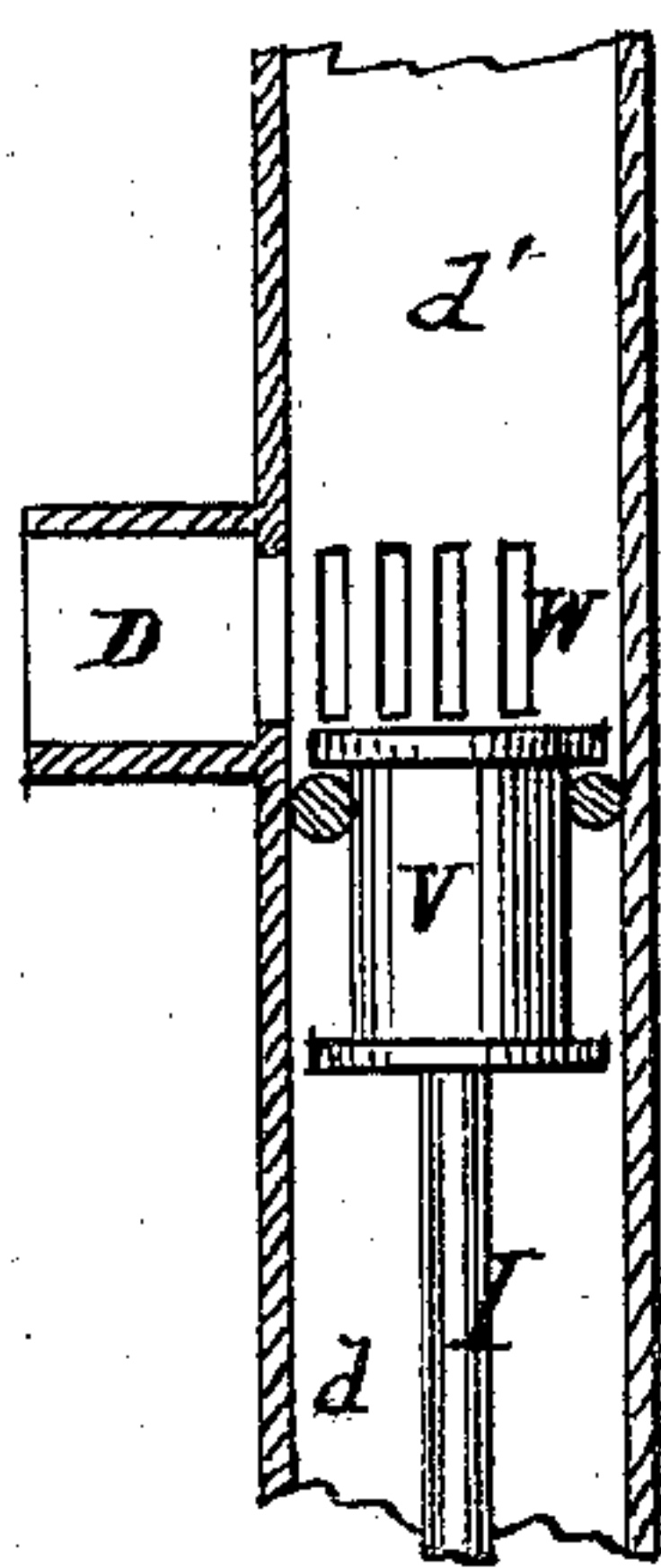
