(No Model.) 2 Sheets—Sheet 1.

F. T. GILBERT.

ROTARY WATER METER.

No. 348,277. Patented Aug. 31, 1886.

Fig. 1.

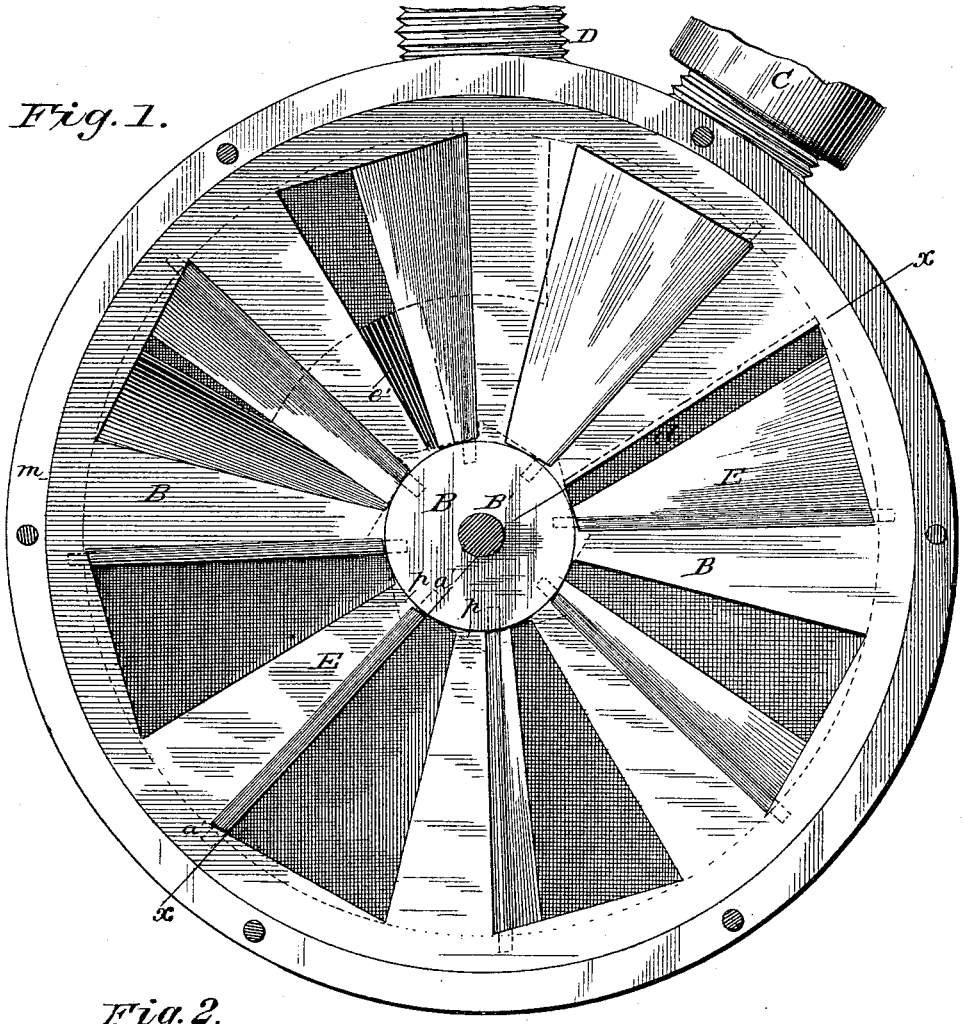
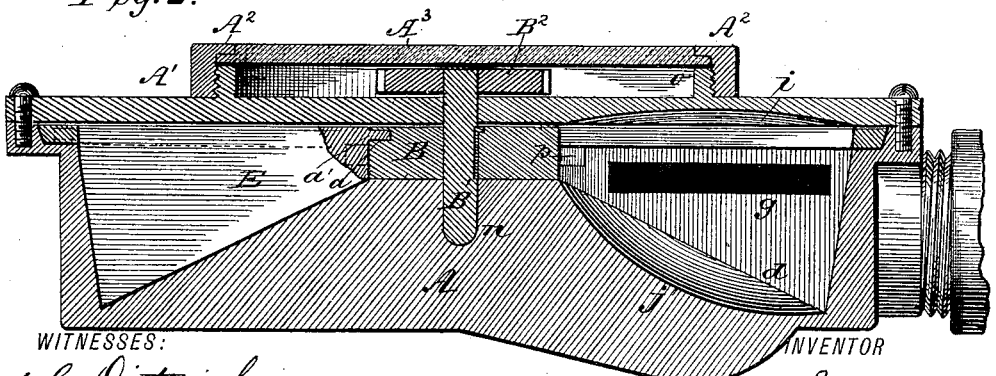


