No. 884,483. PATENTED APR. 14, 1908.

J. W. GRANTLAND.

AUTOMATIC PERIODIC FLUSHING APPARATUS.

APPLICATION FILED MAR. 13, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

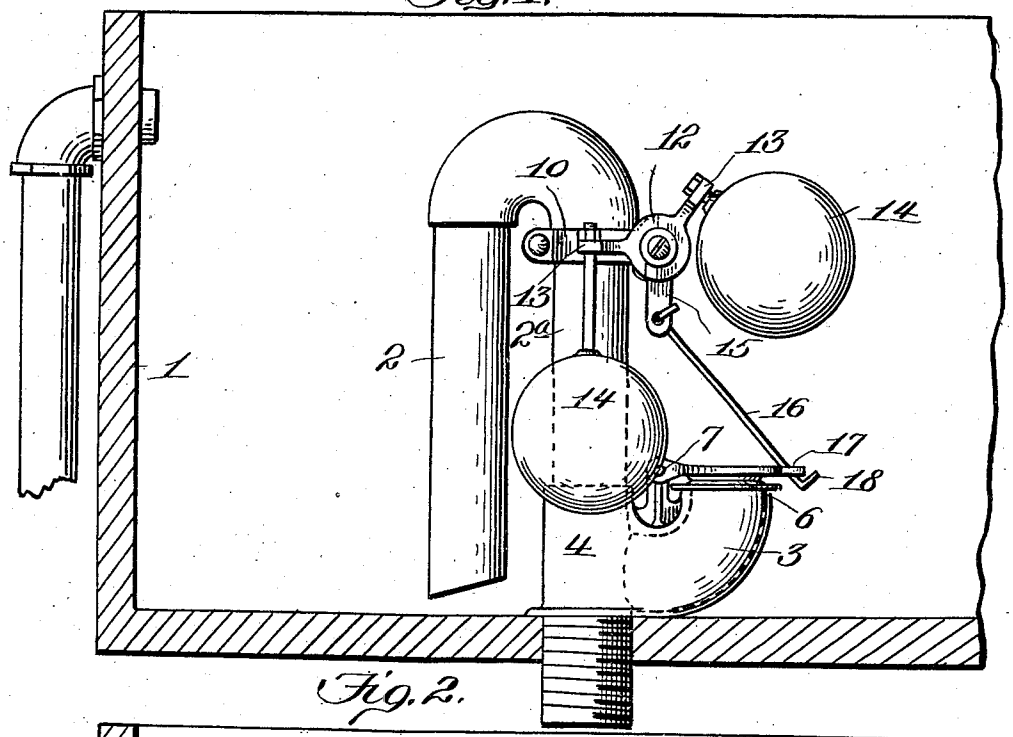
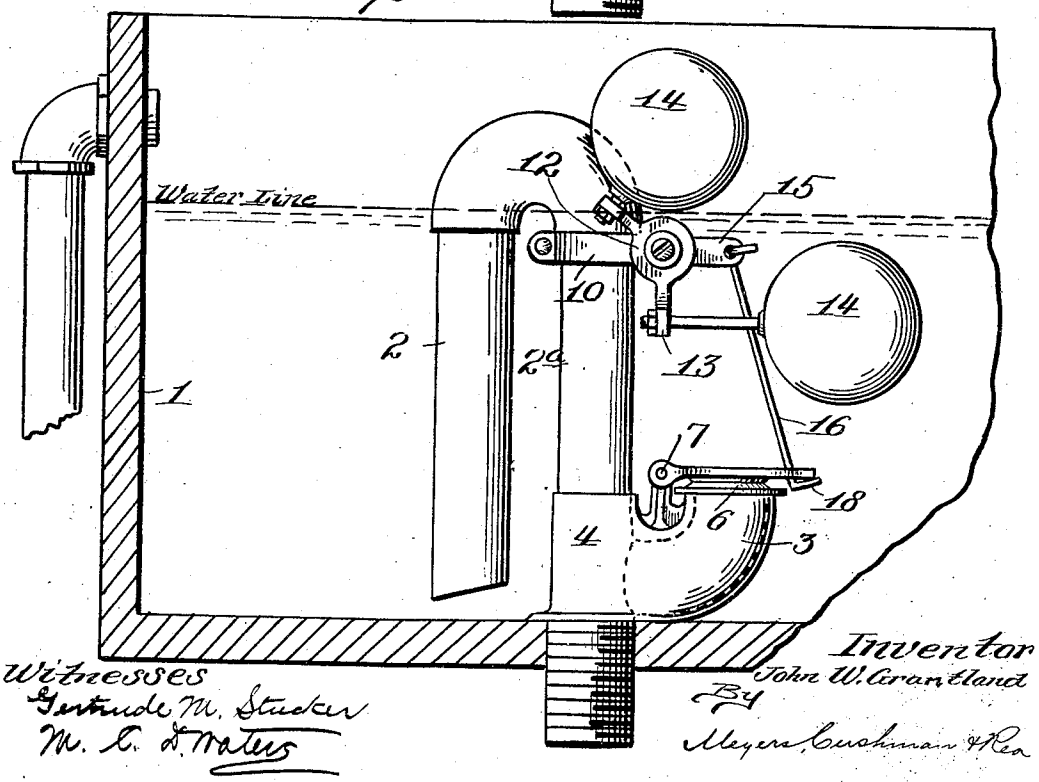


