No. 638,657. Patented Dec. 5, 1899.

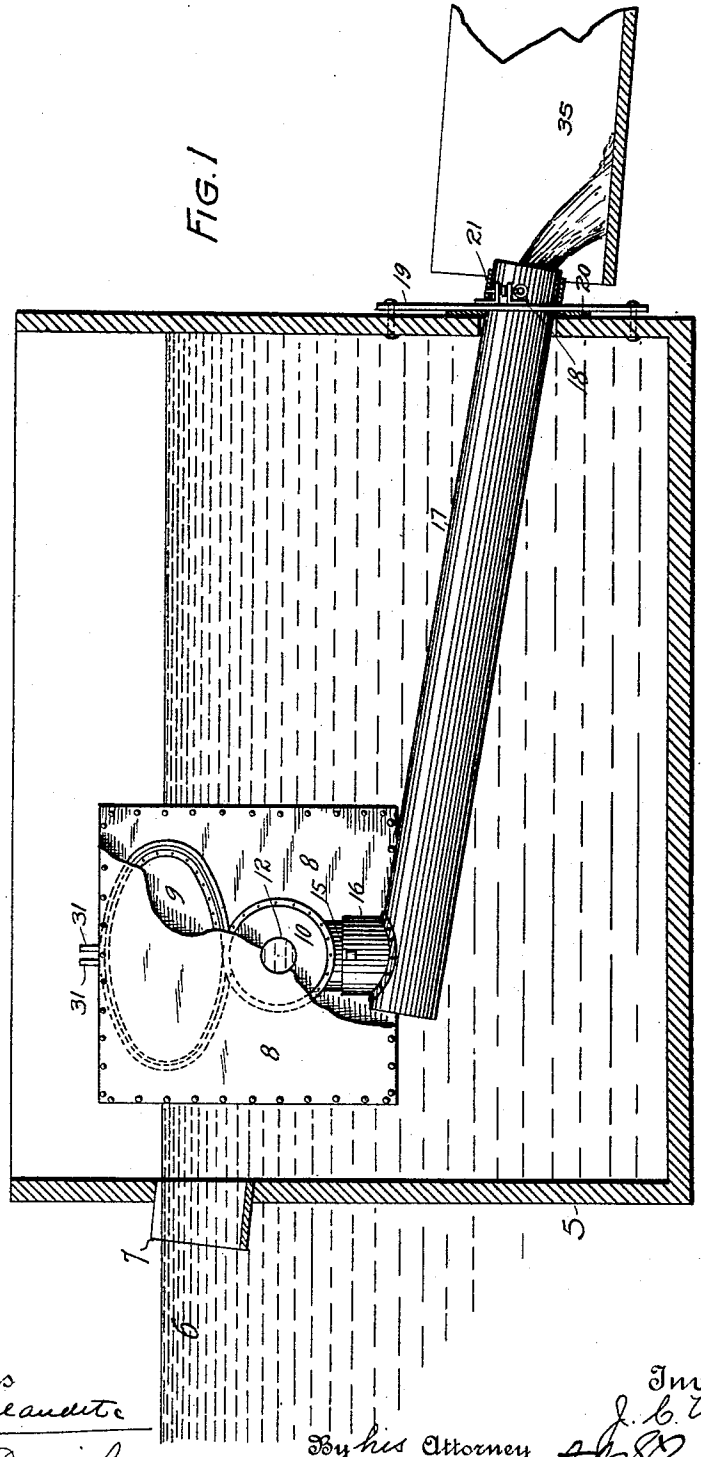
J. C. ULRICH.

AUTOMATIC WATER METER.

(Application filed Jan. 9, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1



Witnesses
Nellie G. Daniels

Inventor
J. C. Ulrich
By his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 638,657. Patented Dec. 5, 1899.

J. C. ULRICH.

AUTOMATIC WATER METER.

(Application filed Jan. 9, 1899.)

(No Model.) 2 Sheets—Sheet 2.

