(No Model.) 2 Sheets—Sheet 1.

C. W. STICKNEY.

DIAPHRAGM WATER METER.

No. 285,175. Patented Sept. 18, 1883.

Fig. 1.

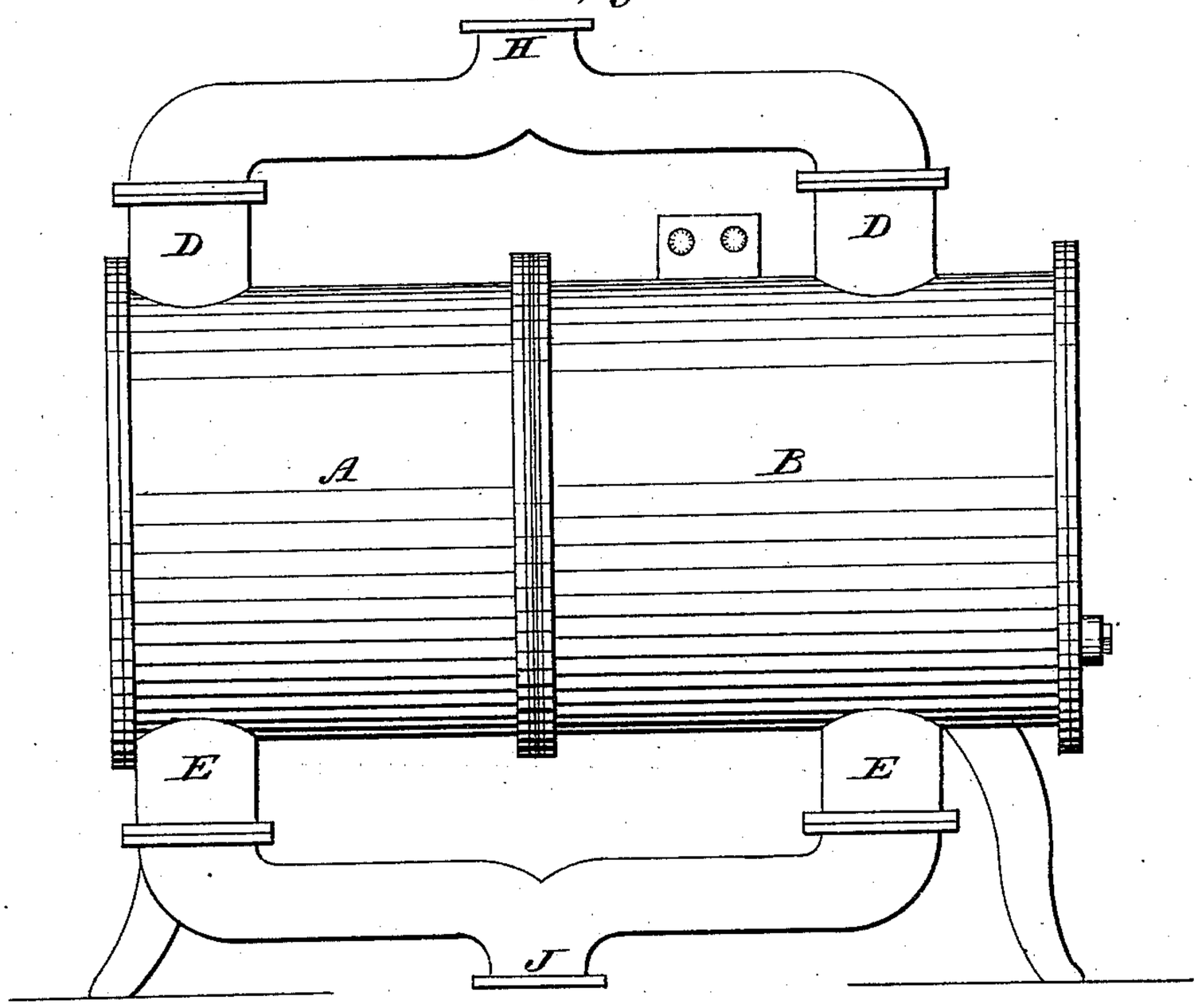
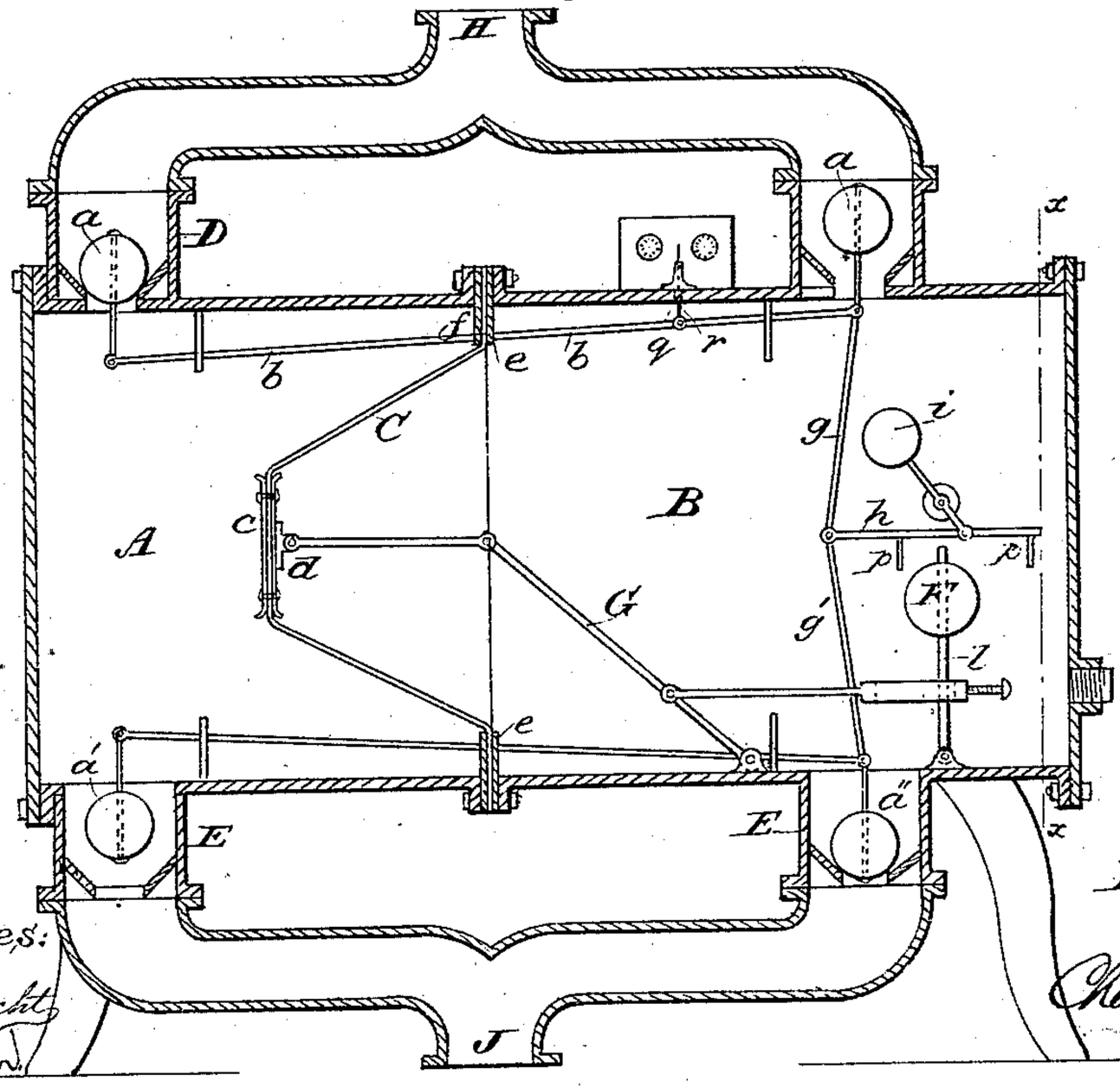


