

W. GUYTON & R. STINSON.
FLUSHING APPARATUS.
APPLICATION FILED JUNE 15, 1911.

1,065,899.

Patented June 24, 1913.

Fig. 1.

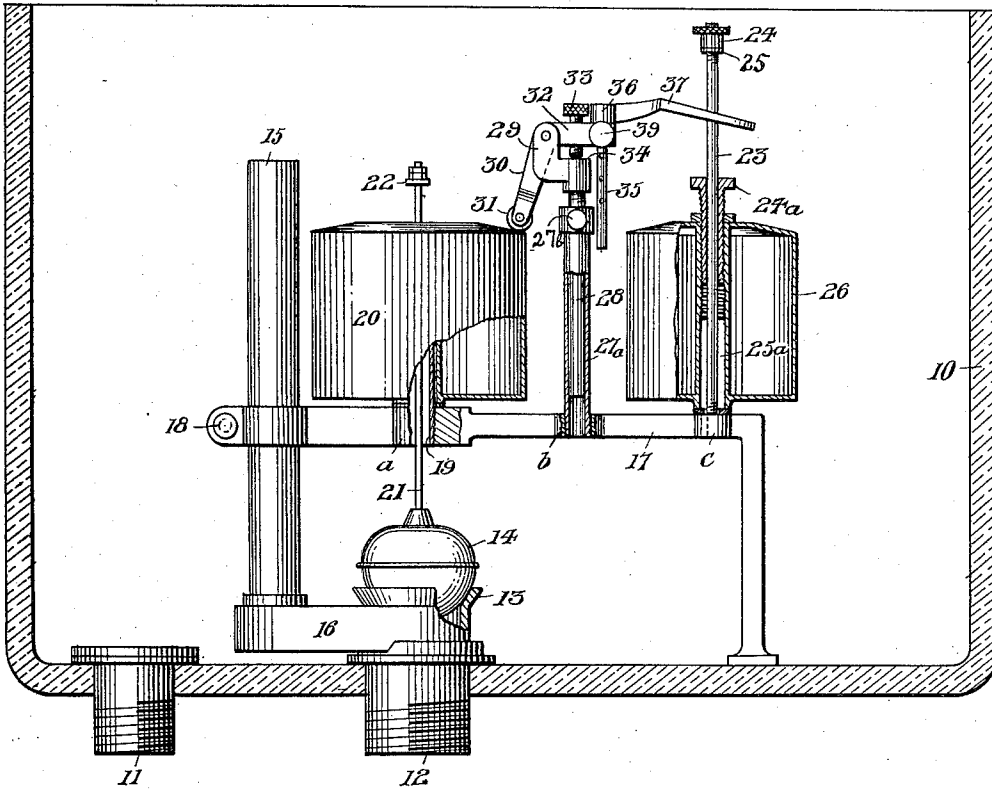
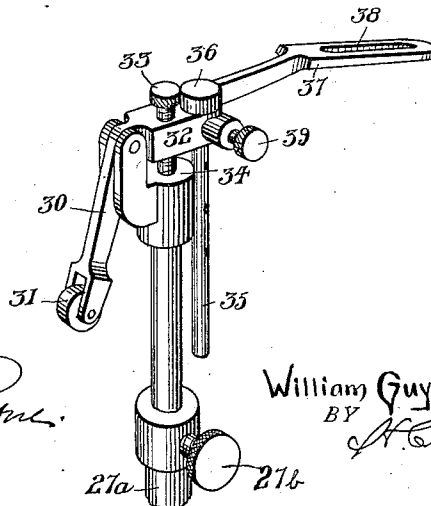


Fig. 2.



WITNESSES:

Samuel Payne.
H. S. Seitz

INVENTORS
William Guyton & Robt. Stinson,
BY *H. C. Everett*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM GUYTON, OF AVALON, AND ROBERT STINSON, OF PITTSBURGH,
PENNSYLVANIA.

FLUSHING APPARATUS.

1,065,899.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed June 15, 1911. Serial No. 633,236.

To all whom it may concern:

Be it known that we, (1) WILLIAM GUYTON and (2) ROBERT STINSON, citizens of the United States of America, residing at (1) Avalon and (2) Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Flushing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

Our invention relates to improvements in flushing apparatus, and particularly to that type adapted to provide an automatic intermittent flushing operation.

