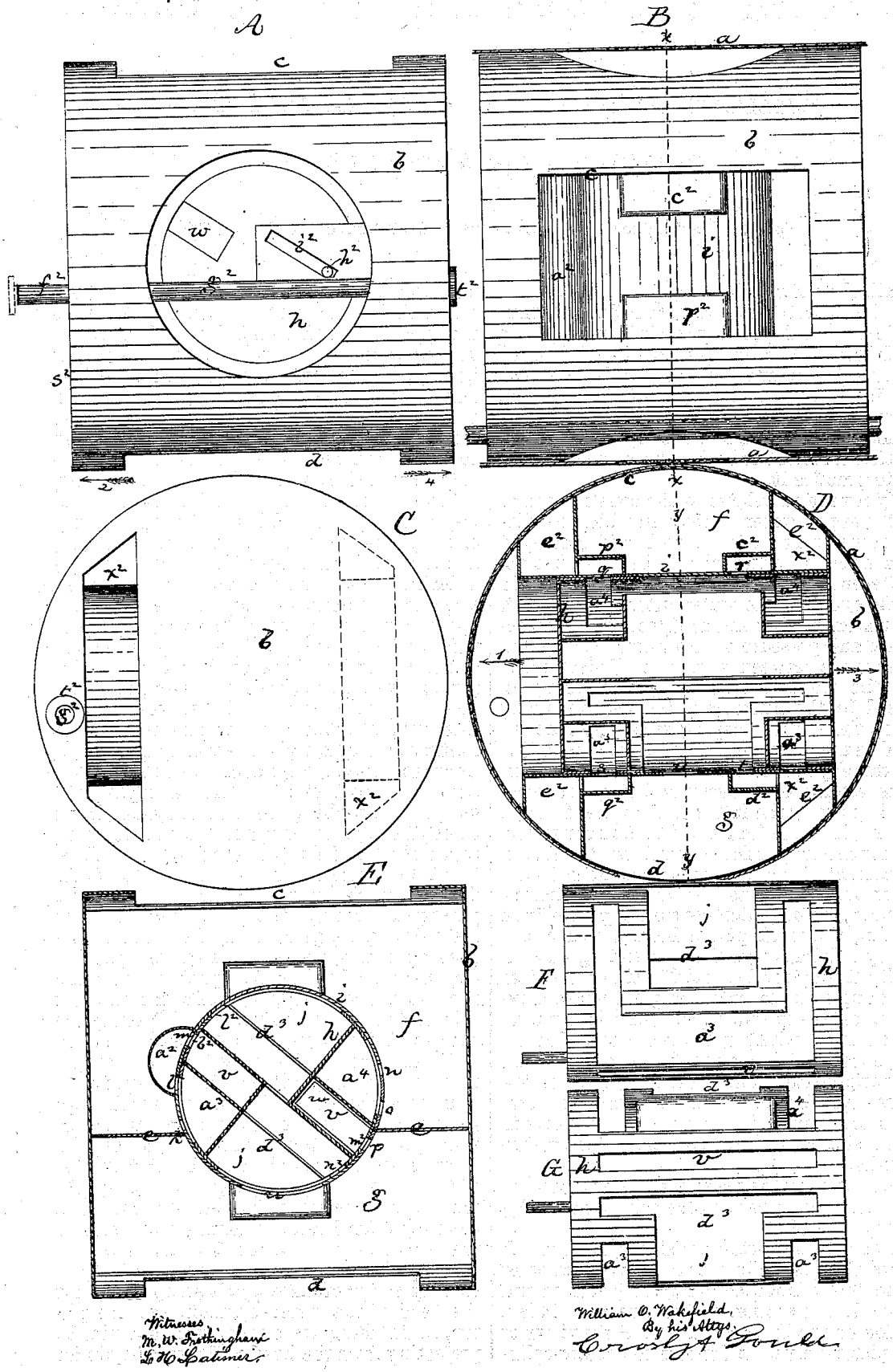
W. O. WAKEFIELD.

Water-Meter.

No. 127,126. Patented May 21, 1872.



Witnesses
M. W. Fitzhugh
L. W. Latimer

William O. Wakefield,
By his Attys.
Crosby & Gould

127,126

UNITED STATES PATENT OFFICE.

WILLIAM O. WAKEFIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 127,126, dated May 21, 1872.

To all whom it may concern:

Be it known that I, WILLIAM O. WAKEFIELD, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Water-Meter; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to the construction of that class of water-meters in which a cylindrical water or meter chamber is employed with a reciprocating piston, between the opposite ends of which and the adjacent heads of the cylinder the water alternately enters, the piston moving in one direction by the entrance and pressure of the water into the cylinder space between it and the adjacent head; and the movement of the piston being reversed by the flushing of the water-entering space, the water escaping from the space so filled as the opposite space fills, the piston being thereby moved in said reverse direction, these alternate movements being produced and kept up by the influx of the water into the meter-cylinder as long as said influx continues. My invention particularly relates to the arrangement of ports or water-passages in the piston and the ports of a valve or auxiliary cylinder, the invention consisting primarily in forming the meter-piston hollow, with a central cylindrical valve-chest extending diametrically through it from side to side thereof, at right angles to its axis, the piston-chest having a valve-cylinder (or cylindrical valve) placed in it, which valve reciprocates in the said chest, and has a rocking motion therein, the reciprocating and rocking motions of the valve-cylinder bringing various peripheral ports alternately into position with ports in the chest to fill the opposite ends of the meter-cylinder.

