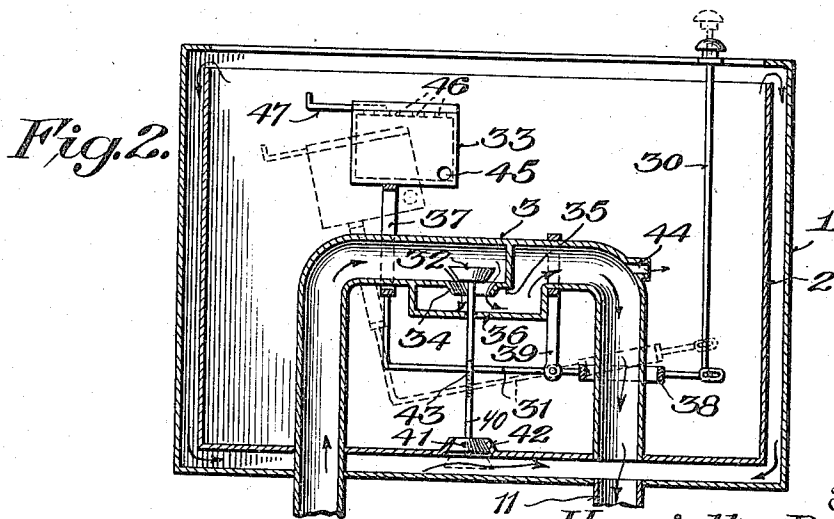
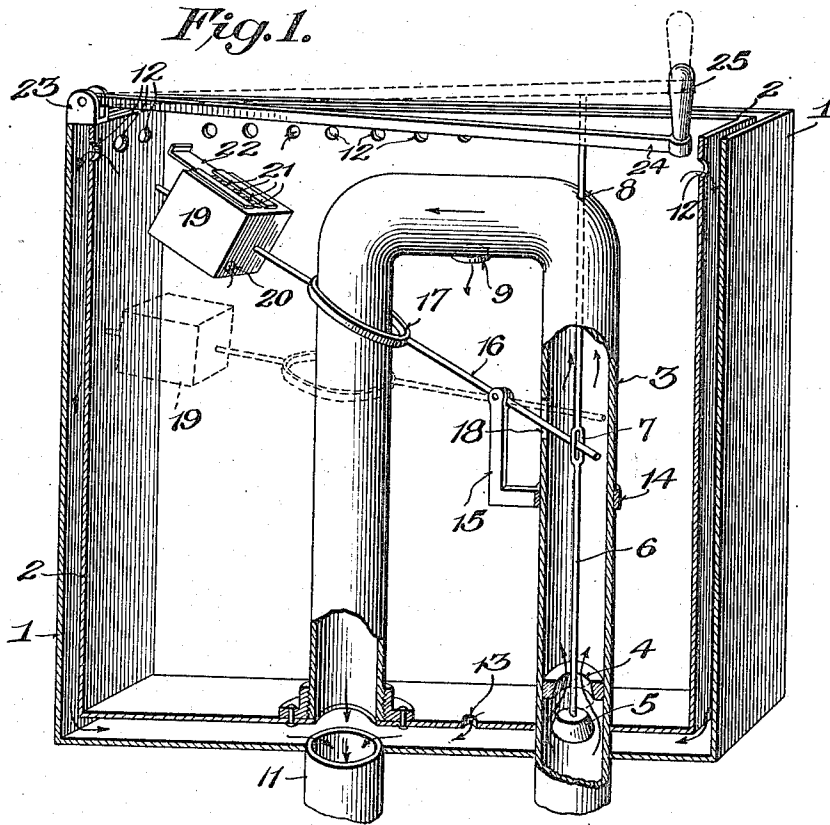


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 CONTROLLING MECHANISM FOR FLUSHING SYSTEMS.
 APPLICATION FILED MAY 16, 1918.

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CONTROLLING MECHANISM FOR FLUSHING SYSTEMS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRIETTE BOURSIER, citizen of the Republic of France, residing in the city of New York, county and State of New York, have invented certain new and useful Improvements in Controlling Mechanism for Flushing Systems, of which the following is a specification.

