interfere with their operations.

The valves themselves are perculiar in their construction, the guides being arranged so that it is impossible for the valves to get out of order and leak.

The plunger, or piston, moves in a peculiar packing, which prevents any sand from passing it, and thereby cutting it, and may be easily renewed when desired.

To more fully illustrate my invention, reference is had to the accompanying drawings, forming a part of this specification.

Figure 1 is a view of the valve and water-chambers.

Figure 2 is a sectional elevation, showing the cylinder and portion of the valve-chamber.

Figure 3 is a view of the cylinder.

Figures 4 and 5 are views of the packing-rings.

Similar letters of reference in each of the figures indicate like parts.

The pump is made in two parts, A and B.

The part A is simply a box containing the valve-chambers C and D, water-chamber E, and air-chamber F, and may be cast in one piece.

G is the induction-pipe, connecting with the source of supply.

g is a diaphragm, or partition passing across the box A, leaving a space at the top, through which the water may pass into the chamber E.

This chamber will be kept full of water continually, to the height of the partition *g*, except when beginning to operate the piston, when the water in the chamber is drawn off, until a vacuum is produced in the chamber E, causing the water to rise up into the chamber, flowing in a constant stream, while the piston is operated, and continuing to do so until the vacuum is satisfied.

The chamber E extends beneath the valve-chambers.

The valve-chambers C and D are divided by a partition, *e*, in such a manner as to leave two ports in each chamber, so that the cylinder may be changed from a perpendicular to a horizontal position, the two opposite ports, *h*, communicating with the cylinder when it stands perpendicular, and the two, *h' h'*, when it is horizontal.

The valves, *c c c' c'*, rest upon a raised valve-seat, *i i i i*, which prevents any sand that may accumulate in the valve-chamber, from interfering with the valve.

The guides of the valves are three or more wings, which radiate from the central line, and extend far enough from the centre to work easily, as shown.

This form of guide insures a true action of the valves, and sitting, as they do, upon a raised seat, they never fail to act.

The caps of the valves are screwed into the guides, at the top, and furnished with a suitable packing.

The part B is the cylinder, or barrel, inside of which the piston, or plunger H, moves.

The rod of this piston moves through a stuffing-box, at L, for the purpose of keeping the cylinder water-tight.

This cylinder may be made to act horizontally, by removing the screws *z z z z*, and turning it as shown in red, fig. 3, the screws fitting in either position, the two ports *h h* connecting with the cylinder when horizontal.

The valve-chamber and cylinder are faced so as to fit perfectly water-tight, and when the cylinder stands perpendicularly, the two ports *h' h'* will be closed.

If the cylinder lies horizontally, the two ports *h h* are closed, so that one pair acts for a vertical position, and the other pair for a horizontal position of the cylinder.

The piston H is a long cylinder, and moves up and down inside of the packing-rings, M.

This ring is composed of three metallic rings, *m* m^1 m^2, between each two of which is placed a packing of leather, the centre ring fitting the piston so as to prevent friction, and keep it in line.

The leather which projects inside of the ring from between the upper rings is turned up, and that which projects from between the lowest ones is turned down, so that the piston is always moving against the one and with the other, the lower one being free, and presenting no resistance on an upward stroke; and the upper one, on a downward stroke, freeing itself at each stroke of any sand that may attempt to pass, and preventing it from cutting the packing.

The packing-ring M is secured to a flange inside of the cylinder, by means of long screws, *n n*, a packing interposing between the ring and flange, and can be easily removed when it is desired to renew the packing.

The piston H being put in motion, the water rises up the induction-pipe G, and falls over the partition *g*, into the chamber E, until it becomes filled to the top of the partition. The water then rises through

the lower valves into the valve-chambers C and D, and passes through the ports *h h* into the cylinder. Then, in an upward stroke of the piston, the water in the chamber D rushes into the cylinder, at the lower port *h*, raising water through the lower valve *c*, while that in the cylinder, above the packing-rings, is forced, by the rising piston, into the chamber C, and through the upper valve *c*, into the air-chamber F, from whence it is discharged, through the eduction-pipe O.

By this construction, the interior of the pump is continually submerged in the water, while any sand that may accumulate in any of the chambers can do no damage, but can be easily cleared, by removing the plug X, directly beneath the chamber E, when the water in the chamber will carry it off.

Similar plugs, X^1 X^2, in the cylinder, may also be removed for the same purpose, one being placed above, and the other below the packing-rings.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The arrangement of the partition *g*, chamber E, valve-chambers C and D, and air-chamber F, within the part A, substantially as described.

2. In combination with the above-named parts, arranged as claimed, the valves *c* and *c'*, provided with the raised seats *i*, and radiating-guides *r*, substantially as specified.

3. The arrangement of the ports *h h* and *h' h'*, in relation to the diaphragm *e*, and with reference to the cylinder B, whereby said cylinder may be attached to the part A, either in a vertical or horizontal position, substantially as set forth.

4. The compound packing-ring M, fastened to the interior flange *p*, together with the elongated plunger H, the whole constructed and arranged substantially as herein described.

In witness whereof, I have hereunto affixed my hand and seal.

WM. H. T. CLARK. [L. S.]

Witnesses:

J. L. BOONE,

DON L. SWETT.