

(No Model.)

M. FARRELL.
WATER TRAP FOR GAS MAINS, &c.

No. 565,970.

Patented Aug. 18, 1896.

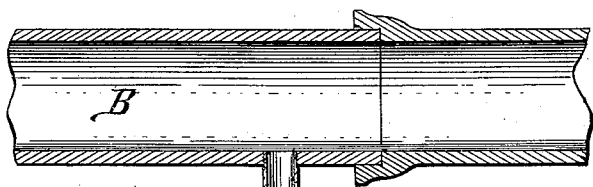


Fig. 1.

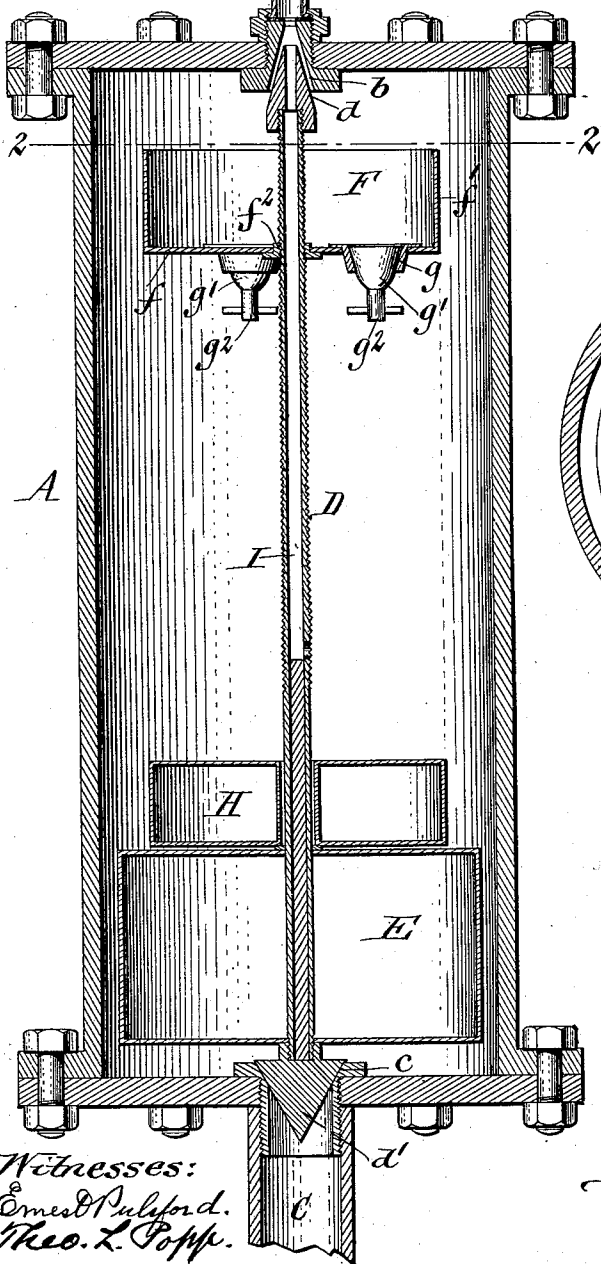
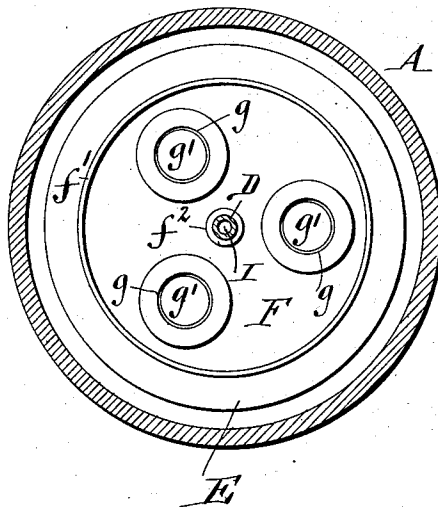


Fig. 2.



Witnesses:
Emad P. Palford.
Theo. L. Popp.

Michael Farrell
Inventor
By Wilhelm M. Popp
Attorneys.

UNITED STATES PATENT OFFICE.

MICHAEL FARRELL, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-THIRD
TO JOHN L. C. CRONYN, OF SAME PLACE.

WATER-TRAP FOR GAS-MAINS, &c.

