T. B. Fogarty,

Water Meter.

No. 111,624. Patented Feb. 7, 1871.

Fig. 1,

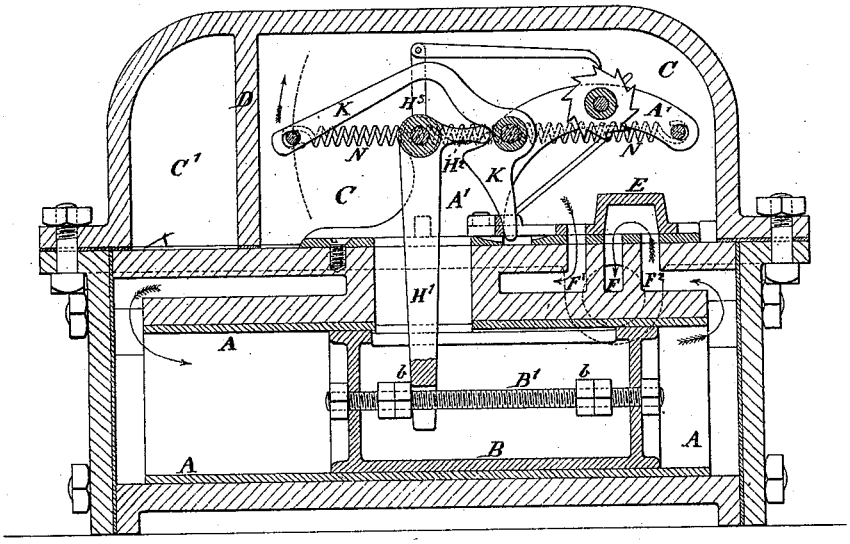
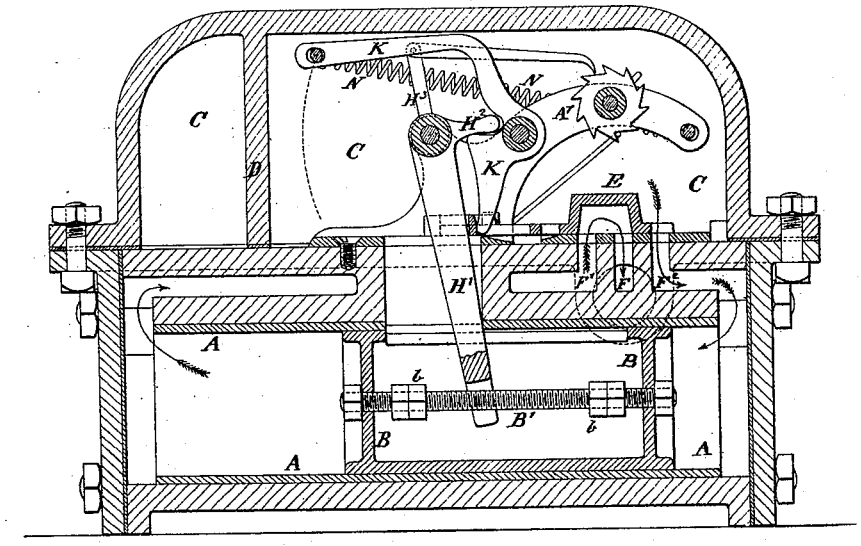


Fig. 2,



Witnesses,
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UNITED STATES PATENT OFFICE.

THOMAS B. FOGARTY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. **111,624**, dated February 7, 1871.

To all whom it may concern:

Be it known that I, THOMAS B. FOGARTY, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Meters; and I do hereby declare that the following is a description thereof, and of the manner in which I prefer to carry it out in practice, which is as full, clear, and exact as I am able to give, reference being had to the drawing hereto annexed, which forms a part of this specification.

My invention relates to that class of meters in which the amount of water or other liquid is estimated by actual displacement or measurement.

The water or other liquid to be measured is admitted alternately to the opposite ends of a piston working tightly within a cylinder or analogous inclosing-case, or to opposite sides of a flexible diaphragm, which may be made to perform in some degree the same functions.

In ordinary single-piston meters the flow of liquid is irregular and intermittent. My improvement remedies this defect, and is a cheap and desirable machine, delivering the water either rapidly or slowly, measured exactly, and without sensible intermission.

