



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN PISTON WATER-METERS.

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*To all whom it may concern:*

Be it known that I, ALVAH C. AUSTIN, of Oakland, Alameda county, State of California, have invented an Improved Water-Meter, of which the following is a specification:

This invention consists in the combination of two cylinders, which are alternately filled and emptied by means of a peculiar valve arrangement, automatically worked by the movement of a piston passing back and forth within each cylinder as the water enters or escapes from one end or the other. The usual device is applied for registering the amount of water passing through the meter.

In the accompanying drawings, Figure 1 is a longitudinal section of my invention; Fig. 2, a transverse section taken through the line *y y*; and Fig. 3, a transverse section taken through the line *z z*.

In Fig. 1, A A' are two cylinders, which are arranged to set one in advance of the other. Between them is placed the valve-chamber B, also cylindrical in form, within which the two semicircular valves C C' are accommodated. D D' D'' D''' are four passages, which lead from the valve-chamber to each end of the two cylinders, the water flowing in or out of these passage-ways as the position of the valves C C' closes or opens the passage-ways to the supply or exhaust, similarly to the common slide-valve arrangement of a steam-engine. E E' are the pistons or hollow plungers, which are forced from one end to the other of their respective cylinders by the inflowing and outflowing of the water. F F' are both the piston and valve rods, being rigidly secured to their respective valves at one end, and, passing loosely through the piston-heads *e e'*, terminate within their pistons with flatted heads *f f'*. Rubber washers G may be supplied upon the interior of the piston-heads, against which the rods F F' will strike at the end of each stroke. H H' are heads which separate the valve-chamber from the cylinders. I I' are heads closing the opposite ends of the cylinders.

The valves C and C' differ in their form, the one marked C' being a single valve with one central exhaust-cavity, the valve marked C being a double valve with two exhaust-cavities and a bridge in the middle. This is done

to avoid the necessity of crossing either of the two sets of passage-ways D, which would be necessary if two single valves were used.

When the single valve is moved to the right it supplies water to the right-hand end of its cylinder.

When the double valve moves to the right its supply is given to the left-hand end of the cylinder it controls, this being necessary to carry out the principle involved in the action of the meter.

To prevent the valves C C' from turning around upon their axis, one or both may have a pin, P, projecting from its edge, which can be allowed to play back and forth in a slot cut in the side of the valve-chamber, or the pin can project from the cylinder, and the slot be cut in the valve, as preferred.

K is a rod passing through a stuffing-box from the interior to the exterior of one of the cylinders. At the lower end of the rod inside the cylinder, an arm, L, will be secured; at the upper end a similar arm, L', which may have suitable connection with any ordinary registering device.

When the piston, at the termination of each double stroke, pushes back the arm L, the rod K is turned partly around, and may, by a connection to the ratchet-wheel of a registering-dial, record the action which may indicate the quantity of water passed through both cylinders, according to their capacity. A spring of any suitable form must be attached to the rod K to return it to its normal position.

I need not particularize the details of this registering device, for it does not form a novel portion of my invention.

The distance between the inside of the piston-heads, less the thickness of the rubber washers and the head of the piston-rod, should be equivalent to the entire stroke of the piston minus the travel of the valve to which it is attached. The travel of the valves should be double the width of the ports, and no lap should be given the valves.

M is the supply-opening. N' N'' are branches of the exhaust-passage N, each branch being controlled by its corresponding valve.

The action of the device is as follows: Assuming the position of the valves as in Fig. 1,

the piston E in cylinder A has just been forced by the entering water to the extreme outer end of its stroke, and has pulled the valve C with it, thus opening the exhaust for the inside end of the cylinder A', and the supply for the outside end. Now, the piston E' will move inward to the center until the head strikes against the valve-rod and throws the valve C', and thus, by opening the passage D to the exhaust and D' to the supply, the opposite piston E will be caused to make a similar half-stroke, each valve and piston alternating its action with the other as long as the supply continues. The piston E', striking the arm L, operates the registering device, as before described.

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

The hollow pistons E E', working in the cylinders A A', when, by means of the rods F F', they operate the valves C C' within the chamber B, for the purpose of controlling the supply to and escape of the water from the cylinders through the passages D D' D'' D''', substantially as and for the purposes set forth.

ALVAH C. AUSTIN.

Witnesses:

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