The drawing represents a meter-cylinder and piston and piston-valve cylinder embodying my invention.

A shows the piston in side elevation. B shows the piston in plan. C is a section of the meter-cylinder, showing the piston in end view. D is a section on the line *x x*. E is a section on the line *y y*. F and G are views of the piston-valve. *a* denotes the meter-cylinder, having a suitable central inlet at its top and a similar outlet at its bottom. *b* denotes the piston formed as a hollow cylinder, and having an inlet, *c*, at top and an outlet, *d*, at bottom, the hollow piston or piston-chamber being divided by partitions *e* into an inlet-space, *f*, and an outlet-chamber, *g*. In the center of this piston, but running transversely to the axis thereof, is the valve-cylinder *h*, located and sliding in a cylindrical shell-chest, *i*, in which it fits, the chest having series of opposite side ports, *k l m* and *n o p*, two top or inlet ports *q r*, two bottom or inlet ports *s t*, and a center exhaust-port, *u*. The valve-cylinder has on each of two opposite sides a water-space or chamber, a^3 or a^4, and beyond each space a^3 a^4, and separated therefrom by a partition, a chamber, *v*, each chamber *v* opening out of one end or head of the valve-cylinder through openings *w*, the two openings *w* being at the opposite ends of the valve-cylinder. The valve also has two water-spaces, d^3, connecting or extending diametrically through it. Suppose the valve-cylinder to be in the position shown at A and C. The water passes in at the inlet *c*, filling the chamber *f*, and flows through the ports *k o n*, and fills the inlet-passages a^3 a^4 of the valve-cylinder. (See Figs. 1 and 2.) From the inlet-passage a^3 the water flows through the port *l* into the port-cover passage a^2, through the ports *m* b^2, and into the valve-passage *v;* from there out at the opening *w* in the end of the valve-cylinder, (see view A,) flushing the space between the head of the valve-cylinder and the adjacent side of the meter-cylinder, and forcing the valve-cylinder through or across the piston in the direction of the arrow 1 at D. This position of the valve presents the inlet-passages a^3 a^4 to the ports *r t*. The water flows through the ports *r t* into the covered passages c^2 d^2, which have outlets into the large passage or chamber e^2, and from the chamber e^2 out at the end of the piston through an opening, x^2, filling the space between the piston-head and the meter-cylinder head and forcing the piston in the direction of the arrow 2 at A. Just before the piston has finished its stroke the protruding end f^2 of a slide, g^2, is stopped against the head of the meter-cylinder, and the piston, in finishing its stroke, carries a pin, h^2, projecting from the head of the valve-cylinder

to the top of an inclined slot, i^2, in a plate extending from the slide g^2, thus turning the valve-cylinder a sufficient distance to change the positions of the ports and passages, as follows: The valve-port b^2 is carried to the port l, the valve-port l^2 to the port m, the valve-port m^2 to the port o, and the valve-port n^2 to the port p. Water now flows in through the ports o and m^2, filling the passage v out through the opening in the end of the valve at w, flushing the space between the valve-head and the side of the meter-cylinder and forcing the valve back across the piston in the direction of the arrow 2. Meanwhile the water which before flowed out at w flows back through the same opening into the passage v out at the ports b^2 l into the port-cover passage a^2 through m l^2 into the passage j, which constitutes a part of the outlet-passage d^3 of the valve, which outlet-passage communicates constantly with the central exhaust or outlet-port u, which opens into the outlet-passage d of the piston. The valve-cylinder now at the end of its motion in the direction of the arrow 2, the inlet-passages a^3 a^4 are presented at the ports q s, and water flows through these ports into the covered passages p^2 q^2; from these into the large passage e^2 (which opens into the meter-cylinder at the end s^2 of the piston) out through said opening, flushing the space between the piston-head and the meter-cylinder head and forcing the piston in the direction of the arrow 4. Just before the piston finishes its stroke the rod is stopped by its protruding end t^2, striking the meter-cylinder head, and the pin is forced down the slot, turning the valve-cylinder back into its first position, as seen at A. Meanwhile the water contained between the opposite piston-head and the adjacent meter-cylinder head escapes by passing back through the passages at which it entered as far as the ports r t, through which ports it flows into the central outlet-passage d^3 of the valve, which, as has before been stated, communicates constantly with the exhaust or outlet-port u. All the ports having now assumed the first-described positions, the same movements and changes are repeated, the valve-cylinder again traveling across the piston, the piston moving along the meter-cylinder, and the water contained between the piston-head and the meter-cylinder head escaping by passing back through the ports at which it entered as far as ports j, through which ports it flows into the central outlet-passage of the valve and into the meter-cylinder, as has been described.

I claim—

The improved meter, having the hollow cylindrical piston (with its described water-ports, chambers, and passages,) and a central cylindrical valve-cylinder and cylinder-case or chest, (with their described water-ports, chambers, and passages,) relatively arranged, and combined and operating substantially as shown and described.

WILLIAM O. WAKEFIELD.

Witnesses:

FRANCIS GOULD,

M. W. FROTHINGHAM.