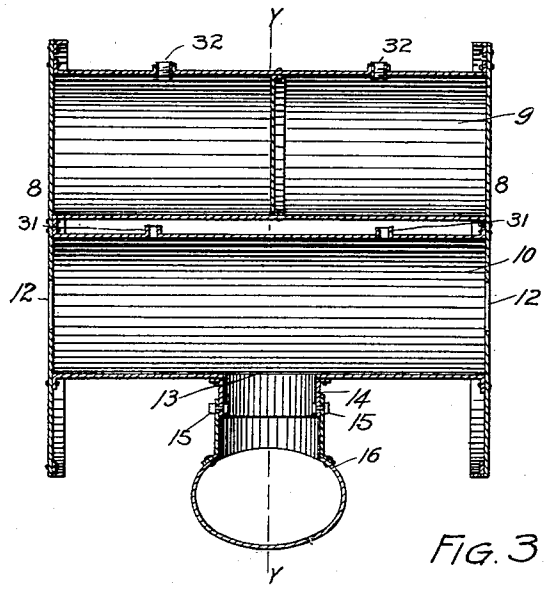


FIG. 3

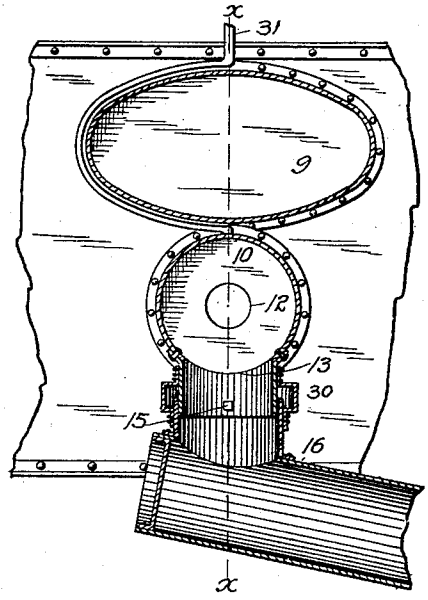


FIG. 2

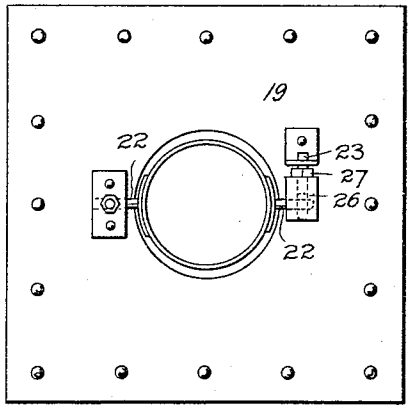


FIG. 4

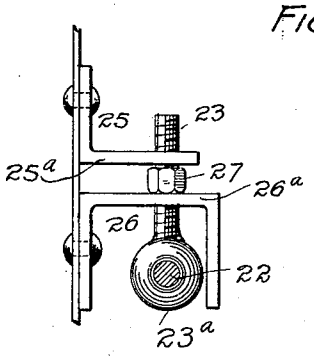


FIG. 5.

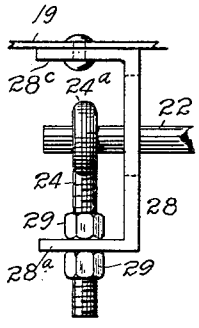


FIG. 6.

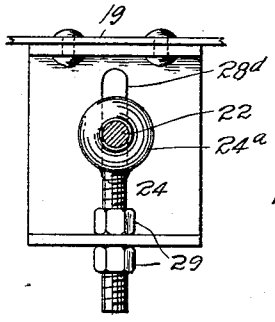


FIG. 7

Witnesses
P. J. Coleman
Nellie G. Daniels

Inventor
J. C. Ulrich

By his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN C. ULRICH, OF DENVER, COLORADO.

AUTOMATIC WATER-METER.

SPECIFICATION forming part of Letters Patent No. 638,657, dated December 5, 1899.

Application filed January 9, 1899. Serial No. 701,635. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ULRICH, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Water-Meters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in automatic water-meters, my object being to provide a device of this class which shall be simple in construction, economical in cost, reliable, durable, and efficient in use; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 illustrates my improved apparatus located in a box communicating with a reservoir or other source of supply, the box being shown in section and one of the end walls of the apparatus being partly broken away. Fig. 2 is a section taken through the apparatus on the line *y y*, Fig. 3. Fig. 3 is a section taken on the line *x x*, Fig. 2. Fig. 4 illustrates the plate through which the outlet extremity of the discharge-conduit passes, the latter being shown in place. Fig. 5 is an edge view of the plate, illustrating one of the adjustable eyebolts, the parts being shown on a larger scale. Fig. 6 is a top view of the other adjustable eyebolt. Fig. 7 is a side view of the same.