Fig. 2.



WITNESSES:

Fred. J. Dieterich

Edw. L. Byrn.

INVENTOR

F. T. Gilbert

BY Munn & Co

ATTORNEYS

(No Model.) 2 Sheets—Sheet 2.

F. T. GILBERT.

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Fig. 3.

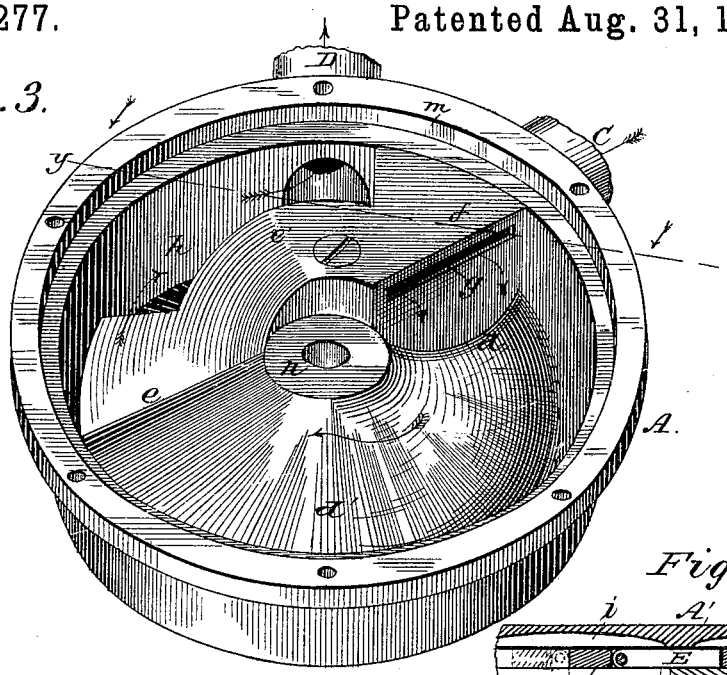


Fig. 6.

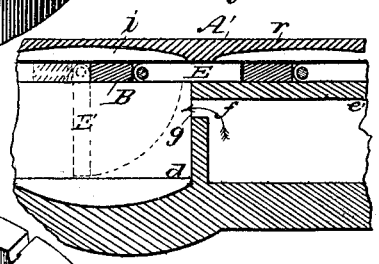


Fig. 4

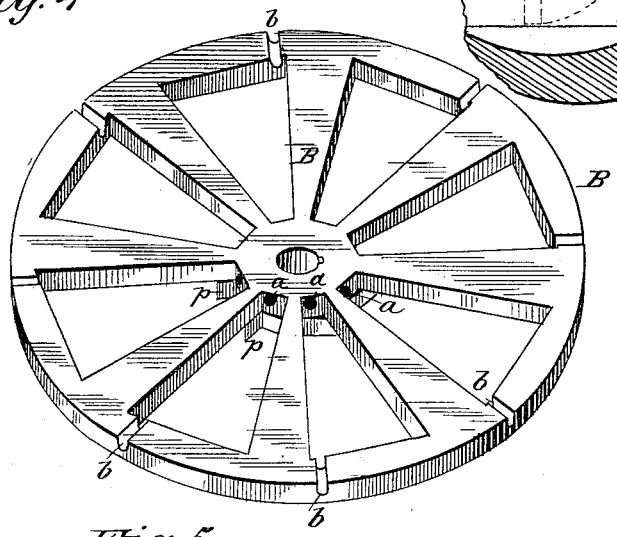
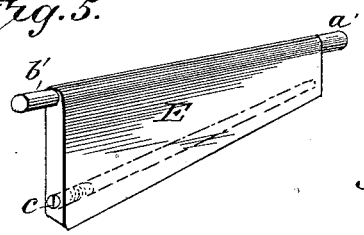


Fig. 5.



