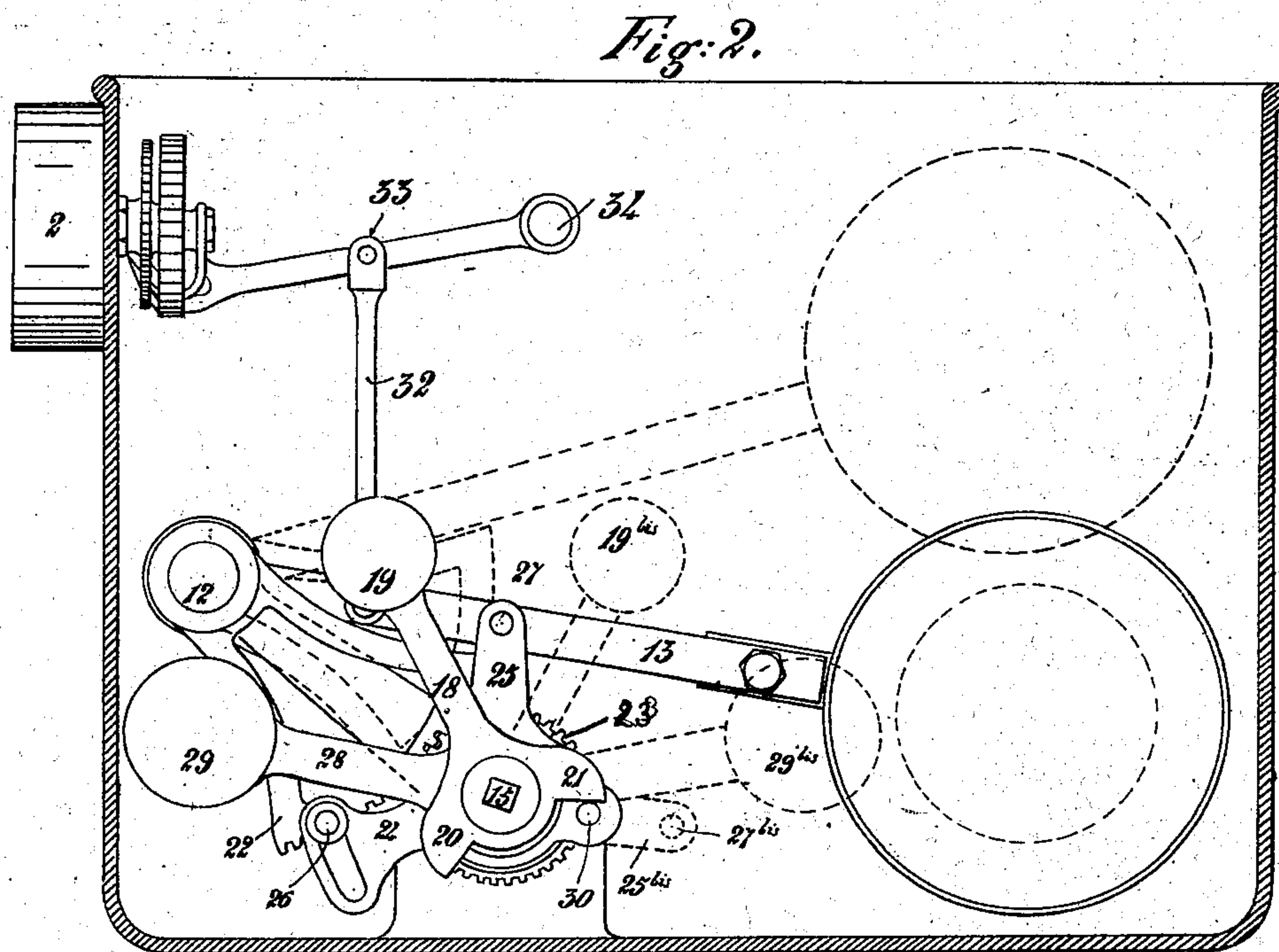