SPECIFICATION forming part of Letters Patent No. 565,970, dated August 18, 1896.

Application filed May 15, 1896. Serial No. 591,698. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL FARRELL, a subject of the Queen of Great Britain, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates to that class of valves which permits water to be intermittently discharged from a chamber, such valves being employed, for instance, in water-traps for gas-mains, water-closet-flushing devices, and in pumps which supply air to beer-barrels.

The object of my invention is to produce a simple valve mechanism for this purpose which is reliable in its operation and which can be easily regulated.

In the accompanying drawings, Figure 1 is a vertical section of my improved valve mechanism, showing the same adapted for automatically discharging water from a gas-main. Fig. 2 is a horizontal section on line 2 2, Fig. 1.

Like letters of reference refer to like parts in the two figures.

A represents a water-chamber having its upper end connected with the gas-main B by an inlet-pipe *a*, which opens into the central portion of the upper head of the water-chamber.

C represents an outlet-pipe whereby the water is drained from the water-chamber into a sewer or elsewhere and which is connected with its inner end to the central portion of the lower head of the water-chamber. The water-chamber is provided around the inner ends of the water inlet and outlet pipes with inlet and outlet valve seats *b c*, respectively.

D represents a vertical valve-rod arranged centrally in the water-chamber and provided at its upper end with an inlet-valve *d*, which is adapted to bear against the inlet-valve seat; and at its lower end with an outlet-valve *d'*, which is adapted to bear against the outlet-valve seat. The relative position of the inlet and outlet valves is such that when one of these valves is open the other is closed.

E represents a main float, of any suitable construction, which is secured to the lower portion of the valve-rod and which is adapted to be raised and lowered by the rise and fall

of the water in the water-chamber, thereby operating the inlet and outlet valves accordingly.

F represents a weight or balancing pan which is adapted to be filled with water for holding the float in a depressed position and closing the outlet-valve until a sufficient quantity of water has collected in the water-chamber. This pan consists, preferably, of a horizontal bottom *f* and an upwardly-projecting marginal flange *f'*, and is adjustably secured to the upper portion of the valve-rod by a screw-nut *f²*, secured to the central portion of the bottom of the pan and engaging with the screw-threaded upper portion of the valve-rod. The bottom of the weight-pan is provided with a number of outlet-openings having valve-seats *g*, against which valves *g'* are adapted to bear for closing the outlet-openings. The valves are preferably conical and bear against their seats by gravity, and each valve is provided with a stem *g²*, which projects below the bottom of the pan.

H represents an auxiliary or releasing float whereby the water is released from the weight-pan for permitting the main float to rise and shift the inlet and outlet valves. This float slides vertically on the valve-rod between the main float and the weight-pan, and is supported in its lowermost position on the main float, while upon raising the same to the highest position it engages with the stems of the pan-valves *g'* and opens the latter for releasing the water in the weight-pan.

In the normal position of the parts the main and auxiliary floats are both in their lowermost position, the outlet-valve and pan-valves are closed, and the inlet-valve is open, as shown in Fig. 1. In this position of the parts the water in the gas-main passes slowly from the latter through the inlet-pipe and into the weight or balancing-pan until the latter is entirely filled, after which the water flows over the flange of the pan and fills the water-chamber below the pan. The main float is prevented from rising immediately with the water as the latter fills the water-chamber owing to the preponderating downward pressure of the water in the balancing-pan, thereby causing the outlet-valve to be held shut

and the inlet-valve to be held open until the desired quantity of water has entered the water-chamber. As the water rises in the water-chamber the auxiliary float, which is free to move vertically, rises with the water until it engages with the stems of the pan-valves and opens the same, thereby permitting the water to escape from the pan into the water-chamber. The instant the main float is relieved from the weight of the water in the balancing-pan it is raised by the water until the inlet-valve is closed and the outlet-valve is opened, thereby permitting the water to escape from the water-chamber into the sewer, and also preventing water from passing from the gas-main into the balancing-pan while the water-chamber is being emptied. As the level of the water in the chamber is lowered by escaping from the latter the auxiliary float also descends and permits the pan-valves to close, but the main float does not descend until the level of the water has reached the main float, after which the latter descends with the water-level until the outlet-valve is closed and the inlet-valve opened, thereby restoring the normal position of the parts. This operation takes place whenever the water-chamber has been filled up to the desired point.

