

119,003.

Patented Sep. 19, 1871.

Henry M. Bartlett.

WATER METER.

Fig. 1.

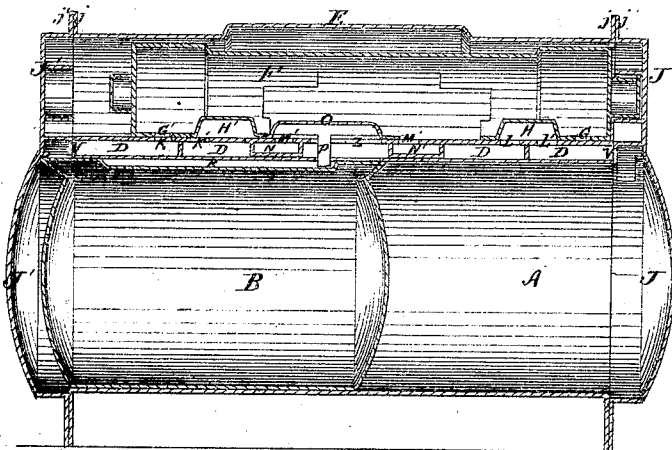


Fig. 2.

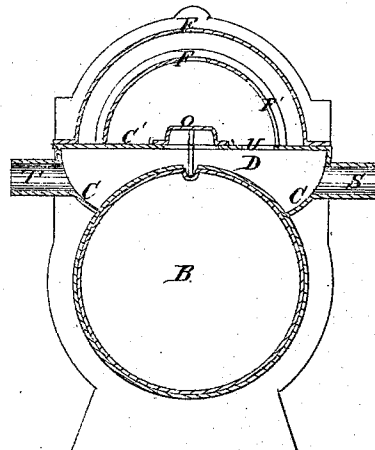


Fig. 3.

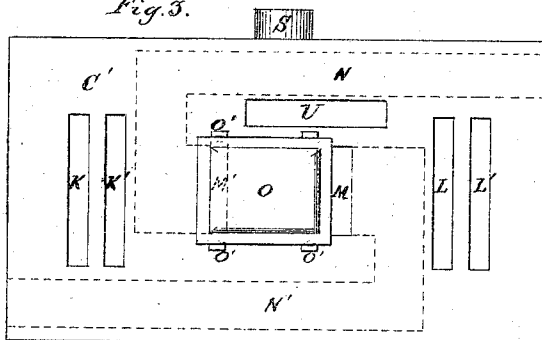


Fig. 4.

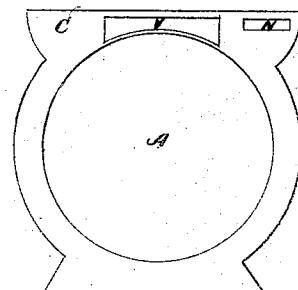


Fig. 5

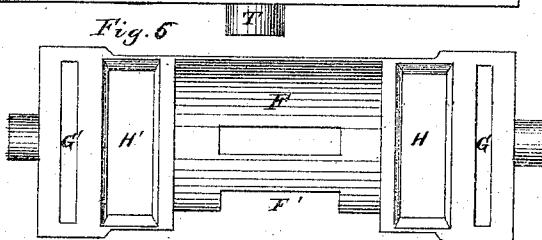
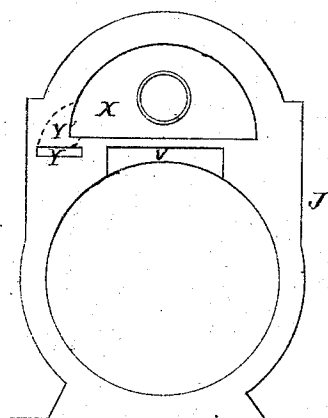


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY M. BARTLETT, OF SOUTH DEDHAM, MASSACHUSETTS.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 119,003, dated September 19, 1871.

To all whom it may concern:

Be it known that I, HENRY M. BARTLETT, of South Dedham, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Water-Meters, of which the following is a specification:

Figure 1 is a longitudinal vertical central section of my invention. Fig. 2 is a transverse vertical central section. Fig. 3 is a plan view with the upper portion and ends removed. Fig. 4 is an end elevation of Fig. 3; Fig. 5, an inverted plan view of the upper reciprocating valve; Fig. 6, a side elevation of one of the end pieces; and Fig. 7, a sectional and side elevation, showing a modification of the upper reciprocating valve.

This invention relates to that class known as reciprocating water-meters; and it consists mainly of an air-tight floating piston, and a peculiar arrangement of ports and valves whereby a perfect reciprocal motion is obtained, which is suitably imparted to registering devices.

The details of construction and method of operation will be more fully described hereinafter.