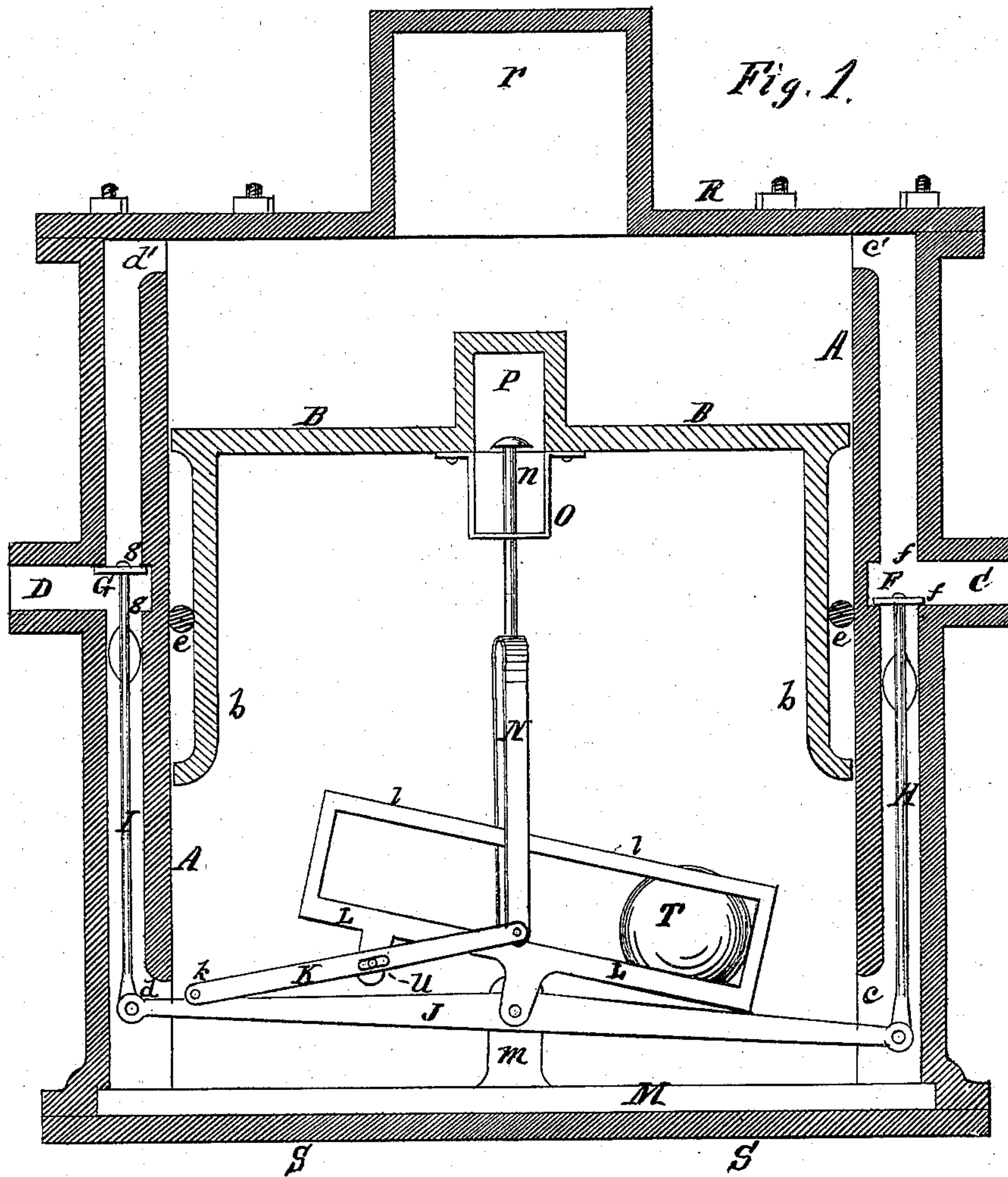


