D. P. WEIR.

Fluid-Meter.

No. 164,116. Patented June 8, 1875.

Fig. 1

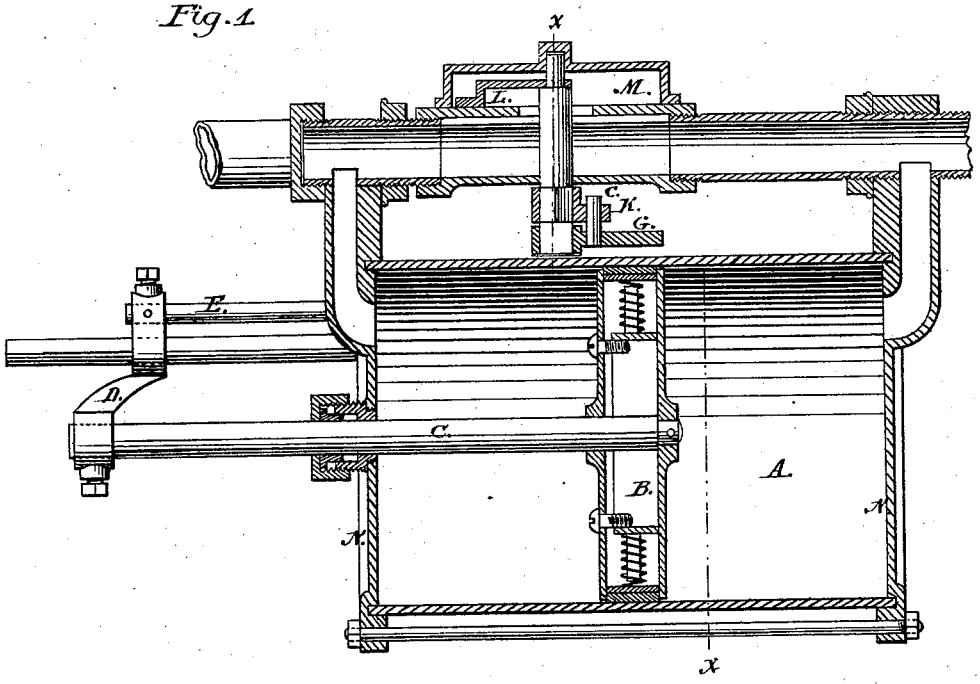


Fig. 2.

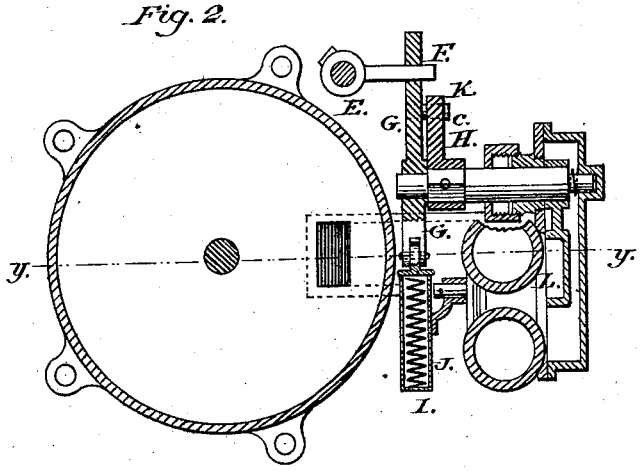
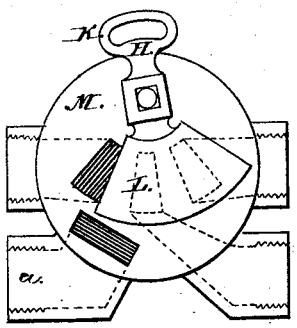


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

DANIEL P. WEIR, OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN FLUID-METERS.

Specification forming part of Letters Patent No. **164,116**, dated June 8, 1875; application filed January 8, 1875.

To all whom it may concern:

Be it known that I, DANIEL P. WEIR, of Salem, in the county of Essex and State of Massachusetts, have invented an Improvement in Fluid-Meters, of which the following is a specification:

My invention relates to an improvement in that class of fluid-measures in which a single cylinder and reciprocating piston is used, and in which the movement of the piston and connections produces the movement of the valve by which the admission of the fluid to alternate ends of the cylinder is secured; and it consists in the employment, in connection with the above-named elements, of a valve which is operated by means of a spring acting through a jointed lever, which is placed in position to allow the spring to move the valve by the alternate movement of the piston acting through suitable mechanism.

The drawing represents, in Fig. 1, a sectional view, taken on line *y y* of Fig. 2. Fig. 2 is a transverse section on line *x x* of Fig. 1. Fig. 3 is a plan of the valve and valve-seat.

A represents the cylinder, which I prefer to make of seamless brass tubing of proper size. B is the piston, and C the piston-rod. The piston-rod has an arm, D, on the end, projecting through the head of the cylinder, to which is attached a shaft, E, provided with dogs F F, by which the jointed lever G is tripped. The jointed lever has a bearing on the valve-stem H. The spring I is retained in the tube-bearing J, and is compressed by the jointed lever G until it passes the center, where it is released, and operates the valve through the slotted dog K, which is rigidly fastened to the valve-stem H. The valve L is loosely fitted to the stem H. It is a sliding D-valve, moving on the arc of a circle, and alternately covering and uncovering the ports in the valve-seat M. The cylinder-heads N N are cast with passages communicating with the inlet and outlet ports of the valve-seat; and in the construction here shown the inlet and outlet to the cylinder, and inlet and discharge pipes and valve-seat, are formed in one casting.

The operation of my meter is as follows: The piston being at one end of the cylinder, the water is admitted though the inlet-pipe *a* to the valve-chest *b*, and, passing through the port and passages to the cylinder, moves the piston B, and with it the piston-rod C, shaft E, and dogs F F. When the dog F comes in contact with the lever G, it is caused to move in the same direction as the piston is moving, and with the same speed, until it comes to the point of oscillation. During this movement a pin, *c*, in the lever *g* is being brought in contact with the end of the slot in the dog K, and the spring is being compressed. When the lever passes the center of its oscillation the spring is released, the movement of the lever is instantly accelerated by the expansion of the spring, and the valve is changed, reversing the current of fluid to the other side of the piston, and so on alternately.

The valve L is loosely fitted on the stem H, for the purpose of allowing it to fit on the valve-seat, without the necessity of fitting it exactly at right angles with the stem H.

If the stem H is imperfectly fitted, or changes by wear, the valve, being free, will move on its seat, so as to fit tightly.

The piston-rod is packed with a series of metal rings, one of which is made to fit the piston-rod and one the interior of the stuffing-box alternately, so that there is little friction. The joint is durable and always tight.

By the use of the devices herein shown and set forth, a meter is produced at reasonable cost, obviating the serious objection to the extended introduction of fluid-meters. The ram or shock caused by changing the direction of the currents of water is entirely avoided. The moving parts are simple, and not liable to be disarranged or get out of order. It is operated under a low pressure of fluid equally well as a high pressure. One of the valve-ports being always open, it has no dead-points, and can be adjusted to measure correctly.

I claim as my invention—

In combination with the inlet and outlet ports of a water-meter, the sliding valve L, loosely fitted to the stem H, slotted dog K, and jointed spring-lever G, all arranged to operate substantially as specified.

DANIEL P. WEIR.

Witnesses:

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