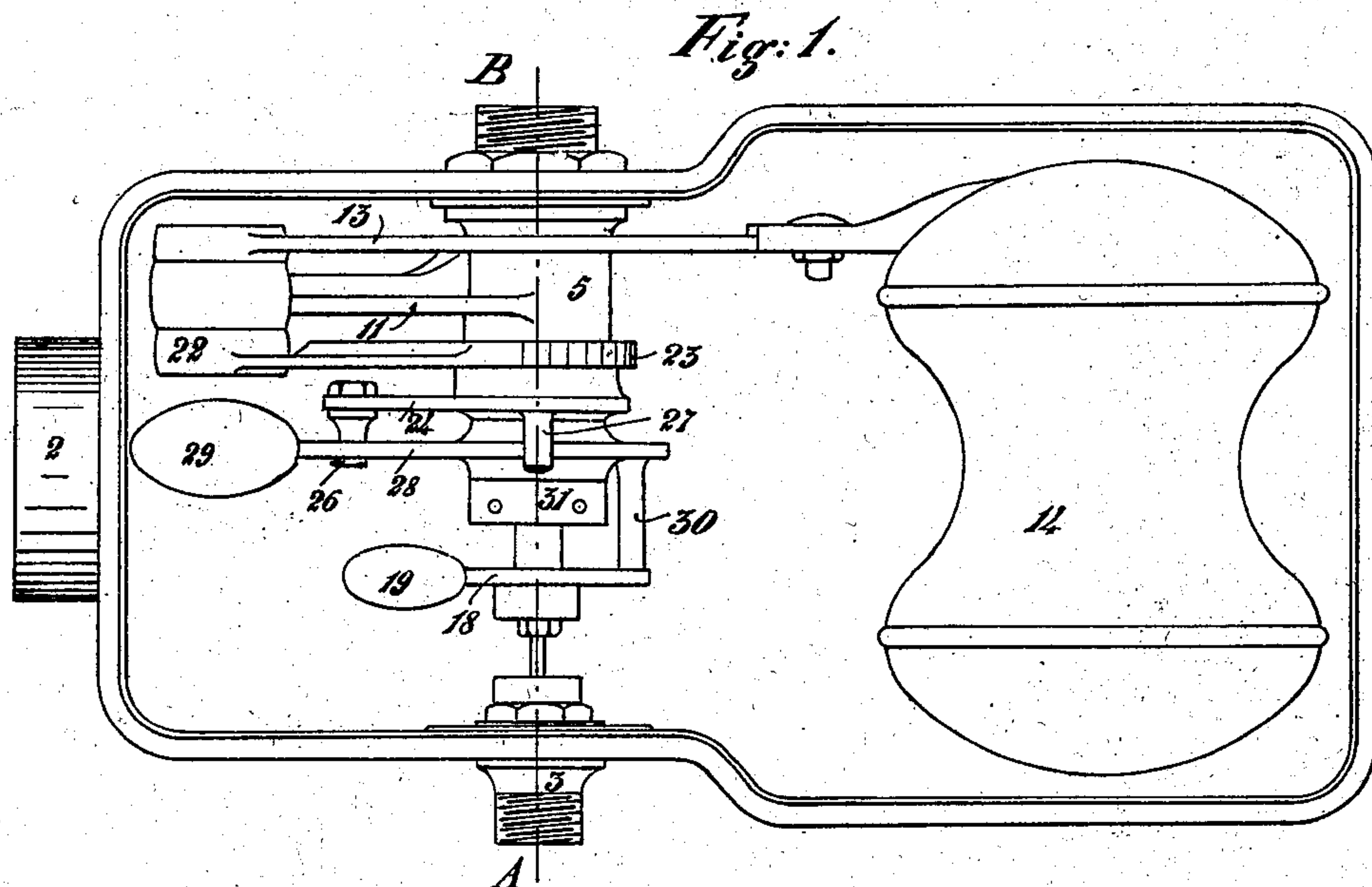