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

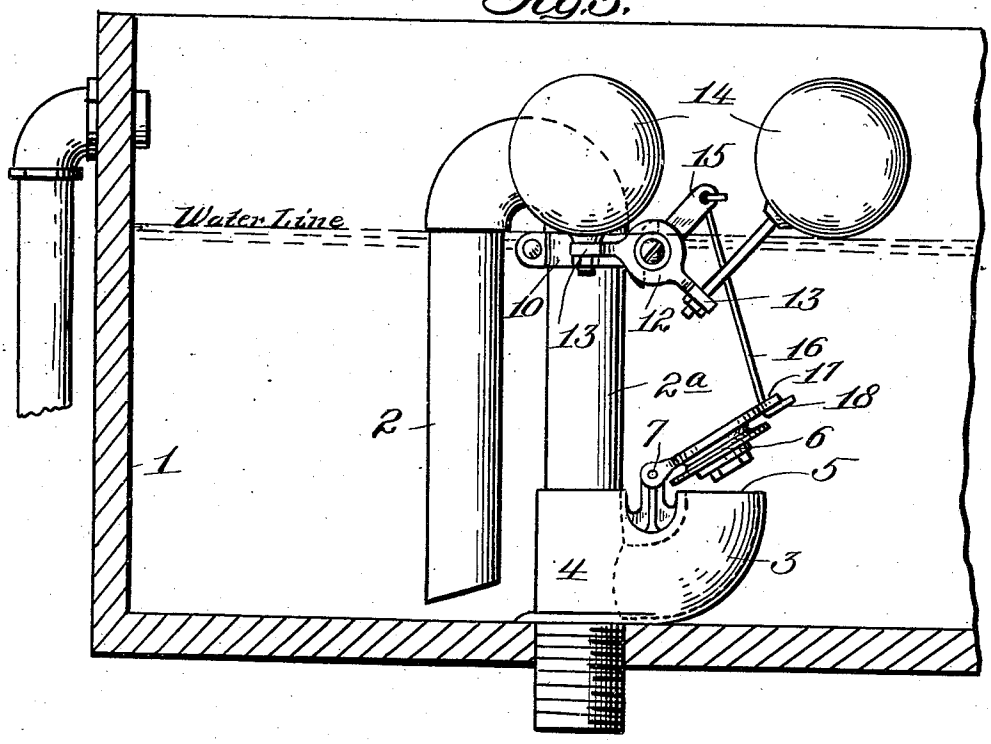


Fig. 4.

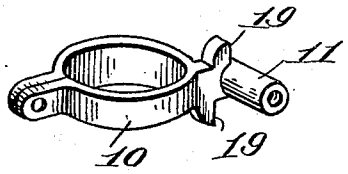
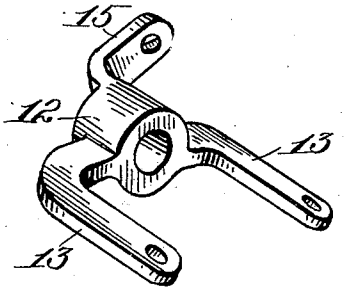


Fig. 5.



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AUTOMATIC PERIODIC FLUSHING APPARATUS.

No. 884,483. Specification of Letters Patent. Patented April 14, 1908.

Application filed March 13, 1906. Serial No. 305,927.

To all whom it may concern:

Be it known that I, JOHN W. GRANTLAND, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Automatic Periodic Flushing Apparatus, of which the following is a specification.

My invention relates to improvements in automatic periodic flushing apparatus, and has for its object to provide such an apparatus, the elements of which are combined for a novel mode of operation to insure an effective flushing discharge.

With this object in view, the invention consists in a flushing device having the features hereinafter described and illustrated in the accompanying drawing.

That which is regarded as new will be set forth in the clauses of claim appended to the specification.

In the accompanying drawing illustrating that which I regard as the best known embodiment of my invention,—Figure 1 is an elevation showing the parts in the position of rest; Fig. 2 is a similar view in which the parts are shown at an intermediate stage of operation, ready to fully open the valve; Fig. 3 is a similar view showing the position of the parts when the valve has been fully opened; Fig. 4 is a perspective view of the float supporting collar or bracket; and Fig. 5 is a similar view of the swivel float carrier.

Referring to the said drawings, the reference numeral 1 designates a tank of any suitable description located in any desired situation and which may be supplied with water or other liquid automatically or manually in any desired manner. Since this invention is not concerned with the means whereby the water is supplied to the tank, such means are not illustrated. It may be stated, however, that in the contemplated operation of the invention, the tank will be supplied with water automatically.