WITNESSES:

Fred. G. Dieterich

Edw. W. Byrn

INVENTOR

F. T. Gilbert

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANKLIN T. GILBERT, OF WALLA WALLA, WASHINGTON TERRITORY.

ROTARY WATER-METER.

SPECIFICATION forming part of Letters Patent No. 348,277, dated August 31, 1886.

Application filed November 14, 1885. Serial No. 182,826. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN T. GILBERT, of Walla Walla, in the county of Walla Walla, Washington Territory, have invented a new and useful Improvement in Water-Meters, of which the following is a description.

My invention relates to water-meters of that class in which a rotating wheel is arranged within a case, and is provided with wings mounted upon radial axes in the wheel, and which wings are adapted to act like pistons to take the pressure of water coming in through an inlet-pipe to turn the wheel, and which wings gradually turn upon their axes into a horizontal plane in their passage over an incline bed as they move toward the outlet-pipe.

My invention consists in certain features of improvement upon this form of meter, whereby the parts are made to act more certainly, positively, and efficiently, as hereinafter fully described.

Figure 1 is a plan view of the meter with the cover removed, and showing the wheel within. Fig. 2 is a vertical central section through the line *x x* of Fig. 1, showing the cover applied to the top of the meter. Fig. 3 is a perspective view of the meter-case. Fig. 4 is a perspective view of the rotating wheel. Fig. 5 is a perspective view of one of the wings of the revolving wheel, and Fig. 6 is a section through *y y* of Fig. 3.

In the drawings, A represents the case of the meter, which is provided (see Fig. 3) with an inner peripheral recess, *m*, and a central step-bearing, *n*. In this peripheral recess fits the outer edge of the wheel-frame B, Fig. 4, while to the center of this wheel-frame is keyed (see Fig. 2) the spindle B′, which rests in the step-bearing *n* and supports the wheel, and permits it to turn with the least amount of friction. The case A is formed with an inlet, C, and an outlet, D, at which points in the case the chamber formed therein is of the greatest depth. At the point where the water enters there is a vertical wall, *f d*, through the top of which a slot, *g*, is formed, which gives passage to the water from the inlet C to the interior of the case. The bottom of the case from this point to *d′* is a bellied incline. From *d′* to *e* it is a conical plane with straight radial lines. From *e* to *e′* it is again inclined as a helical plane with straight radial lines, and from *e′* to *f* it is horizontal and flush against the bottom side of the wheel. This bottom of the case may be cast in one piece with the case; or a part of it, as from *e* to *e′* to *f*, may be made in a separate plate and fastened down by a screw, as shown in Fig. 3. The bottom of the case from *d* to *d′* is not a straight incline or true plane; but it is curved, bellied, or hollowed out to a larger capacity than that which would be filled by the wings or pistons for a special purpose, hereinafter described. From *d′* to *e*, however, the bottom is straight in radial direction, as is also from *e* to *e′* and from *e′* to *f*. A part of the incline from *e* to *e′* is, however, cut away, as at *h*, in order to give greater clearance to the water in escaping to the outlet D, and said incline *e* to *e′* may (instead of being a solid plane) be formed as circular inclined ribs, which, while they serve to raise the wings of the wheel, as hereinafter described, secure the additional advantage of a greater clearance for the water in escaping to the outlet D. The wheel B is formed with radial spoke-sections and alternating triangular spaces, in which fit the correspondingly-shaped wings E, which, when shut up into the same plane with the wheel-frame, form a solid disk. The wings E have journals *a′ b′*, which fit, respectively, into the bearings *a b* in the wheel, and are thereby sustained therein upon axes radial to the wheel. One of these sets of bearings (the outer set, *b*, preferably) is made open at the top, so that the wing-journals may be readily fitted into or lifted out of the wheel. The hub of the wheel has also stop-lugs *p*, against which the wings bear when in a vertical position, and by which pressure is transmitted from the wings to the wheel. Now, it will be seen that as the water enters at C and passes into the case through the opening *g* at top of wall *f d* it strikes (see Fig. 6) against the wings of the wheel, which wings are thus quickly thrown into a vertically-pendent position, and the pressure of the water then forces the wheel around, the inclined surface of the bottom serving to gradually fold the wings into a horizontal position as they pass around to the higher level, *e′ f*, and as the wheel turns its spindle B′ is made to turn a gear-wheel, B^2, Fig. 2, which is connected with any suitable train of registering-gears, which are made to