Fig. 2.



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So. F. Kelehen

Inventor:
Charles W. Stickney

(No Model.) 2 Sheets—Sheet 2.

C. W. STICKNEY.

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Fig. 3.

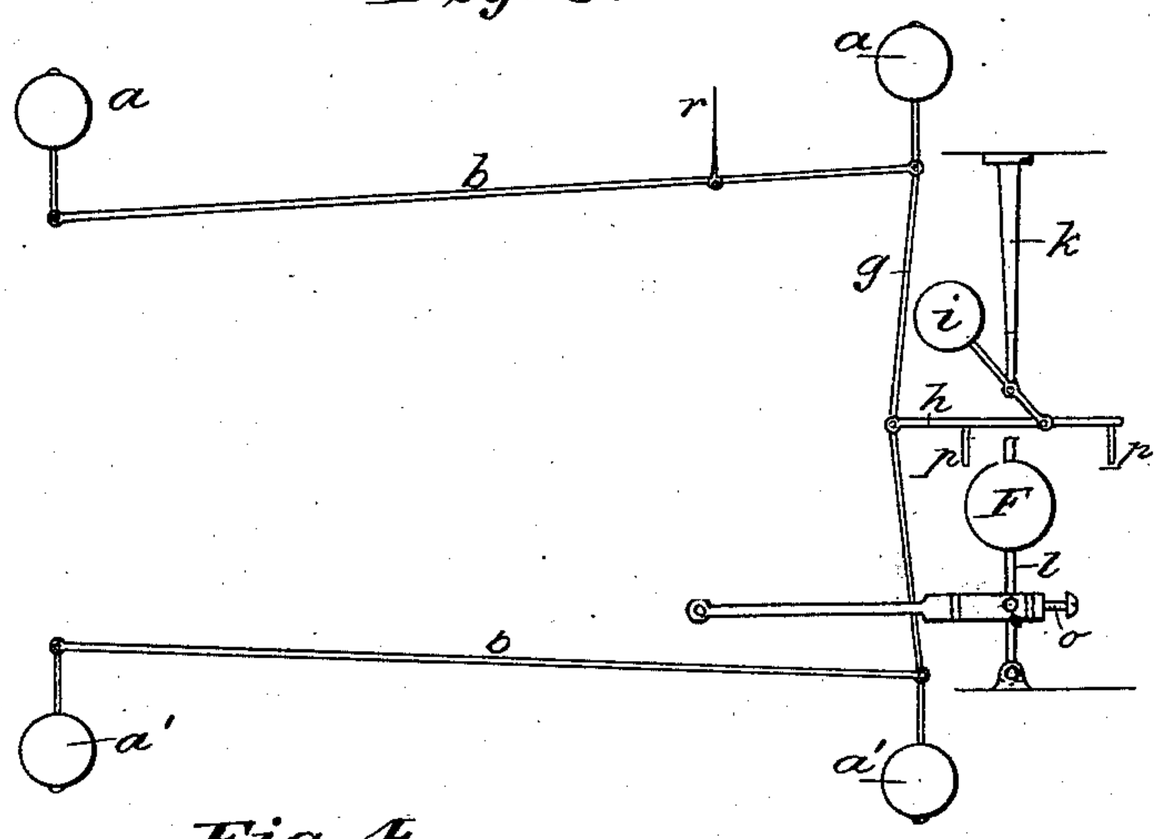


Fig. 4.

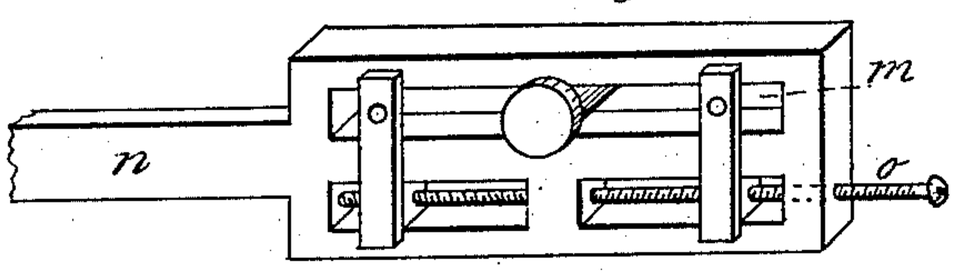


Fig. 5.

