J. R. NORFOLK.

FLUID METER.

No. 184,979. Patented Dec. 5, 1876.

Fig. 1.

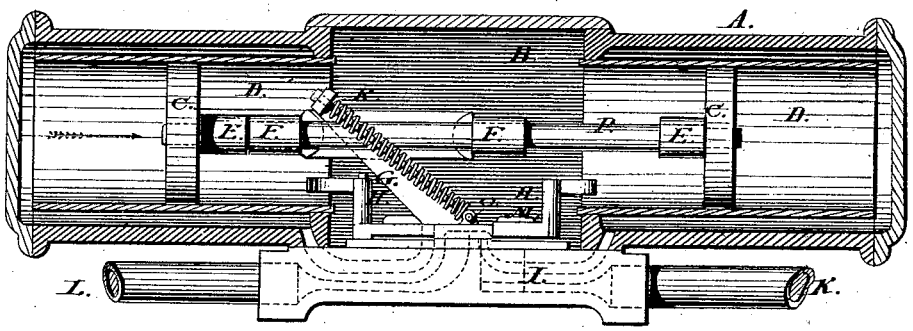


Fig. 2.

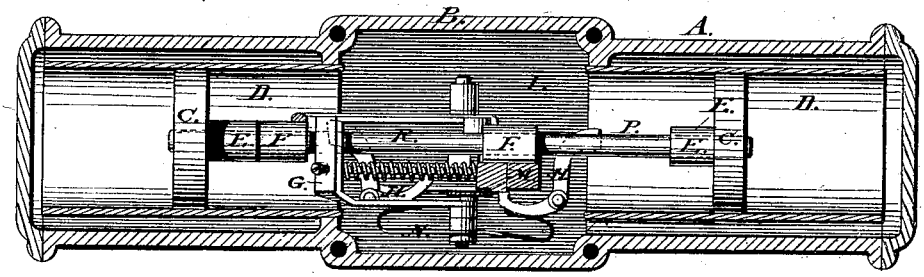
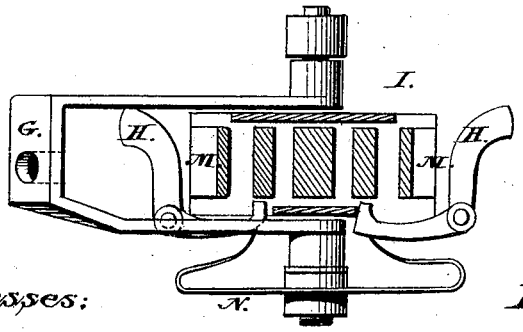


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN R. NORFOLK, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN FLUID-METERS.

Specification forming part of Letters Patent No. **184,979**, dated December 5, 1876; application filed September 20, 1876.

To all whom it may concern:

Be it known that I, JOHN R. NORFOLK, of Salem, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Fluid-Meters, of which the following is a specification:

My invention relates to the devices employed in effecting the instantaneous movement of the valve in fluid-meters, and in controlling the movement of the valve, as will be hereinafter set forth. In this meter the valve is moved by the recoil of a spring actuated directly by the piston, and is released or allowed to move at the proper time by latches, which are also operated by the piston, the object being to control the changes of the valve, so that the measurement is rendered absolutely correct. This mechanism may be applied to different forms of meters, having one or more measuring-cylinders or diaphragms. In this application I have shown it as combined with two cylinders, the movement being placed in a chamber between the cylinders.

The drawing represents, in Figure 1, a sectional elevation; in Fig. 2, a sectional plan; in Fig. 3, an enlarged plan of the valve-seat, latches, spring for latches, and stirrup.

A represents the casing, which incloses the measuring-cylinders D, and also forms the valve-chamber B. The casing is made of cast-iron or other suitable metal. The brass measuring-cylinders D are placed concentrically within the casing A. C C are the pistons secured to the piston-rod P. I represents the valve-plate and ports connecting with the cylinders, and showing the passage of the water between the valve-chamber B, cylinders D, and inlet K, and outlet-pipe L.

As shown in the drawing, the valve O is the ordinary form of the D-valve; but any other valve may be used. It is actuated by the recoil of the spring R, which is compressed through the movement of the pistons C. The spring R, with its stem, is retained in the stirrup G, which is hinged to the valve-plate I. The stirrup being moved by the dog F, which slides on the piston-rod, at each reciprocation of the piston the spring is placed in position to move the valve; but the valve is not moved until, by the continued movement of the piston, it is released by the latch H. The latch H retains the valve in place until the piston has reached the limit of the movement, which is determined by the length of the arm of the latch H. In this way the length of stroke of the piston is controlled, and the quantity of fluid delivered is constant at each reciprocation. The latches H are pivoted to the valve-plate I, and provided with a curved arm, so as to be moved by the piston at each reciprocation, and allowing the valve (which has been previously placed in position to be moved by the spring R) to be released, thus changing the direction of the current of fluid.

The use of the latch, in connection with the movement of the valve, is important when it is considered that the meter is to be operated under greatly-varying pressures; and the valve without the latch is liable to move quicker under a light pressure than when the pressure is heavier.

The latches H are kept in position to engage with the valve by the spring N.

I am aware that there are various forms of spring-valve movements used in fluid-meters in which the spring is compressed and moves the valve by the recoil. I do not claim any of these devices. In the arrangement herewith shown and set forth the valve is placed in position to be moved, and is moved by the recoil of the spring, acting directly through the movement of the piston, and in combination therewith the latches control the movement of the valve; and the latches being operated by the pistons, it follows that the length of stroke is constant under any variation of pressure or speed of movement, and the valve cannot be moved until the stroke is fully completed. The simplicity of this valve-movement renders it possible to build the meter at a lower cost than any other piston-meter. The movement is durable, and not likely to get out of order; and the certainty with which the valve moves, under any range of speed or pressure, makes it an accurate register of the qnantity of fluid passed through it.

I claim as my invention—

1. In a fluid-meter, the combination and arrangement of the spring R with the stirrup G and dog F, operated directly by the piston-rod, and used to move the valve O, substantially as set forth.

2. In a fluid-meter, the latches H H, operated by the pistons C C, for the purpose of controlling the movement of the valve O, substantially as set forth.

3. In a fluid-meter, the combination, with the mechanism for moving the valve by the direct action of the pistons through the spring R, of the latches H H, by which the movement of the valve is controlled.

JOHN R. NORFOLK.

Witnesses:
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