(No Model.)

R. T. VAN NORDEN.

WATER METER.

No. 264,975. Patented Sept. 26, 1882.

FIG. 1.

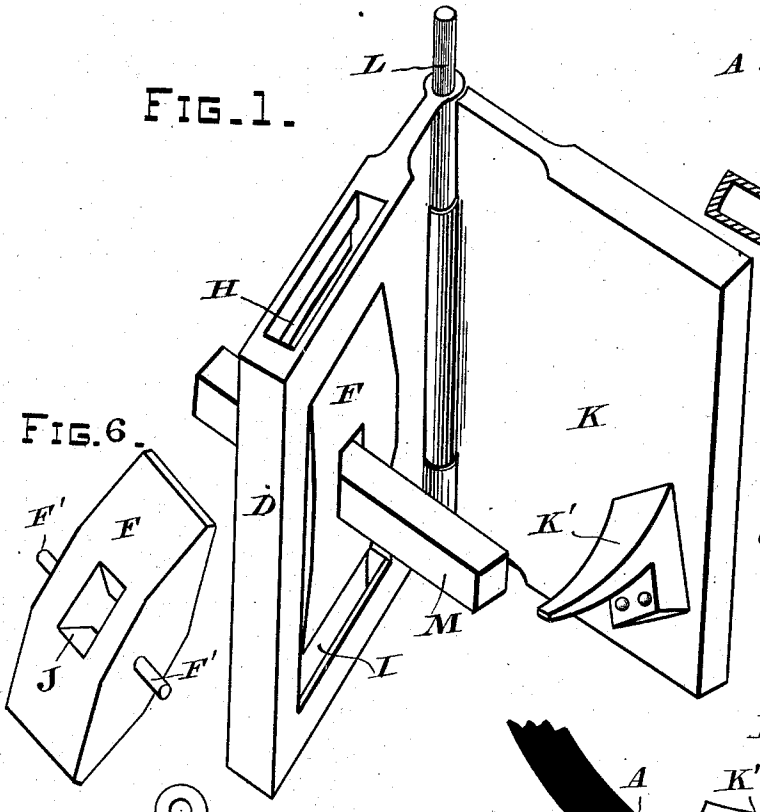


FIG. 6.

FIG. 4.

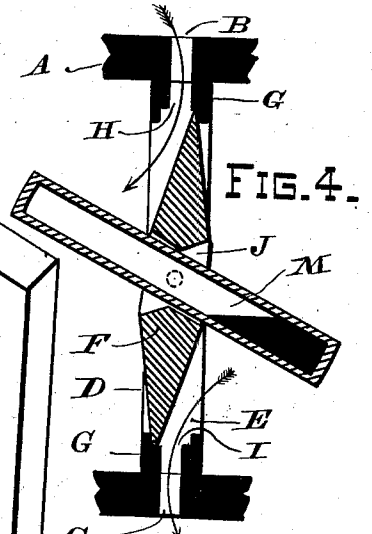


FIG. 2.

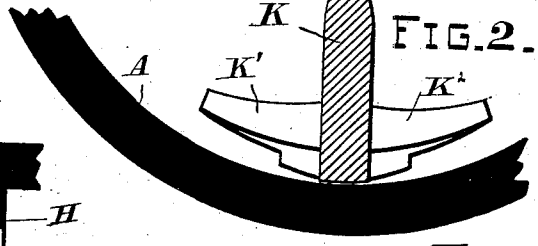
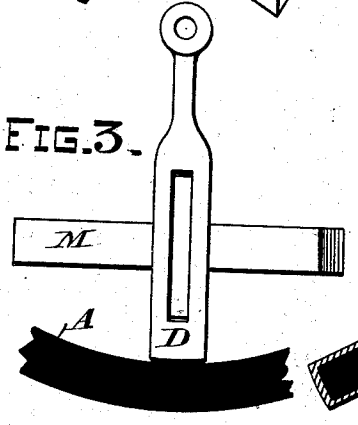


FIG. 3.



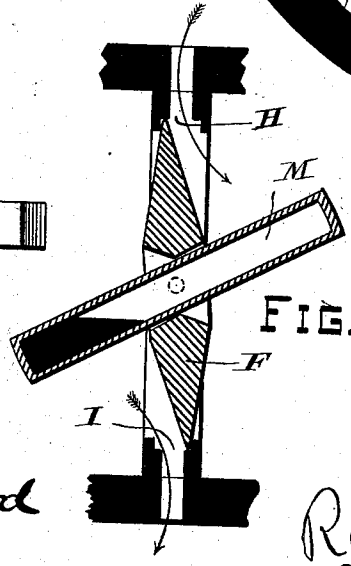
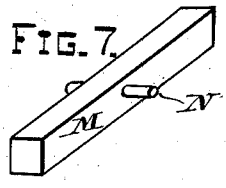


FIG. 5.

FIG. 7.



WITNESSES.

Wilmer Bradford

George Derby

INVENTOR.

Robert T. Van Norden

By E. W. M. Smith,

Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ROBERT T. VAN NORDEN, OF SAN FRANCISCO, CALIFORNIA.

