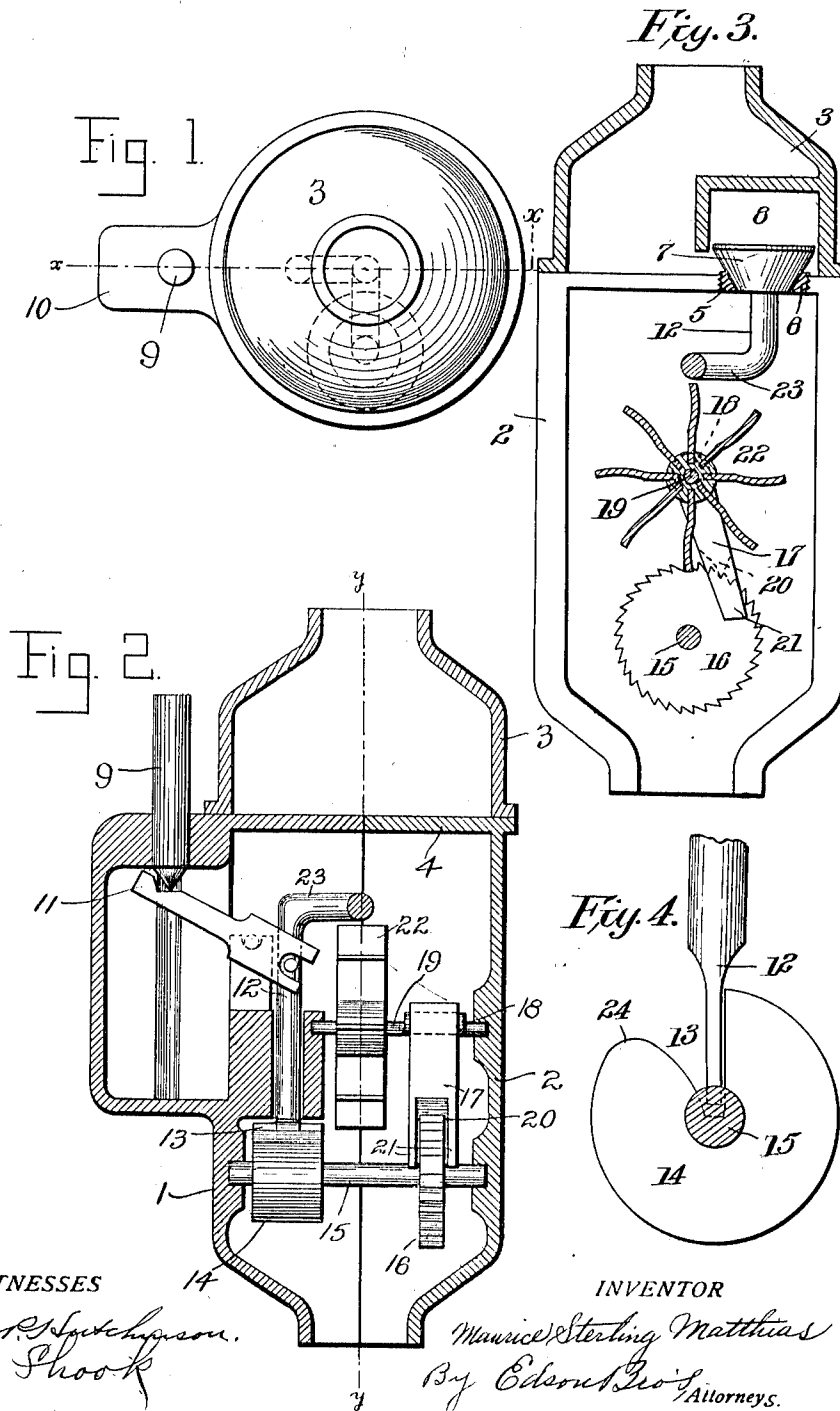


M. S. MATTHIAS.
 FLUSH VALVE.
 APPLICATION FILED NOV. 16, 1909.

1,012,394.

Patented Dec. 19, 1911.



WITNESSES

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UNITED STATES PATENT OFFICE.

MAURICE STERLING MATTHIAS, OF GALION, OHIO.

FLUSH-VALVE.

1,012,394.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed November 16, 1909. Serial No. 528,363.

To all whom it may concern:

Be it known that I, MAURICE STERLING MATTHIAS, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Flush-Valves; and I do hereby 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.

My invention relates to flush valves and has for its object to provide improved mechanism which will insure the valve's remaining open for the requisite period and its closing automatically at the end of that time. This mechanism is simple in construction and inexpensive.

The invention consists in the features of construction and combinations of parts hereinafter described and specified in the claim.