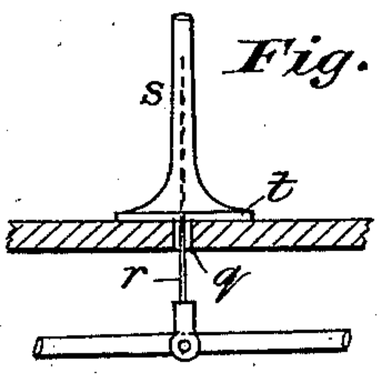
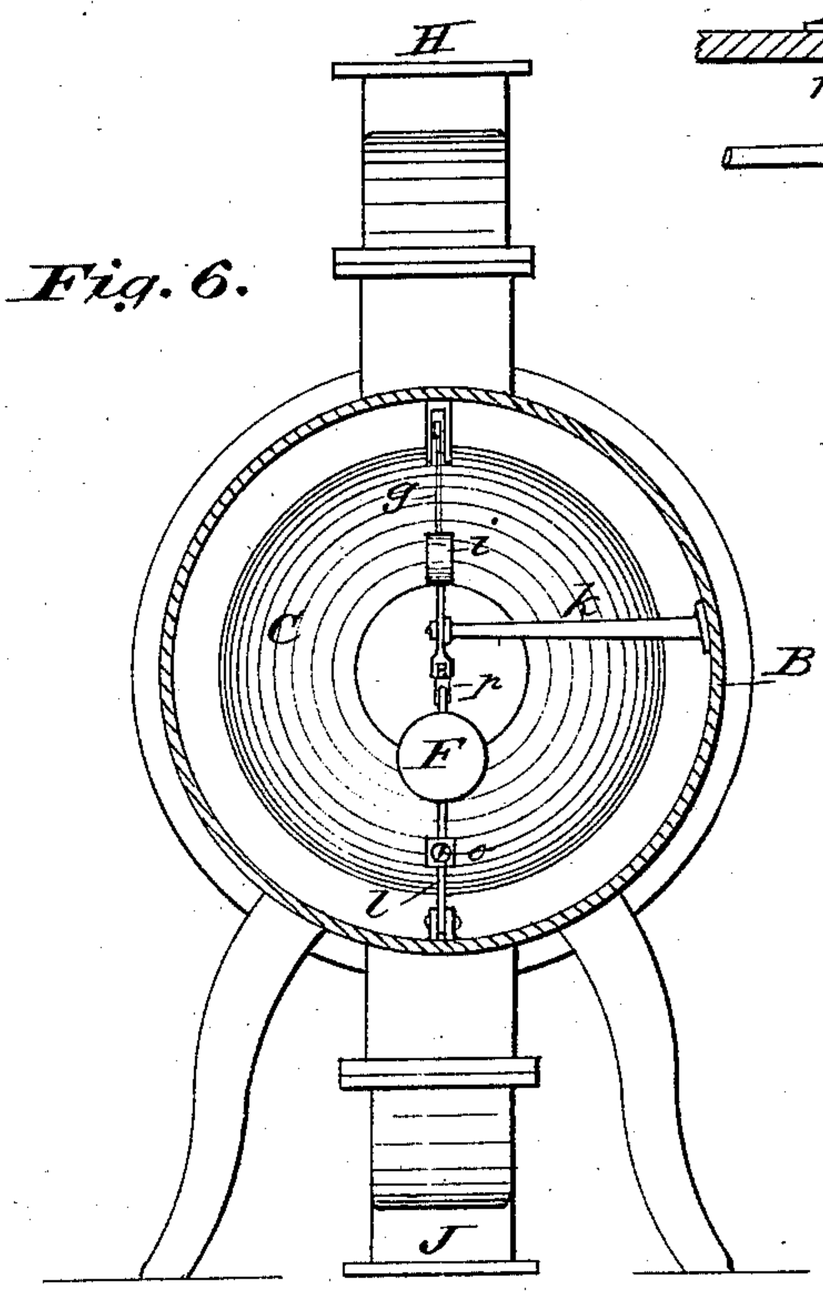


Fig. 6.



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Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES W. STICKNEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

DIAPHRAGM WATER-METER.

SPECIFICATION forming part of Letters Patent No. 285,175, dated September 18, 1883.

Application filed September 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. STICKNEY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention is a water-meter of the diaphragm variety. I use a cylinder flexible diaphragm, four ball-valves, levers and jointed elbow, connecting all four valves, a weight to operate the valves instantaneously, another smaller weight to lock the valves in position between each change, a screw on a slot to regulate the fall of the weight, and thereby the amount of water admitted between each change, and a water-proof casing on the needle, which connects the internal moving parts with the dials outside. The elements named are all old, except the auxiliary locking-weight, the peculiar arrangement of levers and jointed elbow, which connect the operating-weight to the valves, the screw on the slot, and the casing on the needle. These constitute my invention.

In the drawings, Figure 1 shows an exterior side view. Fig. 2 is an enlarged side sectional view, showing the operating-weight just about to fall and change the valves. Fig. 3 shows the auxiliary weight used for locking the valves, with its connections to the operating weight and valves. Fig. 4 shows the slot and screw. Fig. 5 shows the needle and casing. Fig. 6 shows the section on the line *x x*.