Within the tank is disposed a siphon 2, the discharge leg 2^a whereof is arranged for connection to a conduit leading to the receptacle to be flushed. Communicating with the discharge leg of the siphon is a siphon-starter, shown as an elbow pipe 3, communicating at 4 with the discharge leg 2^a, and having a valve-controlled mouth 5 adapted to be opened to the fluid in the tank. The valve 6, for opening and closing the mouth 5 of the siphon-starter, is preferably and as shown, a hinged valve working about a center 7.

Combined with the siphon and the valve thereof is a duplex float mechanism so associated therewith that as the water rises in the tank one element of the float mechanism, rising upwardly upon the surface of the rising body of water, will so dispose the connection of the float mechanism with the valve, as shown in Fig. 2, that the second member of the float mechanism then beneath the surface of the water will, according to known laws of physics, rise through the body of water and seek the surface thereof, and in so doing open the valve of the siphon starter to secure an effective siphonic action, as shown in Fig. 3.

To effect the described operation, a preferred arrangement is shown in the drawing and therein the reference numeral 10 designates a collar designed to be clamped about the discharge leg 2^a of the siphon, as by means of a screw acting upon the free ends thereof in an obvious manner. The collar 10 is provided with a pintle 11 (Fig. 4) on which is swiveled a float carrier 12, the form of which shown in the drawing consists of a barrel having a plurality of arms 13 projecting radially therefrom at different angles and to which are connected floats 14, one of which is arranged to operate automatically under the influence of the water in the tank in advance of the other and to dispose said other or second float so that it will rise; one of said floats sustaining a position whereby it is immediately influenced by the water in the tank, and the other float being "dead" until the first mentioned one has disturbed its position and caused it to assume a position whereby it will become active. Combined with said floats, in the example shown, by means of a crank arm 15 with which the float carrier is provided, is a valve rod or link 16, the connection whereof with the valve, through the medium of the carrier, is a lost motion connection; that is to say, such a connection that during a portion of the movement it exerts no influence upon the valve, but disposes the parts so that in the continued movement of floats the valve is quickly opened.

To accomplish the purpose stated the valve 6, is connected to the float mechanism by the said rod or loose link 16, which works throughout part of the travel of the floats loosely through an apertured projection 17 in

the valve 6, and is provided with means such as a finger 18 to engage the valve. The link 16 is connected to the crank arm 15, as stated, the assemblage of the parts being such that one float element, rising under the influence of the ascending body of fluid, will draw upon the link connection until the finger 18 comes into engagement with the valve, and thereafter the other float element, which has in the meantime, as described, assumed the position shown in Fig. 2, seeking, in accordance with known laws, the surface of the body of fluid, exerts the valve-opening function of the link and quickly fully opens the valve, admitting a full flush of fluid through the siphon-starter 3, and initiating a complete and effective siphonic action of the siphon.

In order to limit the travel of the plural member float mechanism, stops 19 are provided on the supporting collar 10, with which stops the crank arm 15 engages at the extremes of the designed travel of the float mechanism. The ultimate result of the arrangement set forth is a full flush through the siphon starter, inducing an effective and complete automatic siphonic action for flushing purposes.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a hinged valve combined with said siphon starter, a support connected with said siphon, float mechanism swiveled in said support and comprising a plurality of floats, a crank arm combined with said float mechanism, and a link connected with said crank arm, loosely connected with said valve and provided with means to engage said valve.

2. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, a support clamped to said siphon, float mechanism having a swiveled connection with the support and comprising a plurality of floats, and a connection between said float member mechanism and valve.

3. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, a support clamped to a leg of the siphon and provided with a pintle, float mechanism having a swiveled connection with said pintle and comprising a plurality of floats, and a lost motion connection between the float mechanism and valve.

4. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, float mechanism comprising a plurality of floats and a swiveled support upon which said floats are mounted, means for limiting the extent of movement of the float mechanism, and a lost motion connection between the latter and the said valve.

5. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, and a float mechanism connected with said valve and composed of a plurality of float members, and a pivotal support upon which said float members are swiveled.

6. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, float mechanism comprising a plurality of float members, one float member being normally in active position and the other normally in substantially dead center position, and a link connecting said float mechanism with said valve, passing loosely through said valve and having means to engage said valve.

7. In a flushing mechanism, the combination of a siphon, a siphon starter associated therewith, a valve combined with said starter, a float mechanism support, arms projecting radially at different angles from said support, float members carried by said arms, one of said float members being normally in active position and the other being normally in dead position, and a lost motion connection between the float mechanism and the valve.

8. In a flushing device, the combination with a tank, of a siphon discharge therefor, a siphon starter, a valve arranged to open and close the same, float mechanism for controlling the operation of the valve comprising a plurality of floats and a movable support therefor common to all the floats, one of said floats being in a normally active position and the other in a normal state of equilibrium and inactive, and a lost motion connection between said valve and float mechanism, substantially as and for the purpose described.

9. In combination, a siphon, a siphon starter, a valve therefor, and float mechanism for controlling the operation of said valve to automatically effect a periodic flushing, said float mechanism comprising a plurality of floats movable about a common center and one of which is in a normally active position and the other in a normally inactive position, and a lost motion connection between said valve and float mechanism.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN W. GRANTLAND.

Witnesses:
WM. R. HELLERMAN,
J. RALSTON GARRISON.