The present invention is an improvement upon the apparatus disclosed in the United States Letters Patent granted to William Guyton, No. 976,870, patented November 29th, 1910, being of the same general type and providing structural differences therefrom.

The principal object of the present invention is to provide adjustments to control the periodical opening of the flushing valve as to time and of the amount of water adapted to be passed through the flushing pipe.

Other objects are to provide for improved operating efficiency, durability, simplicity and decrease in the cost of manufacture.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views, Figure 1 is a sectional view taken through a flushing tank, showing our improved apparatus in position therein, the apparatus being shown mainly in elevation with parts broken away for the purpose of showing detailed construction. Fig. 2 is a perspective detail view of the controlling device.

10 designates the flushing tank, and is adapted to receive the inflowing water from any suitable source, the manner in which the water is introduced to the tank forming no part of the present invention; as

illustrating one way in which this supply may be provided, we show a coupling piece 11 to which a water supply may be connected, said coupling piece being open to the interior of the tank.

12 designates the outlet, having the valve seat 13 with which a suitable flexible valve 14 is adapted to cooperate to control the flow of water into the outlet 12.

15 designates the overflow pipe mounted in a suitable casting 16 which provides open communication between the pipe 15 and the outlet 12 below the valve 14.

17 designates a supporting member, preferably L-shaped, one end of which is formed to embrace the pipe 15, said member preferably having the latter end split to permit a ready passage of the embracing portion over the pipe 15, said part being adapted to be clamped into position by suitable means, such as a set screw 18. The opposite end of said member is preferably supported on the bottom of the tank, and may, if desired, be secured thereto by any suitable means. The horizontal portion of the member 17 is preferably provided with suitable enlargements *a*, *b*, *c*, adapted to receive the parts presently described, each of said enlargements being preferably formed with openings, the latter being preferably screw-threaded.

Mounted in the enlargement —*a*— is preferably a tubular member 19 projecting upwardly from the member 17, said member 19 being adapted to form a loose support for the secondary float 20, the latter being provided with a suitable opening into which the member 19 extends. Said member 19 is preferably tubular in form to permit the passage therethrough of the valve stem 21 for the valve 14, said stem extending upwardly through the float 20 and having at a point spaced from the top of said float, when the latter is at a lower position, a suitable stop 22 which may be in the form of lock-nuts with a washer, it being understood that any preferred type of stop may be employed. The secondary float 20 is provided for the purpose of raising the valve 14 from its seat, and is preferably provided with a slightly beveled upper face for a purpose presently described.

Mounted in the enlargement —*c*— is a rod 23 which projects upwardly from said en-

largement and has its upper end threaded and provided with an adjusting nut 24 and washer 25, these parts being an example of a preferred type of stop. Loosely mounted
 5 on the rod 23 is a bushing 24^a which is adapted to be threaded into a central opening 25^a formed in the primary float 26, the latter being adapted to normally rest on a washer 27, or other suitable buffer mounted on the
 10 rod 23 above the member 17. The bushing 24^a is screwthreaded to provide for an adjustable positioning thereof in the float 26 for a purpose presently described, and may be held in adjusted position in any suitable
 15 manner, as by a lock-nut 27.

Mounted in the enlargement —b— is a tubular member 27^a of suitable length which is adapted to receive a rod 28 which forms a support for the controlling mechanism
 20 now to be described, said rod being adjustable longitudinally of the member 27^a and adapted to be held in its adjusted position by means of a set screw 27^b. Said rod 28 has its upper end provided with a bracket 29
 25 within which an elbow lever 30 is pivoted, said lever having one end formed to carry a roller 31 which is adapted to normally rest in the path of movement of the secondary float 20, as shown in Fig. 1, said roller being
 30 provided for the purpose of retaining said float in its lower position regardless of the height of the water in the tank. The opposite end of said lever 30 is enlarged to provide a head 32 in which is mounted a threaded
 35 member 33, the lower end of which is adapted to seat on an upper face 34 of the bracket 29, this member 33 providing for an adjustment of the throw of the lever in one direction, and also serving to control the
 40 amount of overlapping of the roller 31 on the float 20. The head 32 is also provided with an opening through which is passed a rod 35, the upper end of which is enlarged as at 36 and has a projecting lever 37, the
 45 outer end of which is provided with a slot 38 through which the rod 23 extends. The rod 35 is adapted to be moved through its opening in the head 32, being adjustable relatively to the head, a set screw 39 being
 50 preferably provided for the purpose of retaining the rod in its adjusted position.