To construct, a common cylinder is made in two sections, A and B, between which is placed by ordinary methods a flexible diaphragm, C, with a rigid center piece, *c*, carrying an eye and bolt, *d*. Where the diaphragm joins the cylinder there is a ring, *e*, following the edge of the diaphragm, made of metal, and inclosed with the edge of diaphragm between the edges of the cylinder where the two parts thereof are joined. Call this the "diaphragm-ring." There may be two of these rings, flat and inclosing the edge of diaphragm between them. Their office is to be a fulcrum for the valve-levers.

At the ends of the cylinder are inserted two pipes, larger than the supply-pipes D on top of the cylinder, and just opposite on the bottom are two like outlet-pipes, E. These four pipes project transverse to the longitudinal axis of the cylinder, and are fitted with ball-valves, *a a′ a″*. These valves are connected by levers *b*, having fulcrum at *f*. The two upper are at the ends of one lever and the two lower at the ends of the other lever. One end of these two levers, respectively, is pivoted to the loose ends of an elbow-joint formed of two rods, *g* and *g′*. This elbow-joint projects inward toward the diaphragm, and its length is such that when almost straight two valves on different sides of the diaphragm are open and two are shut, and when bent inward the same thing occurs, with a change of each valve individually. This elbow *g g′* is connected by the auxiliary weight-lever *h* to the auxiliary weight *i*, which is pivoted to an arm, *k*, projecting from the side of the cylinder, in such a way that as the auxiliary weight swings back and forth as a pendulum turned upside down the elbow is alternately bent and straightened. The auxiliary weight-lever *h* carries two pins, *p*, projecting downward, which are of such distance apart that they just catch the operating-weight F as it swings from side to side. The operating-weight is placed on a rod, *l*, pivoted to the bottom side of cylinder like a pendulum turned upside down. It is engaged by a slot, *m*, on a rod, *n*, which rod *n* is pivoted to a rod, G, hinged to the bottom side of the cylinder. The latter rod, G, is attached by appropriate hinges and rods to the rigid center of the diaphragm C, so that the to-and-fro movement of the diaphragm causes it to sway. The slot referred to (*m*) is of such a length that the farthest movements to and fro of the diaphragm will just bring the center of gravity of the operating-weight F over its center of support. The slot *m* is furnished with a screw, *o*, in the end, which alters at will the length of the slot, may be a right-and-left screw.

The operation and purpose of the meter and its parts are as follows: Water enters the supply-pipe H and passes downward through whichever supply-valve is open—say the upper right-hand valve. The valves by construction are in these positions: right upper supply open; the left upper supply shut; lower right discharge is shut; left lower discharge

open. The diaphragm is pressed to the left and water forced out through the left discharge-valve, a'. The valves are kept locked by the auxiliary weight, which presses the balls down into their sockets in valves which are shut. As soon as the diaphragm brings the center of gravity of the operating-weight F over its center of support, the weight falls over to the left. Striking on the left pin of the auxiliary weight-lever h, it reverses the auxiliary weight i and with it the valves. The right discharge-valve, a'', is now open, through which the water rushes without changing its direction of flow. The diaphragm is now forced to the right by the pressure from the upper left supply. The upper supply-valves are connected to one supply-pipe, H, and the lower discharge are connected to one discharge-pipe, J. The dials for recording the operation are placed on top, and thus connected. A hole, q, is pierced in the cylinder large enough to admit a needle, r, whose lower end is pivoted to the upper valve-lever, or screws into a piece so pivoted. The upper or exterior projection of the needle is incased in a rubber pencil, s, whose lower end flares out into a rubber flat ring, t, resembling a trumpet's mouth, which ring is held firmly and water-tight against the cylinder by a washer screwed down upon it. The upper end of the rubber pencil s, inclosing the needle, is connected to the dials by a spring-pawl or any other convenient device.

I am aware that weights have been used in water-meters to move the valves, and that a main oscillating weight is shown in the patent of Hartin, No. 9,746; also, that Melling's Patent No. 204,357 shows a second weight for the purpose of counterbalancing the weight of the valve-piston, and that Hartin's patent, referred to above, also shows a screw for regulating the movement of the valves; but I claim none of these devices.

I claim as my invention—

1. In a water-meter, an oscillating weight, independent of the main weight which moves the valves, said oscillating weight operating to lock the valves in one rigid position until the next change is produced.

2. A right-and-left-hand screw on the slot, which contracts the length of the slot on both sides, and thus controls the movement of the valves, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES W. STICKNEY.

Witnesses:

T. C. BRECHT,

LLOYD F. KELEHER.