ENRICO GALLO FU GIUSEPPE.
SELF ACTING LIQUID METER.

APPLICATION FILED DEC. 10, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

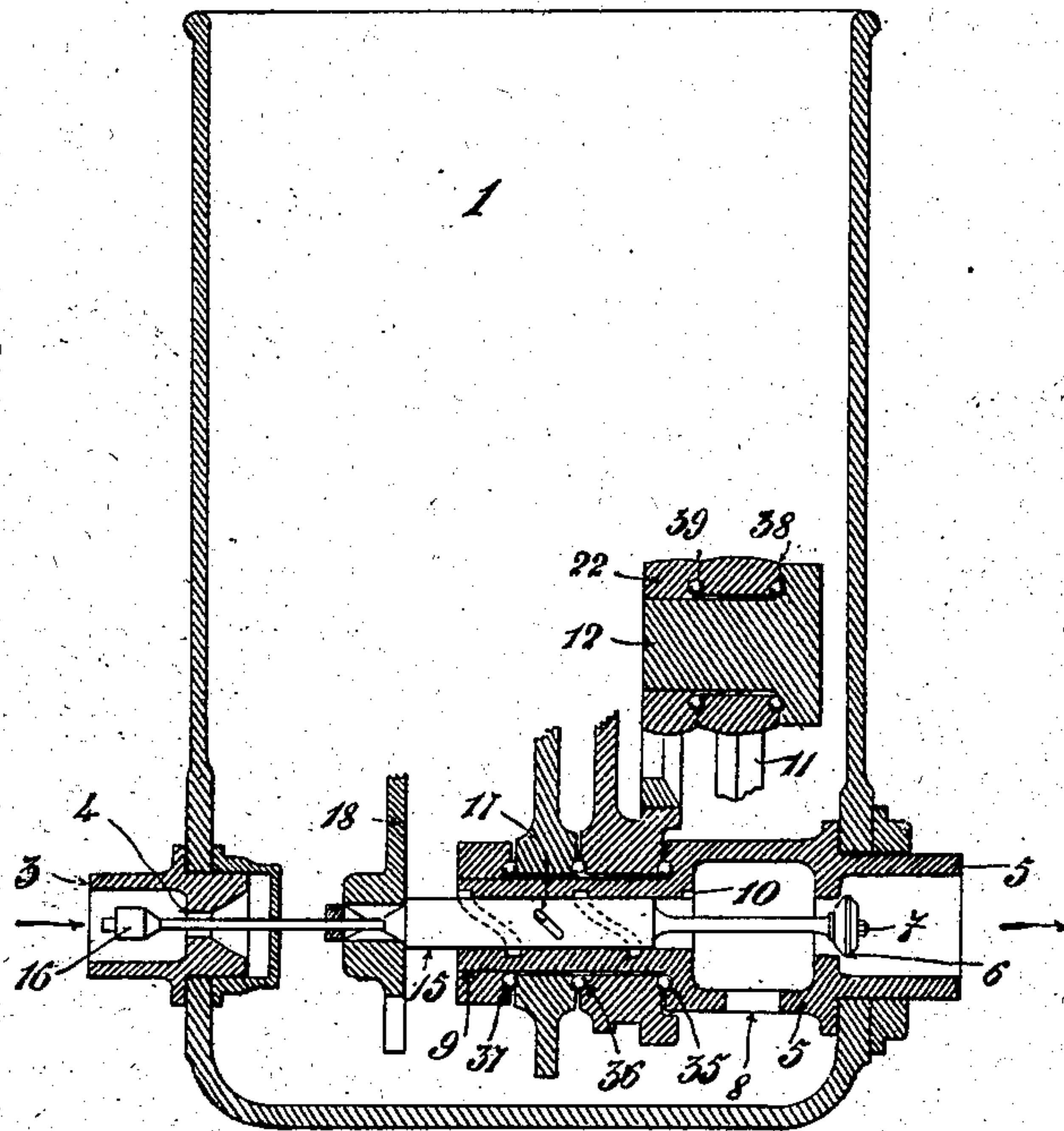
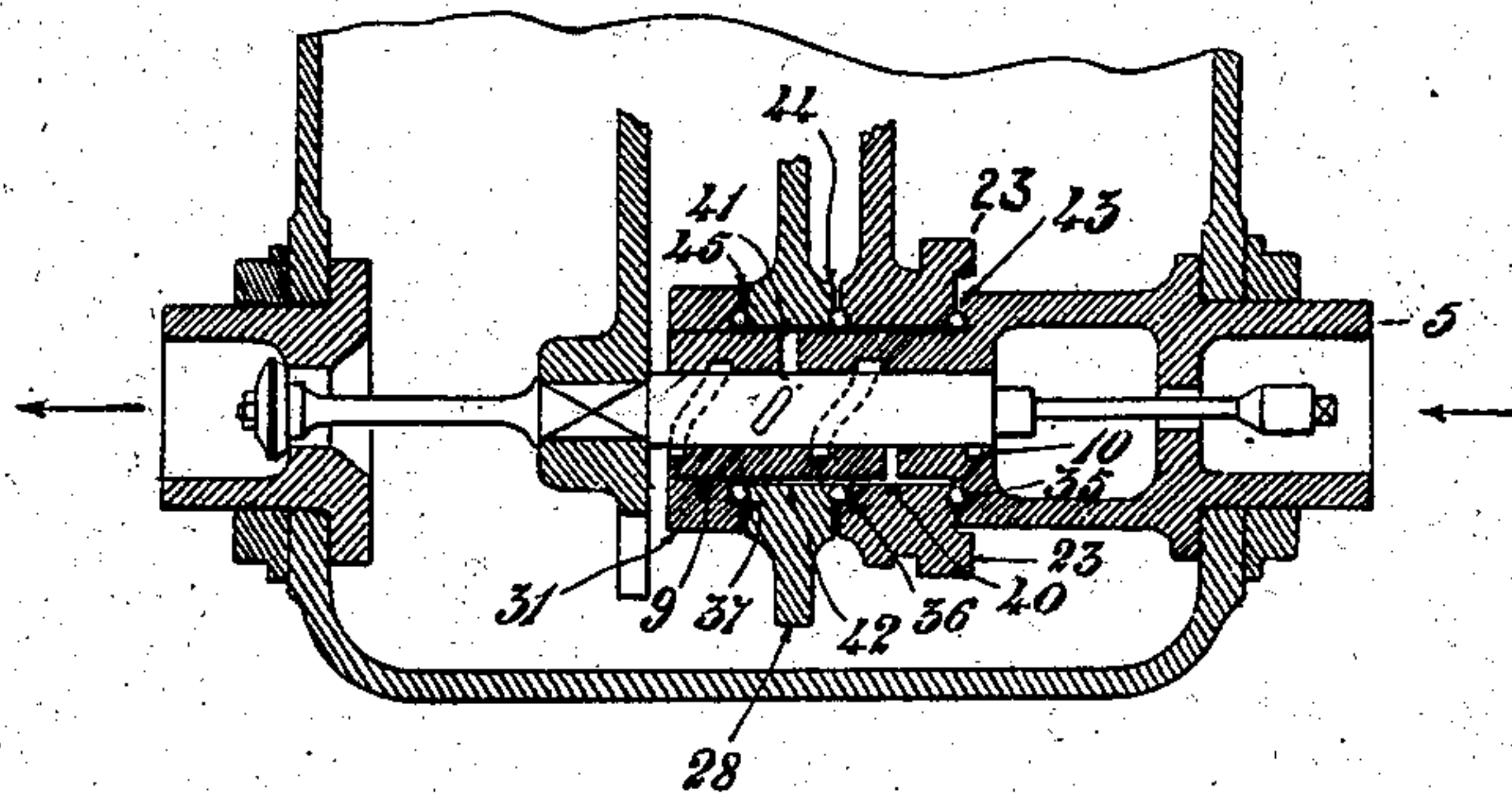