The member 19 and rods 23 and 28 are preferably threaded into the enlargements.

When in use, and after all adjustments
 55 have been made, the operation is substantially similar to that set forth in the patent referred to, viz: With the parts in the position shown in Fig. 1, and with the valve 14 on its seat, the float 20 is held from vertical
 60 movement as the height of the water in the tank gradually rises, by the roller 31. As the water rises, the float 26 will be carried upwardly therewith, until the upper end of the bushing 24 contacts with the under face
 65 of the lever 37, whereupon said lever will be

carried upwardly by the bushing, with the result that the elbow lever 30 is rocked on its pivot in a direction to gradually move the roller 31 out of the path of movement of the float 20. As soon as the latter occurs,
 70 the float 20 will rapidly rise, and since said float 20 has been retained a considerable distance below the water level by reason of the function of the roller 31, said float will move
 75 upwardly a distance sufficient to raise the valve from its seat, the movements of the float and valve 14 being rapid as will be obvious. This raising of the valve 14 permits the water to flow through the outlet 12 and gradually reduce the water level of the tank
 80 in the usual manner, the valve 14 remaining unseated while the tank is discharging. As the water level recedes, the floats 20 and 26 will pass downwardly until they seat on the supporting member 17, the roller 31 riding
 85 against the side face of the float 20 until the latter has passed downwardly a distance to permit the roller to assume its normal position on top of the float 20.

As will be readily understood, the float
 90 26 will only act in connection with the lever 37 as long as the water in the tank has its level at a height sufficient to cause the bushing 24 to contact with the under face of said lever. Since said lever and bushing have
 95 no positive connection, it will be understood that the float 26 passes downwardly as the water level recedes, leaving only the excess of weight of the lever end of the elbow lever to provide the necessary force to carry the
 100 roller to its proper position when the float 20 has about reached its lower position, this construction reducing the weight of such lever structure so that the roller 31 will contact lightly with the side of the float 20
 105 when the float 26 has passed out of contact with lever 37. During the time of water discharge, the valve 14 will remain unseated as is usual in such cases, said valve having its stem free to move within the float 20.
 110 As the water level reaches its lower position, the valve 14 will gradually seat until the outflow is entirely cut off, whereupon the tank-filling operation will again take place and the cycle described be repeated.
 115

We have provided for a number of adjustments in the apparatus for various purposes, and these will now be indicated.

In order that the quantity of water to be discharged may be controllably regulated,
 120 we provide for two (2) adjustments, one by means of the bushing 24^a the adjustment of which controls the time of contact for the lever movement, it being obvious that a movement of the bushing into the float will
 125 necessitate a greater length of movement of the latter on the rod 23 before the roller is moved out of the path of movement of the float 20, thus providing for a higher water level and increasing the amount of water to
 130

be discharged; a movement of the bushing outward from the float will shorten the length of movement of the float 26, thus tripping the mechanism when the water level is at a lower height. As it may be desired to increase the length of movement of the float 26 beyond what may be conveniently provided by an adjustment of the bushing 24^a, the set screw 39 is unloosened and the rod 35 raised and placed in a new position, after which the screw 39 is tightened, resulting in positioning the lever 37 at a higher point in the path of movement of float 26, without affecting the normal position of the elbow lever 30. These adjustments provide both for controlling the amount of water to be passed through the outlet at each operation as well as the time interval between successive flushings, since a raising of the water level will require a longer period of time to fill the tank to reach its operative level.

For the purpose of controlling the sensitiveness of the device, and for taking up wear, etc., we provide the set screw 33, the movements of which cause the roller 31 to have its normal position varied between a position whereby a slight movement of the lever will cause it to free the float 20, and a position where a considerable movement will be required to carry it to its float-releasing position.