Both the figures represent central vertical sections. In Figure 1 the piston is just completing its movement to the right. In Fig. 2 it has completed its movement to the right and commenced to move to the left.

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

A is the cylinder, and B a long hollow piston, open on the upper side along the middle, and driven backward and forward within the cylinder by the action of the liquid. C C′ are two compartments formed on the top by the intervention of the partition D. E is the valve. F^1 F^2 are the ports, which are opened and closed alternately by the movements of the valve E, which are very rapid and certain. Through these ports the liquid enters and leaves alternately opposite ends of the cylinder, or, in other words, the chambers into which the cylinder is divided by the piston B.

I employ a peculiar mode of connecting the piston and the valve, and a mode of operating the latter so as to secure a steady and uniform flow of the liquid.

The cause of the intermittent delivery of the liquid from single-piston meters is, that when the ports are gradually opened and closed the size of the water or liquid passage is continually changing, and that for sensible times the ports are closed altogether. This defect I remedy by giving my valve a snap movement, and so constructing the valve and its connections that the ports will be fully open until the very instant of changing, when the valve crosses the ports with a rapid snap movement, so that it gives the flow of liquid no more obstruction than would be caused by drawing a knife-blade across the ports.

On reference to the drawing it will be seen that the long arm, H^1, of a bent lever extends down into the cylinder from the upper chamber, C, where it turns upon a center or shaft supported in the fixed framing or bracket A′ in such a manner that is short arm, H^2, engages in a notch in the lever K, which latter has a bearing in the same bracket. Now, the arm H^1 has its lower end forked, so as to straddle the screw B′ in or near the axial line from end to end of the piston; and as the piston moves backward and forward the nuts *b b* engage the ends of the arms H^1 near the end of each stroke, leaving it untouched during all of the early part of the stroke. When struck it turns the entire lever H^1 H^2, and by thus turning its short arm, H^1, is elevated or depressed so as to communicate a larger motion to the bent lever K. This lever K performs the important duty of moving the valve, and it effects this by a very rapid movement, however slowly the piston may be moving.

The long arm of this lever K is connected to the opposite end of the bracket A′ by the springs N, which exert a contractile force, and its short arm is inserted into a slot in an extended end of the valve E; but the slot is made so long that the ends of the lever can move backward and forward some distance therein before it strikes the end of the slot.

In Fig. 1 the spring is in a middle position, which it never occupies except for an extremely short period while snapping occurs, from one position to the other. In this position it exerts no influence either way; but as soon as the long end of the lever K is elevated or depressed, so as to carry the spring either above

or below the center upon which K works, the contractile force of the springs acts upon the lever, and causes its long arm to be thrown up or down with a rapid snap movement, so that its short arm will suddenly strike the valve at either end of the slot, and, with a quick tappet movement, throw it suddenly across the ports, so as not to interrupt the flow of liquid.

I connect the chamber C′ with the middle port, F, which serves as the outlet from the meter by a longitudinal passage, (not shown in the drawing,) so that this chamber will serve as an air-chamber, and, being in communication with the outlet of the meter, will compensate for any slight irregularity in the flow of the liquid at the moment of changing the valve.

H^3 is the arm which communicates motion to the registering mechanism, which latter may be of any ordinary or suitable character, and requires no description.

Instead of the springs N, one might apply a tilting weight or other analogous substitute; but this would so increase the size as to make it unwieldy and impracticable; and, instead of a piston with space within for play before striking H^1, I can use, with some success, a diaphragm with the lever H^1 fixed thereto and allowed to play in the junction of the arm H^2 with the lever K; but I much prefer the entire construction as shown.

I claim—

1. The hollow piston with open center and adjustable nuts B *b*, to act on the lever H^1, as and for the purposes described.

2. The snap-lever K, spring or springs N, and lever H^1 H^2, operated by the moving piece or piston B, which receives the pressure of (and by its motion measures) the water, substantially as herein set forth.

3. The cylinder A, hollow piston B, chambers C C′, valve E, and ports F F^1 F^2, in combination with each other and with the lever K, bracket A′, springs N, and lever H^1 H^2, and arranged to operate as and for the purposes described.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

THOS. B. FOGARTY.

Witnesses:
C. C. LIVINGS,
A. HOERMANN.