F. A. MORLEY.
Liquid Meters.

No. 137,559.

Patented April 8, 1873.



Witnesses:

Levi M. Prentice
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Inventor:

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UNITED STATES PATENT OFFICE.

FRANKLIN A. MORLEY, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN LIQUID-METERS.

Specification forming part of Letters Patent No. **137,559**, dated April 8, 1873; application filed November 4, 1872.

To all whom it may concern:

Be it known that I, FRANKLIN A. MORLEY, of Syracuse, in the county of Onondaga and State of New York, have invented certain Improvements in Liquid-Meters, of which the following is a specification:

This invention relates, first, to an improved arrangement of the valves and valve-seats with relation to the cylinder and valve-operating devices; and second, to an improved movement or combination of devices for operating the valves; and, third, to a supporting-bar on which the valve-working devices are placed independent from the head or bottom of the cylinder, so that the working parts of the meter can be all set up in complete working order within the meter before the head and bottom of the cylinder are put on, thus facilitating the placing of the working parts correctly in the cylinder, as hereinafter more fully described.

Figure 1 is a vertical central section of the meter, and Fig. 2 shows a modified construction of the valves.

A A is the cylinder, which is made with an induction-pipe, C, and discharge-pipe D, with double ports *c' c d' d* branching off to the opposite ends of the cylinder, and making connection with the main chamber of the meter above and below the piston B, as shown. The piston B is made with a hanging rim or flange, *b*, on which a rubber packing-ring, *e*, rolls, to make a frictionless packing between the piston and the walls of the meter. The two valves are shown by G F. The valve F works between the valve-seats *ff* and the valve G between the seats *g g*, each valve having a double valve-seat. These valves connect with a vibrating lever, J, by means of the rods H and I. This lever J is pivoted at its center to a standard, *m*, and is operated by a rolling weight or ball, T, that rolls from one arm of the lever to the other, as the movement of the piston tilts or changes the inclination of the rolling bed or table L, which is done as follows: The rocking table L is placed above the lever J and pivoted to the standard *m*. A rolling weight or ball, T, is placed on this table and inclosed by the rods *l l* to form a cage for retaining the ball on the table. The table is tilted by a lever, K, that is pivoted to the lever J at *k*, and also makes connection with the table by a pin and

slot, *u*, and a yoke, N *n*, connects the said lever K with the piston. The rod *n* of the yoke passes loosely through a flat U-shaped piece of metal, *o*, that is attached to the piston and terminates in a button or head, as shown. The position of the valves shows the piston to be on its descending stroke, the water entering the pipe F to the upper side of the piston and escaping from the lower side of the piston through the pipe D. There is considerable lost motion between the piston and the rod *n*, as the rod slides loosely in the piece *o*; but when the piston has descended so that *o* comes in contact with N the movement of the piston reverses the inclination of the table, and, the ball rolling to the opposite end of the table, the valves are reversed by the weight of the ball. When the piston rises so that the head of the rod *n* comes in contact with *o* the table L is again reversed and the rolling weight reverses the valves. The track on which the ball rolls is slightly depressed at each end, so that the ball will not start until the bed or track is sufficiently inclined to carry the ball entirely across to the opposite end, thereby preventing the valve-operating devices from stopping on a center. It will be seen that, the fulcrum of the lever K being on the valve-lever J, a pressure is kept on the valves to hold them to their seats until the ball crosses to the opposite side and reverses them. The valve-rods H I are steadied in the ports by short projections or ribs running longitudinally with the rods, the said ribs fitting loosely against the walls of the ports. The valve-seats are dressed up and faced by introducing a rose-head cutter through the main pipes C and D and running the stem of the cutter in at the end of the ports, the tool being made in two parts. The valves can be made flat, as shown, or they can be of a spherical form, of rubber or other material; or piston-valves may be used, as shown in Fig. 2, the pistons V having each a rolling packing-ring of rubber, and the openings that connect the service-pipe D C with the ports being a series of slots, W, so that the ring-packing can cross said openings to the opposite side. The registering devices are placed in the chamber *r* in the cover of the meter and actuated by contact with the piston at each stroke.

The pin-connection at *u* can be dispensed

with by casting the table L with two projections between which the lever K can work.

Instead of setting up the valve-throwing devices on the bottom plate or head S S of the cylinder, the cylinder is cast with recesses to receive the ends of a narrow bar, M, and on this bar is the fulcrum *m* or standard. The works are set up on this bar and placed in the meter, and the working parts all secured in place and made complete before either end of the cylinder is closed up, thereby facilitating the work of putting the meter together and insuring a tight fit of the valves on their seats, as the bar M always comes to the same position, while the heads of the cylinder change their position with a greater or less compression of the packing between the said heads and the cylinder ends.

A flexible diaphragm can be used in place of the piston or any of the known modifications of the piston.

I claim—

1. The combination and arrangement of valves F G, rods H I, the lever J, and a piston, B, with the cylinder A having ports C c c' D d d' and double valve-seats *f f' g g'*, all operating substantially as herein described.

2. In combination with the lever J, valves, and piston, the tilting frame L T and connections K N n O, all arranged and operating substantially as herein described.

3. In combination with a casing, A, having removable heads and containing operating mechanism, substantially as herein described, the bar M, employed in the manner and for the purpose set forth.

The above specification of my invention signed by me this 3d day of October, 1872.

F. A. MORLEY.

Witnesses:

L. W. PRENTICE,
S. W. PRENTICE.