It will thus be seen that we have provided for all of the exigencies of use and for an accurate controlling of the entire operation by the use of but few parts, none of which are likely to become disarranged or readily broken, as by water pressures and the movements of the water in the tank, it being readily understood that the only parts which have material movement under the action of the water are the floats 20 and 26, and each is free to move without placing a strain on the operating parts, excepting such as is provided by the flotation pressure of the valve 20 which is exerted directly on the pivot for the lever 30 and on the set screw 33.

We preferably mount the roller 31 loosely in the elbow lever 30, and this results in a gradual shifting of the float 20 around its axis so that the wear is evenly distributed on the surface of the float.

By reason of the particular mounting of the rod 28, it will be readily understood that not only is there a positive advantage provided by reason of the longitudinal adjustment, which readily takes care of changes in the size of the secondary float when substitutions therein are desired, but in addition this particular construction permits of the removal of the controlling device as an entirety, it being necessary only to remove the stop 24 and release the set screw 27^b to permit the entire device to be raised bodily out of the tank, thereby giving free access

to the parts therein for the purpose of making changes or repairs as may be found necessary.

While we have herein shown a preferred form for carrying our invention into effect, it will be readily understood that variations and modifications therein may be required under the exigencies of use, and we desire it to be understood that we reserve the right to make any and all such variations therein as may be found necessary and which may fall within the spirit and scope of the invention as expressed in the claims.

Having thus described our invention, what we claim as new is;

1. In flushing apparatus and in combination, a valve-operating float, means for normally restraining the flotation movements of said float, and a separate float adapted to release such restraining means when the water level has reached its predetermined height, a non-movable support extending axially of said float, and a bushing carried by and adjustable axially of said releasing float to vary the water level height at which said releasing operation takes place, said bushing and support cooperating to guide the releasing float during its movements.

2. In flushing apparatus and in combination, a valve-operating float, means for normally restraining the flotation movements of said float, a separate float adapted to release such restraining means, and a stationary guide for and on which said latter float travels, said restraining means including an element located in the path of movement of both floats, said element being free to move relatively to said guide formed of parts adjustably connected to move in unison, the adjustment varying the length of movement of the releasing float without affecting the normal position of either float.

3. In flushing apparatus and in combination, a valve-operating float, means for normally restraining the flotation movements of said float, a separate float adapted to release such restraining means, and a stationary guide for and on which said latter float travels, said restraining means including an element located in the path of movement of both floats, and projecting over the valve float when the latter is restrained, said element being free to move relatively to said guide and including means for adjusting the element to vary the amount of such projection, whereby the length of releasing movement may be varied.

4. A controlling device for timing the operation of flushing apparatus, comprising a support, a rocking lever having a roller adapted to normally retain the valve-opening float against operation, said lever having an adjustable stop to control the movement of the lever in one direction, the adjustments of said stop controlling the sensi-

tiveness of the tripping of said release of the float, a member carried by said lever and adapted to be moved by the rise of the water in the flushing apparatus in a direction to rock the lever in the opposite direction, said member being adjustable to vary the time of movement of the lever, and a float for moving said member in one direction.

5. A controlling device for timing the operation of flushing apparatus, comprising a support, a pivoted lever having a roller adapted to normally retain the valve-opening float against operation, a member carried by said lever and adjustable thereon, and a float independent of said member for moving it in one direction, said movement rocking the lever to release the valve-opening float, the adjustment of said member controlling the time of rocking of the lever, the movements of said member in the opposite direction being independent of the fall of the water level.

6. In flushing apparatus, the combination with a valve float for controlling the opening of the water discharge, and an independent float, of a device adapted to normally retain the valve float against valve-opening movement, said device being sup-

ported intermediate said floats and extending into the path of movement of the independent float, and means for adjusting said device vertically on its support to control the point at which the valve float is retained, said device being also adjustable to provide variations in the length of movement of the independent float prior to the release of said device from its valve float retaining position.

7. In flushing apparatus and in combination, a valve-operating float, means for normally restraining the flotation movements of said float, a separate float adapted to release such restraining means, a stationary guide for and on which said latter float travels, said restraining means including an element located in the path of movement of both floats, said element being free to move relatively to said guide, and a support for said restraining means positioned intermediate said floats.

In testimony whereof we affix our signatures in the presence of two witnesses.

WILLIAM GUYTON.
ROBERT STINSON.

Witnesses:

H. G. SEITZ,
MAX H. SROLOVITZ.