Fig. 4.



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UNITED STATES PATENT OFFICE.

ENRICO GALLO FU GIUSEPPE, OF BUSALLA, ITALY.

SELF-ACTING LIQUID-METER.

SPECIFICATION forming part of Letters Patent No. 730,250, dated June 9, 1903.

Application filed December 10, 1902. Serial No. 134,636. (No model.)

To all whom it may concern:

Be it known that I, ENRICO GALLO FU GIUSEPPE, a subject of the King of Italy, residing at Busalla, in the Province of Genoa, Italy, have invented a new and useful Improvement in Self-Acting Liquid-Meters; and I do hereby declare the following to be a full, clear, and exact description of the same.

The object of the present invention is to provide means for preventing that any quantity of a liquid, no matter how little, may be poured out from pipes or other vessels wherein it is contained without first being measured and recorded. This aim is obtained by means of a metal vessel, through which the liquid is allowed to flow at intervals by an inlet and an outlet valve, such valves operating at the same time in opposite sense and automatically under the action of two levers actuated by a float.

Referring to the annexed drawings, wherein the invention is shown with all its particulars, Figure 1 is a top view of the apparatus; Fig. 2, a side view seen from the inlet valve. Fig. 3 is a section on line A B of Fig. 1, wherein for clearness sake some parts of the mechanism are also shown in detail. Fig. 4 is a modification of the apparatus.

The apparatus consists, Figs. 1, 2, and 3, of a vessel 1, provided with the two circular openings *a*, to which are fixed two mouthpieces 3 and 5, one for the admission and the other for the discharge of the liquid, such vessel being also supplied at its upper end with a counter 2.

The openings 4 of the inlet-mouthpiece 3 act at the same time as the seat of the inlet-valve 16. The openings 6 of the discharge-mouthpiece 5 are the seat of the discharge-valve 7. Such mouthpiece 5 bears an interval extension forming a cylindrical tube wherein is provided a hole 8 for the passage of the liquid from the vessel to the aforesaid discharge-valve. Said mouthpiece is also provided with an adjoint piece 9, in the interior of which is cut a helicoidal groove 10, running on its whole length. On the outside the same mouthpiece 5 is provided with an arm 11, serving as a bearing for the pivots 12 of the rod 13 of the float 14.

The valve-spindle 15 consists of a metal cylinder whose diameter is the same as that

of the inside boring of the adjoint piece 9, wherein it runs and from which it is supported. Said spindle is provided at one end with a pin bearing the valve 7 and at the other end with a small screwed hole wherein is screwed the valve-spindle 16. A small pivot 17, secured on that part of the rod coming in contact with the adjoint piece 9, penetrates into the helicoidal groove and runs freely into it. On the valve-rod is mounted, moreover, a lever-arm 18, bearing the weight 19. The hub of this arm is provided with two catches 20 21. At the extremity of the pivot 12 is fastened a toothed segment 22, gearing with a wheel 23, which is loose on the support 9. The toothed wheel 23 has two wings 24 and 25, to which are fixed the pivots 26 and 27. The distance between these two pivots may be varied by causing the pivot 21 to slide within a groove formed in the wing 24. Around the support 9 rotates a lever 28, bearing at one end a weight 29 and at the other end a pivot 30, which engages with the catches 20 and 21 of the hub of the lever-arm 18.

All the pieces situated on the support 9 are checked by a stop-ring 31. On the rod 13 stands the lever 33, which is in connection with the lever 33, commanding the counter 2. The lever 33 can rotate on the pivot 34, which is fixed on the wall of the vessel. The small spheres 35, 36, 37, 38, and 39, placed between the rotating parts, serve to diminish the friction.

It will now be easily understood the manner in which the meter works. When the vessel is empty, the inlet-valve 16 is out of contact with its seat 4, thus permitting the liquid to flow. On the contrary, the valve 7 is at the same time in contact with its seat and closes hermetically the outlet 6. In consequence of the progressive admission of the liquid the float 14 will gradually rise and start in its ascensional movement the toothed segment 22 and the wheel 23. Then the pivot 26 causes the lever-arm 28, with the weight 29, to rotate, and when such arm has surpassed the vertical line it falls on the opposite side in the position 29^{bis}. (Shown by dotted lines.) In consequence of this the pivot 30, operating on the catch 20 of the lever-arm 18, causes the said lever-arm and its weight 19 to rotate