In the accompanying drawings illustrating the preferred embodiment of my invention: Figure 1 is a top plan view of a tank or reservoir containing the valve mechanism. Fig. 2 is a vertical section on the line $x-x$ of Fig. 1. Fig. 3 is a vertical section on the line $y-y$ of Fig. 2, and Fig. 4 is a detail view of the slotted drum engaged by the lower end of the valve stem.

I preferably construct the casing of the tank or reservoir of three castings, 1, 2 and 3, respectively, the first two of said castings forming the inclosure in which the operating parts of the valve are arranged while the other casting is superposed upon the others and constitutes a storage receptacle for the water before it is admitted to the lower inclosure. A partition 4 separates said upper or storage tank from the lower inclosure and in it is formed an opening 5 fitted with a bushing 6 constituting a seat for the valve 7. Said valve seat is arranged at one side or eccentrically of said partition, as illustrated in Fig. 3 and in dotted lines in Fig. 1, for the purpose hereinafter explained. The casting 3 is provided with a chamber 8 to receive the valve when it is raised, said chamber being open at the bottom to permit the flow to the opening when said valve is raised.

The push pin 9 is arranged in the extension 10 of the casting 1 and its inward extremity engages one end of an intermediately pivoted lever 11 which is pivotally

connected at its other end to the valve stem 12. The extremity of said valve stem is normally arranged in a slot 13 in the drum 14 which is mounted to turn with the shaft 15. Said shaft also carries a ratchet wheel 16 engaged by a dog 17 hung from a cam or eccentric 18 on another shaft 19 arranged above the shaft 15. Said dog has the usual pointed end 20 for engaging the teeth of the ratchet wheel, and on either side thereof has downward extensions 21 which serve to weight the dog and hold it constantly in engagement with the ratchet wheel. A water wheel 22 is mounted to turn with the shaft 19 and is positioned in the center of the lower inclosure so that its blades at one side are directly below the valve and in the path of the flow when said valve is opened. It will be understood that the bearings for the two shafts, the guide for the valve stem and the pivot bearing for the lever are all formed in the castings. The valve stem is offset, as at 23, to bring its lower portion into vertical alinement with the drum 14 which is arranged near one end of the shaft 15. The ratchet wheel is arranged near the other end of said shaft so that the central portion of the inclosure is left unobstructed below the water wheel except for the small middle part of said shaft. As illustrated in Fig. 4, one edge of the slot in the drum 14 is preferably rounded off, as at 24, so that the lower end of the valve stem will be guided or dropped gradually into the slot 13 avoiding the sudden jar which would result if it dropped abruptly into said slot.

The downward movement of the outer end of the lever 11 by means of the pin 9 raises the valve stem 12 opening the valve and withdrawing the lower extremity of said valve stem from the notch in the drum 14. The water entering through the valve opening and coming in contact with the blades of the water wheel immediately starts the shaft 19 to revolving which in turn causes the oscillation of the dog 17 by means of the cam 18. Said dog, as soon as it begins to work, acts upon the ratchet wheel 16 causing it and the shaft 15 to revolve. The drum 14, turning with said shaft 15, is, therefore, immediately turned so as to bring its notch or slot 13 out of alinement with the lower end of the valve stem so that when the pressure on the pin 9 which supports said valve pin is relieved, the latter comes in contact with the outer surface

of said drum and is supported in its raised position with the valve open until said drum has completed a revolution. As soon as the slot 13 again comes into alinement with the lower end of the valve stem, the latter will drop into it by force of gravity, suction and water pressure from above the valve causing said valve to close.

The length of time that the valve remains open which, of course, determines the amount of water which will be allowed to pass through the inclosure, may be varied to suit requirements by changing the eccentric or cam 18, whereby the dog is rendered capable of revolving the ratchet wheel faster or slower. This adjustment may also be obtained by varying the size of the ratchet wheel. Other changes in details may be made without departing from the spirit or sacrificing the advantages of my invention. I, therefore, do not limit myself to the exact construction and proportions herein described, but reserve the right to make such alterations therein as fall within the scope of the following claim.

I claim:—

In a device of the character described, the combination, with an inclosure having

inlet and outlet openings arranged respectively at its upper and lower ends, of a water wheel arranged centrally of said inclosure, said inlet opening being located near one side of the inclosure whereby it is in vertical alinement with only one side of said water wheel, a shaft arranged below said water wheel, a slotted drum and a ratchet wheel mounted on said shaft at the opposite sides of said water wheel, a valve for closing said inlet opening, a valve stem connected to said valve, and having an offset to pass around said water wheel, the lower end of said valve stem adapted to engage in the slot in said drum when the valve is closed, means to raise said valve stem so as to withdraw its lower end from the slot in the drum when the valve is opened, and an oscillating dog carried by the shaft of the water wheel and adapted to engage said ratchet wheel for the purpose specified.

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

MAURICE STERLING MATTHIAS.

Witnesses:

HENRY WALDMAN,
H. W. CLELAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."