In the drawing, A represents a cylinder, in which is a cylindrical air-tight piston, B, which moves freely therein, and is a little more than half its length. Above the cylinder A is a casing, C, having a plane horizontal upper surface, C', between which and the cylinder is a space, D, which is divided into different compartments. E represents a semi-cylindrical cap, which covers the surface C' of casing C, which cap has an enlargement in the middle. Within the cap E, and resting on the surface C', is a semi-cylindrical valve F, the bottom of which is provided with the ports G G' and the bridge-shaped recesses H H'. Between these latter the lower portion of valve F is open. The ends of valve F fit closely in the ends of cap E, but between these ends the periphery of the valve is made smaller, and cut away, as shown at F', in order to leave a greater space for water between itself and cap E, which, as before mentioned, is enlarged at this part, and this additional water-space affords sufficient convergent pressure on the outer periphery of the valve to counteract the upward pressure of water on the recesses H H' and through ports G G', which convergent pressure is exerted only over the recesses H H' and sufficient additional space adjoining to balance the width of ports G G'. J J' represent end pieces or caps, which cor-

respond in shape to the cross-section of cylinder A and cap E, which latter are constructed separately, and connected by bolting together the flanges j j' on the ends of said cylinder and cap and on end caps J J'. K K' and L L' represent ports in the surface C' of casing C, which ports connect with ports G G' and recesses H H' of valve F. M M' represent similar ports in surface C', which communicate, through passages N N', with the recesses X of end pieces J J' through ports Y and passages Y', (as shown in dotted lines in Fig. 3.) O represents a valve, which slides between guides O' over ports M M', and is so arranged as to alternately close one of the same from the top and leave the other open, and alternately connect each with the channels N N' from below. The valve O is actuated by the piston B, a projection, P, from the former entering a groove, R, in the latter, by which means the valve is moved at every stroke of piston B a sufficient distance to reverse its position with relation to ports M M'. S represents the induction-pipe and T the eduction-pipe, both of which enter casing C at opposite sides of the machine. U represents a port in the surface C', through which the water passes from the induction-pipe S. V V represent orifices in the ends of casing C, which orifices connect the interior of the same, through the end caps J J', with the ends of cylinder A.

The operation of my invention is as follows:

When the parts are in the position shown in Fig. 1 the piston B is at the extreme end of its course, having been driven thither by the water entering cylinder A from the opposite end, as will be explained hereafter, the space in said cylinder not otherwise occupied being filled with water. It will be observed that the valve F is in contact with the opposite end of the meter from piston B, and that the port K' is closed while the ports K and L L' are open, the two latter being connected by the bridge-shaped recess H. The port M' is closed from above by valve O while the port M is open. The incoming water through pipe S, passing upward through U, (the latter being always open,) fills the interior of cap E surrounding valve F, passes through port M, passage N', and channel Y' in end piece J, and impinges against the end of valve F, which it forces into the position shown; then passing through valve F over bridge H', through ports G and K into space D, from whence it flows through orifice V

into the lower part of end cap J', where it presses against piston B and forces the same toward the opposite end of the cylinder. This motion of piston B of course forces the water which had previously accumulated in the cylinder out of the latter and upward, through end cap J and orifice V, into space D, and from thence passing through the siphon-like passage formed by ports L L' and recess H, returns again to space D, from whence it finds egress through the eduction-pipe T. Meanwhile the piston B, in completing its course, reverses the position of valve O, covering port M from above, and connecting the channel N' with the exhaust-opening Z, said valve being hollow within. It will be seen that the port M' is now open and the water from port U immediately passes through the same and passage N to the opposite end of the valve F, against which it bears, and forces it back toward the end cap J', the water between said cap and the end of the valve passing out through the channel N' and under the valve O, out at the exhaust-opening Z. This movement of valve F connects ports K K' by means of bridge H', closes port L, and connects ports G and L', through which latter the water rushes, over bridge H and down through orifice V, into the end cap J, and pressing against the piston causes it to move back to the opposite end of the cylinder, thereby forcing the water accumulated in said end up through ports K K' and bridge H out at the eduction-pipe T. The

operation is thus continued, every passage of piston B reversing the position of valve O, thus causing a current of water to bear on one end of valve F forcing it in the opposite direction, and opening a passage from the end of the cylinder containing the water to the eduction-tube and maintaining a perfect reciprocation of valve O, which is suitably imparted to registering devices.

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

1. The valve O, in combination with the channels N N', ports M M', valve F, and piston B, substantially as described.

2. The valve F, provided with the ports G G' and recesses H H, in combination with the surface C' of casing C, having ports K K' and L L', substantially as described.

3. The arrangement of valve-piston F, valve O, and piston B, so that water received through induction-pipe S, and passing through ports L L' and K K' operates the piston B, which actuates valve O, the latter, in turn, actuating valve-piston F, in the manner substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

Witnesses: HENRY M. BARTLETT.

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(25.)