until they reach the position 19^{bis}. (Shown by dotted lines.) The valve-rod 15 is thus compelled to rotate and in consequence of the helicoidal groove 10 and of the pivot 17 it is also displaced in the longitudinal sense. It follows that the valve 16 will place itself on its seat, thus closing the inlet, while the valve 7 at the other end leaves its seat, thus allowing free discharge of the liquid, whereupon the progressive emptying of the vessel and the relative lowering of the float takes place. The float by means of the toothed wheel 23 and of the pivot 27, which is in the position 27^{bis}, (shown by dotted lines,) impresses to the lever-arm 28, together with the weight 29, which latter is at 29^{bis}, a backward movement. As soon as the weight 29 has surpassed the vertical line it falls on the opposite side, and the pivot 30, acting on the catch 21 of the lever-arm 18, impresses a backward movement also to said lever-arm, with the weight 19, which is at 19^{bis}. This causes a contrary rotary motion to the valve-spindle 15, and by means of the helicoidal groove 10 and the pivot 17 the closing of the outlet 6 and the opening of the inlet 4. The liquid then enters the vessel and the operation takes place again continuously until the liquid finds the necessary space for flowing out of the vessel.

The watch-work of the counter is operated by means of rods 13 32 33, which follow the movement of the float.

It is evident that modifications of constructions and of details of the invention may be made without departing therefrom. Fig. 4 is a sectional view of one of these modifications of construction having for its object to provide for the automatic cleansing of the most important moving parts of the apparatus, especially when used with such kinds of waters which are liable to deposit sediments.

The modified apparatus is not provided with the hole 8. (Shown in Fig. 3.) It is instead provided with the holes 40 41 in the support 9 in correspondence with the groove 10. The movable parts—viz., the hub of the toothed wheel 23 and the hub of the lever 28—are kept apart from the piece 5, the stop-ring 31, and the support 9 by means of the small spheres 35 36 37, thus forming the spaces 42 43 44 45.

The boring with the helicoidal groove is left-handed instead of right-handed, as in the first instance, and the valves change their respective places.

In the operation of the modified apparatus the liquid enters the vessel through the opening of the valve 7, the helicoidal groove 10, the holes 40 41, and the spaces 42 43 44 45. The discharge of the vessel then takes place through the opening of the valve 16. The current thus produced between the parts in

motion of the apparatus causes a continuous cleansing of the same and prevents the stopping of the apparatus even when, as before stated, the liquid to be measured is not clear.

I claim—

1. In a measuring vessel, a float-lever, a segment rocked by the movement of said lever, a gear meshing with said segment, arms connected with said gear, a weighted arm adapted to be alternately moved by said arms in opposite directions, a second weighted arm, a loose connection between said weighted arms, and inlet and exit valves for the measuring vessel having operating connections to said second weighted arm, substantially as described.

2. In a measuring vessel, a float-lever, a segment operatively connected thereto, a gear meshing with said segment, a pivoted arm carrying a weight, arms connected with the gear carrying projections extending on opposite sides of said pivoted arm, a second pivoted and weighted arm, a projection connected with the first-named pivoted arm and adapted to alternately engage lugs on the second pivoted arm, and a double-acting valve controlled by the movement of said second pivoted arm, substantially as described.

3. In combination, a vessel, a tubular plug carried by one wall thereof carrying a bearing-arm, a float-lever pivoted in said bearing-arm, a segment operatively connected to said float-lever, a gear journaled on said plug and meshing with said segment, arms extending outward from said gear at an angle to each other, a weighted arm pivotally mounted on said plug, and adapted to be oscillated by said arms of the gear, a valve-stem journaled in said plug having a helical spline connection therewith, a weighted arm rigidly connected with said valve-stem, and inlet and outlet valves connected with said valve-stem, substantially as described.

4. In combination, a vessel, a tubular plug in the wall thereof, a valve-stem mounted in said plug, inlet and outlet valves carried by longitudinal extensions of said stem, said valves controlling oppositely-located inlet and exit openings, and one of said openings being through the end of the plug, means whereby the rotation of the valve-stem imparts longitudinal movement to the same, a weighted arm rigidly connected to the valve-stem, and float-controlled mechanism for oscillating said weighted arm.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ENRICO GALLO FU GIUSEPPE.

Witnesses:

W. MENEDITTI,
A. ROZZI.