WATER-METER.

SPECIFICATION forming part of Letters Patent No. 264,975, dated September 26, 1882.

Application filed May 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, ROBERT T. VAN NORDEN, a citizen of the United States, and residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Water-Meters, of which the following is a specification.

My invention relates to improvements in water-meters which are operated by the pressure of the incoming water within an inclosing cylinder, jacket, or drum of a known capacity; and the objects of my improvements are, first, to provide a water-meter with a wing or fan piston carrying upon either side inclined or beveled lugs which operate upon the valve controlling the inlet and outlet passages of the meter; second, to provide a water-meter with a diaphragm having within itself induction and eduction ports and a vibrating valve, the oscillation of which opens and closes the supply and outflow of fluids from either side of such diaphragm. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the operating parts of my machine, the inclosing case or drum being omitted. Fig. 2 is a sectional plan view of the wing-piston, inclined lugs, and a portion of the inclosing case or drum. Fig. 3 is a top view of the diaphragm and balance-beam. Figs. 4 and 5 are central vertical sections through the diaphragm, showing the vibrating valve and balance-beam in reversed positions. Fig. 6 is a perspective view of the vibrating valve. Fig. 7 is a perspective view of the balance-beam.

Similar letters of reference are used to indicate like parts throughout the several views.

The casing A is made cylindrical, and has flat heads at either end, through which a water-passage is made, that in the upper head being denominated the "inlet-passage," B, and that in the lower head the "outlet-passage," C. The passages should be connected with suitable supply and delivery pipes in the ordinary manner. The radial diaphragm D is placed vertically within the cylinder, and forms a close connection with the upper and lower heads thereof, and has formed within it a seat or opening, E, for the pivoted vibrating valve F, which is pivoted therein by the trunnions F'. (Shown in Fig. 6.) The opening E does not extend the whole depth of the diaphragm, but is closed at the top and bottom by the horizontal bars G G, having upon their inner faces an offset, as shown in section in Figs. 4 and 5, which limits the throw of the valve, the space left between the bars forming the induction and eduction ports H I, which are simultaneously opened and closed by the vibrating valve F, so as to admit and discharge the fluid upon opposite sides of the diaphragm. The valve F, is pierced at its center by a transverse slot or aperture, J, the upper and lower sides of which are beveled, as shown, the degree of such beveling regulating the oscillation of the balance-beam M, which is pivoted therein, by means of the trunnions N. (Shown in Fig. 7.) The balance-beam is made hollow, and is partially filled with quicksilver, as seen in Figs. 4 and 5, by means of which its weight is shifted when operated for the purpose hereinafter explained. The wing-piston K has projecting from each side an inclined lug, K' K^2, and is keyed upon the axial shaft L, which turns freely in a step formed in the lower head, and in a water-tight bearing formed in the upper cylinder-head, through which it projects, and is connected with any appropriate recording or registering mechanism.

The operation of my improved water-meter will be as follows, to wit: The meter having been placed in position and suitable connection made with the supply and delivery pipe, the flowing water will enter through the induction-port H in the diaphragm D and fill the space to the left of said diaphragm, and at the same time gradually force the wing-piston around until the curved lug K' engages with one end of the balance-beam M, and by raising or elevating that end permits the quicksilver to fall to the opposite end, and thereby quickly tilt the valve into the position shown in Fig. 5, and hold it in that position until the balance-beam is again operated upon. The valve being in the position last described, the constantly-flowing water will be diverted to the right-hand side of the diaphragm and will press back the wing-piston, which as it is advanced by the pressure of water behind it forces the water which entered upon the left out through the eduction-passage I, and con-

tinues so to do until the lug K^2 engages with the balance-beam and again trips it and throws the valve into its original position, as shown in Fig. 4. Thus it will be seen that the water which is received upon one side is discharged upon the same side, and that when the meter is receiving upon one side of the diaphragm it is discharging upon the other.

By this construction I am enabled to produce a water-meter at a low cost of manufacture, extremely simple in construction, and impossible to get out of order, easy of operation, and one that will accurately register the quantity of fluid flowing through it.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A water-meter having a fixed radial diaphragm in which are formed induction and eduction passages controlled by a vibrating valve in which is pivoted an oscillating or balance beam having a shifting weight and operated by inclined lugs or projections upon a wing-piston operating within the meter case or drum, substantially in the manner and for the purpose set forth and described.

2. In a water-meter having suitable fluid-passages, the combination of the fixed radial diaphragm D, having induction and eduction ports or passages at either end controlled by a vibrating valve, F, operated by a balance-beam, M, having a shifting weight, substantially in the manner and for the purpose herein set forth and specified.

3. In a water-meter provided with a diaphragm and having suitable water-passages, the combination of the vibrating valve F, vibrating wing-piston K, and inclined lugs K' K^2, constructed, arranged, and operating substantially in the manner and for the purpose set forth and specified.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 24th day of April, 1882.

ROBERT T. VAN NORDEN. [L. S.]

Witnesses:

C. W. M. SMITH,

CHAS. E. KELLY.