register the revolutions of the wheel; and, the discharge of the meter for each revolution being known in quarts, gallons, or other definite measures, it is obvious that the meter is thus made to measure the amount of water passed in any given number of revolutions. Just above the registering mechanism there is secured a glass plate, A^3, whose edge is clamped down a threaded flange, *o*, by a screw-threaded ring, A^2, which closes on the registering mechanism with a water-tight joint, suitable packing or gaskets being used at the joint for this purpose.

I will now describe the purpose of the curved or hollowed bottom *d d'* of the case. If the bottom of this part of the chamber should fit tightly against the lower edge of the wings, the latter would not promptly drop to their proper position when they pass off of their high level *e' f*, for the reason that there is already a pressure of water beneath them sufficient to hold them up. By hollowing out the bottom surface a greater capacity is given this part of the chamber than the vertical depth of the wings, and the water has a chance to pass around the lower edge of the wings as they successively drop to a vertical position, and they are thus enabled to secure a prompt, positive, and effective action, which is so necessary to accurate measurement. For the same purpose I also hollow out the lower side of the cover A', as shown at *i*, Figs. 2 and 6, which also prevents the wings from sticking by suction to the top plate when they are required to drop from their parallel contact therewith. To let the water escape from between the wing and the top plate as the wing passes up incline *e e'* to the higher level, *e' f*, the top plate is also hollowed out at the point on its under side, as at *r*, Fig. 6.

In order that the wheel with its wings may move sensitively and smoothly, with as little friction as possible, they are made (as is also the lining of the case) of some such light non-corrosive material as hard rubber, celluloid, &c., and to secure the prompt dropping of these light wings I form a chamber, *c*, in the lower edge of the wings, and load it with mercury, lead, or other substance.

I do not claim, broadly, a water-meter having radially-hung wings, as this has been done before; but,

Having thus described my invention, what I claim as new is—

1. A water-meter consisting of a circular case, having an inlet and outlet and an inclined bottom, a rotating disk or wheel having triangular openings with radial bearings, and wings of a corresponding shape and size journaled in said bearings and adapted to fold up into the openings or drop down to form pistons, and a registering mechanism connected to said wheel, all combined substantially as shown and described.

2. The case having inlet C and outlet D, a bellied or curved incline, *d d'*, conical portion *d' e*, incline *e e'*, and horizontal portion *e' f*, in combination with a rotating wheel having radially-hung wings, as and for the purpose described.

3. The combination, with the case having inclined bottom, and the wheel arranged therein and having radial bearings, of the wings E, pivoted or hung radially in said wheel, and having their lower edges weighted or loaded, as described.

4. The meter-case having an inclined bottom and a vertical wall, *f d*, with opening *g* at the top of said wall, in combination with the rotating wheel having radially-hung wings, as described.

5. The combination, with the case having inclined bottom and upper level, *e' f*, of the rotating wheel with radially-hung wings and the top plate having cut-away space *r*, as and for the purpose described.

FRANKLIN T. GILBERT.

Witnesses:
SOLON C. KEMON,
CHAS. A. PETTIT.