Similar reference characters indicating corresponding parts in the views, let the numeral 5 designate a box which communicates with the reservoir 6 or other source of supply by means of an opening 7. In this box is placed a floating structure comprising end walls 8, an air-tight hollow float 9, and a tank 10, having end openings 12 formed in the walls 8, which form the ends or heads of the float 9 and the tank 10. The tank 10 is provided with an outlet-opening 13, surrounded by a depending thimble 14, to which is hinged, as shown at 15, the elbow extremity 16 of a conduit 17, whose opposite extremity, or that remote from the elbow 16, passes through an opening 18, formed in the box 5. To the outside of the box is secured a plate 19, having an opening registering with the opening 18 and through which the extremity of the conduit also passes. A housing 21, composed of flexible waterproof material, is slipped over the protruding extremity of the conduit, passed through the opening in the plate, and spread out around the conduit between the plate 19 and the side of the box, forming a sort of washer, which is held securely in place by fastening the plate to the box. The portion of the housing 21 engaging the conduit outside of the plate 19 is secured to the conduit by winding it tightly with cord or other suitable material. This housing in connection with the plate 19 forms a water-tight joint where the conduit passes through the wall of the box or receptacle. This flexible housing permits the necessary movement of the conduit as the floating structure rises and falls with the change of level of the water in the reservoir or other source. This outlet end of the conduit is provided with trunnions 22, journaled in eyebolts 23 and 24, respectively. These eyebolts are mounted on the plate 19. The bolt 23 occupies a vertical position and is supported on two angle-brackets 25 and 26, secured to the plate 19. This bolt passes through registering openings formed in the horizontal parts 25^a and 26^a of the said angle-brackets and is threaded to engage a nut 27, located between the parts 25^a and 26^a, only sufficient space being left to allow the nut to turn freely. The eye extremity 23^a of the bolt is lowermost and forms the support for the trunnion 22 on one side of the conduit. By turning the nut 27 the trunnion may be raised or lowered, as desired, and the position of the floating structure regulated, since the trunnion-axis of the one extremity of the conduit is parallel with the hinged axis of its opposite extremity.

The eyebolt 24 occupies a horizontal position and is attached to an angle-bracket by means of two nuts 29, screwed on the bolt and occupying positions on opposite sides of a ver-

tical flange 28 of the bracket. This angle-bracket is secured to the outlet-plate 19 by means of rivets passed through the flange 28^c, which is parallel with the flange 28^a. The trunnion 22 of the conduit passes through an elongated opening 28^d, formed in the angle-bracket 28, and also passes through the eye 24^a of the bolt. By adjusting the nuts 29 the floating structure may be shifted horizontally for the purpose of regulating its position in the brackets 5.

The hinged joint 15, forming the connection between the elbows of the conduit and the thimble 14 of the floating structure, is surrounded by a waterproof flexible housing 30, whose extremities are suitably secured to the connected parts. This housing forms a water-tight joint and at the same time permits the necessary hinge movement between the parts.

The air is allowed to enter the tank 10 by way of tubes 31, communicating with the tank and passing around the float 9, the upper extremities of the tubes rising above the water-line, where they are open, thus maintaining normal atmospheric pressure in the cylinder 10 above the water.

From the foregoing description it will be understood that my improved floating structure will always sink into the water to the same depth below the surface of the water in the reservoir or supply source. Hence as the water fluctuates in the source the floating structure rises and falls accordingly, thus keeping the pressure-head above the orifice 12 uniform and maintaining a uniform discharge by way of the conduit 17 into the flume or waterway 35. There are also openings 32 in the top of the float for the purpose of introducing water, which causes the apparatus to sink to the proper depth. In Fig. 3 these openings are shown closed by suitable screw-plugs.

Having thus described my invention, what I claim is—

1. In an automatic water-meter, the combination with a box communicating with the supply source, of a structure located in the box and comprising a hollow float, a tank rigidly secured to the lowest part of the float, vertical walls inclosing the ends of the float and tank, said walls being provided with openings to permit the water to enter the ends of the tank, and a conduit, one extremity of which is hinged to the tank, while the other extremity passes through an opening formed in the box in which the conduit extremity is movable.

2. In an automatic water-meter, the combination with a box communicating with the supply source, of a structure located in the box and comprising a hollow float, a tank rigidly secured to the bottom of the float, vertical walls closing the ends of the float and tank, and open to permit the water to enter the ends of the tank, a conduit, one extremity of which is hinged to the tank while the other extremity passes through an opening formed in the box, and suitable means for forming water-tight movable joints, where the conduit is connected with the tank and where the conduit passes through the box.