By adjusting the balancing-pan vertically on the valve-rod the apparatus can be regulated so as to discharge the water from the chamber when more or less has accumulated in the chamber. Upon shifting the pan downwardly on the valve-rod the valve mechanism will be operated when a comparatively small quantity of water has accumulated in the chamber, while upon shifting the pan upwardly a correspondingly larger volume of water must enter the chamber before the valve mechanism is operated, thereby enabling the intervals between the discharges or the quantity of the discharges to be regulated as desired.

I represent a by-pass or passage formed lengthwise in the valve-rod and opening with its upper end through the inlet-valve above its face and opening with its lower end laterally through the valve-rod below the balancing-pan. While the inlet-valve is closed and the water is being discharged from the chamber, the water from the gas-main is conducted through the inlet-valve and directly into the water-chamber, thereby avoiding the delivery of any water into the balancing-pan during the discharging operation and enabling the outlet-valve to be held open fully during this time. This by-pass also relieves the inlet-valve from the pressure of the gas in the main and prevents the same from unseating the inlet-valve and partly closing the outlet-valve. The inlet and outlet valves are preferably conical and of such length that they are never wholly removed from their seats upon shifting the valve-rod lengthwise, whereby these valves serve as guides for the valve-rod and connecting parts. In this applica-

tion of my automatic valve mechanism the water in the gas-mains is automatically discharged from the mains without permitting the gas to escape, thereby keeping the mains perfectly dry at all times.

I claim as my invention—

1. The combination with the water-chamber having an inlet and an outlet, of an outlet-valve controlling said outlet, a main float connected with said valve, a balancing-pan arranged adjacent to said inlet and connected with the main float and the outlet-valve, a valve arranged on said pan and an auxiliary float adapted to engage with the valve of the balancing-pan, substantially as set forth.

2. The combination with the water-chamber having an inlet and an outlet, of an inlet-valve controlling said inlet, an outlet-valve controlling said outlet, a main float connected with said valves, a balancing-pan arranged adjacent to said inlet and connected with said float and valves, a valve arranged on said pan and an auxiliary float adapted to engage with the valve of the balancing-pan, substantially as set forth.

3. The combination with the water-chamber having an inlet and an outlet, of a vertical rod provided at its lower end with an outlet-valve which controls said outlet, a main float connected with the lower portion of said rod, a balancing-pan connected with the upper portion of the valve-rod adjacent to said inlet and provided with a valve and an auxiliary float guided on said rod between the main float and balancing-pan and adapted to engage with the valve of the balancing-pan, substantially as set forth.

4. The combination with the water-chamber having an inlet and an outlet, of a vertical rod provided at its lower end with an outlet-valve which controls said outlet, a main float connected with the lower portion of said rod, a balancing-pan arranged adjacent to said inlet and capable of vertical adjustment on said rod, a valve arranged on said pan and an auxiliary float guided on said rod and adapted to engage with the valve on the balancing-pan, substantially as set forth.

5. The combination with the water-chamber having an inlet and an outlet, of a vertical rod provided with an externally-screw-threaded upper end and with an outlet-valve at its lower end which controls said outlet, a main float connected with the lower portion of said rod, a balancing-pan arranged adjacent to said inlet and provided in its bottom with a screw-nut which engages with the threaded portion of said rod and with a valve-seat, a valve engaging with said seat and provided with a depending stem and an auxiliary float guided on said rod and adapted to engage with said stem for opening the valve of the balancing-pan, substantially as set forth.

6. The combination with the water-chamber provided with an inlet and an outlet in its upper and lower ends respectively, of an

inlet-valve which controls said inlet, an outlet-valve controlling said outlet, a main float arranged in the lower portion of the water-chamber, a balancing-pan arranged in the
5 upper portion of the water-chamber and provided with a valve, an auxiliary float arranged between the main float and the balancing-pan and adapted to engage with the valve of said pan, and a rod connected with the inlet and
10 outlet valves, the main float and the balancing-pan, and provided with a passage open-

ing with its upper end above the seat of the inlet-valve and opening with its lower end into the chamber below the balancing-pan, substantially as set forth.

Witness my hand this 20th day of April, 1896.

MICHAEL FARRELL.

Witnesses:

THEO. L. POPP,
CATHARINE ELMORE.