3. In an apparatus of the class described, the combination with a suitable receptacle communicating with the supply source, of a structure located therein and comprising a hollow float, a tank rigidly attached to the float, vertical walls closing the ends of the float and tank and open to permit the water to enter the ends of the tank, a conduit hinged to the tank and communicating therewith, the opposite extremity of the conduit passing through an opening formed in the wall of the receptacle, means for forming water-tight joints where the conduit is connected with the tank and also where it passes through the wall of the receptacle, the arrangement being such as to permit of the necessary movement of the conduit as the float and tank rise and fall with the fluctuations of the water.

4. The combination with a water-receptacle, of a float and a tank rigidly connected together, the tank being open to receive water, the tank and float being located within said receptacle, a conduit movably connected with the tank and communicating therewith, the discharge extremity of the conduit passing through an opening formed in the wall of the receptacle, and means for turning the conduit on its longitudinal axis for the purpose of regulating the position of the tank and float.

5. The combination with a water-receptacle, of a hollow float and a tank located in said receptacle, vertical walls closing the ends of the float and tank and rigidly connecting them together, the said walls having openings to allow the water to enter the ends of the tank, and a discharge conduit connected with the tank and adapted to move on a horizontal axis, the outlet-extremity of the conduit passing through the wall of the receptacle and trunnioned on a horizontal axis.

6. The combination with a water-receptacle, of a float and a tank rigidly connected together and located in said receptacle, a discharge-conduit connected with the tank and adapted to move on a horizontal axis, the outlet extremity of the conduit passing through the wall of the receptacle and trunnioned on a horizontal axis, and means for imparting a partial rotation to the conduit on its longitudinal axis for the purpose of regulating the position of the tank and float.

7. The combination with a water-receptacle, of a float and a tank rigidly secured together and located in said receptacle, a discharge-conduit connected with the tank and adapted to move on a horizontal axis, the outlet extremity of the conduit passing through the wall of the receptacle and trunnioned on a horizontal axis, and means for imparting a

limited movement to the conduit on the line of an axis extending at right angles to its longitudinal axis.

8. The combination with a water-receptacle, of a float and a tank rigidly secured together and located in said receptacle, a discharge-conduit connected with the tank and adapted to move on a horizontal axis, the outlet extremity of the conduit passing through the wall of the receptacle and trunnioned on a horizontal axis, means for imparting a partial rotation to the conduit on its longitudinal axis and means for imparting a limited movement to the conduit on the line of an axis extending at right angles to its longitudinal axis.

9. The combination with a water-receptacle, of a float and a tank rigidly secured together and located in said receptacle, a discharge-conduit connected with the tank and adapted to move on a horizontal axis, the outlet extremity of the conduit passing through an opening in the wall of the receptacle and provided with trunnions, adjustable eyebolts mounted on a stationary support, the eyes of the bolts being engaged by the trunnions of the conduit.

10. The combination with a water-receptacle, of a float and a tank rigidly secured together and located in said receptacle, a discharge-conduit connected with the tank and adapted to move on a horizontal axis, the outlet extremity of the conduit passing through an opening in the wall of the receptacle and provided with trunnions, adjustable eyebolts mounted on a stationary support, the eyes of the bolts being engaged by the trunnions of the conduit, one of the bolts occupying a vertical and the other a horizontal position, whereby the conduit may be moved both on the line of its longitudinal axis and on the line of an axis extending at right angles to its longitudinal axis, for the purpose of regulating the position of the float and the tank.

11. The combination with a water-receptacle, of a float and a tank located therein and rigidly connected together, a vent-tube communicating with the tank and passing upward above the water-line, and a discharge-conduit connected with the tank and passing through the wall of the said receptacle.

12. The combination with a water-receptacle, of a floating structure located therein, and provided with a tank open to receive the water, a conduit movably connected with the tank and communicating therewith, its outlet extremity passing through an opening in the wall of the receptacle, a plate attached to the said wall and having an opening in line with the opening in the wall, and a flexible waterproof housing surrounding the conduit and passed through the plate, where it is formed into a packing-washer held in place between the plate and the wall of the receptacle.

13. In an automatic water-meter, the combination with a water-receptacle communicating with the supply source, of a floating structure located in said receptacle and comprising a hollow float having an opening for the introduction of water to reduce and regulate the buoyancy of the float, a tank secured to the lowest part of the float, an opening in each end of the tank to permit the entrance of water from the receptacle, and a suitable outlet-conduit connected with the apparatus.

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

JOHN C. ULRICH.

Witnesses:
NELLIE G. DANIELS,
A. J. O'BRIEN.