This invention relates to flushing systems; and it proposes, briefly, an apparatus of the general class or character specified having an improved controlling system for the water supply by means of which a flushing action is obtained immediately upon the operation of the controlling lever or its equivalent, the parts associated with said lever being arranged within a tank which, instead of normally containing water, is normally empty, but is filled almost as soon as the lever is actuated, the water in the tank controlling the position of a float which, in turn, serves to close the water inlet or supply valve previously opened consequent upon the operation of the lever.

The invention resides more particularly in the construction and arrangement of the parts or devices above indicated; but it is to be understood, of course, that no limitation to the precise structural details of said parts, as disclosed in the accompanying drawing, is contemplated, excepting as imposed by the terms of the claims appended hereto, since modifications and changes may well be made within the scope of said claims, and various parts may be used without others and in other and different environments.

In said drawing:

Figure 1 is a sectional perspective view of one form which the invention may take in practice, and Fig. 2 is a sectional elevation of a modification.

The tank element of the system is double-walled, and, as shown in the drawing, comprises outer and inner members 1 and 2 spaced from each other at all points to provide an intermediate chamber of the same shape as the tank members themselves, the latter, in the present instance, being open-topped. This chamber is utilized for overflow purposes to convey the water to the flushing pipe 11 that leads to the bowl (not shown) and opens through the bottom wall of the outer member 1, the excess water passing into said chamber through a series of openings 12 formed in the upper portions of the walls of the inner member 2, according to the construction represented in Fig. 1, and

over the upper edges of said walls in the form depicted in Fig. 2.

Water is delivered to the pipe 11 for flushing purposes, and, incidentally, to the tank, by means of an inverted U-shaped pipe 3, one branch of which leads upwardly through the bottoms of the tank members 1 and 2, while the other or downwardly-extending branch opens at its free end through the bottom of the inner member 2 at a point directly above the open upper end of the flushing pipe, this being true of both forms of the invention. The first-mentioned or ascending branch of the supply pipe is provided with an internal valve seat 4, in the form shown in Fig. 1, with which a valve 5 coöperates, the latter being secured to the lower end of a vertical rod 6 which extends axially through said branch and projects through an opening 8 in the top thereof. The valve is normally held in closed position against its seat 4 by the pressure of the water against its under face, and is opened by depressing a lever 24 to which the upper end of rod 6 is fastened, one end of the lever being pivoted in a bracket 23 mounted on the top of the tank, while its other end is equipped with a handle 25. The horizontal or connecting portion of the U-shaped supply pipe is formed in its under side with a relatively large opening 9, and the bottom of the inner tank member 2 is provided with an opening 13 of about half the size of the pipe opening, the opening 13 serving as an outlet for the water in the tank and the opening 9 as an inlet or filling opening therefor. Hence, when the lever 24 is operated it will immediately lower the valve 5 from its seat and permit water to rush through the supply pipe and into the flushing pipe 11, the apparatus as a whole being primarily designed for use in connection with high-pressure water service, such as is generally found in large cities at the present time. A portion of the water flowing through the latter pipe will, however, pass out through the opening 9 into the tank, and, by reason of the difference in size of the openings 9 and 13, will commence to fill the tank. The pipe 3 has a relatively-large diameter, as compared with the tank, which latter, as will be seen from the drawing, is comparatively small, and the opening 9 is likewise relatively large, as has already been stated.

When the tank is filled the water will hold the float 19 in the position shown in full lines in Fig. 1, the float being suitably con-

nected to the rod 6 so as to hold the valve 5
 open, thus permitting the release of the pressure
 on the handle 25. The float is in the form
 of a rectangular box or body and its
 5 function is to automatically close the valve
 5 when the filling operation has continued
 for a certain period and while the tank is
 still full, thereby shutting off further supply
 of the water. The tank thereupon empties
 10 through the opening 13, the water passing
 through the bottom portion of the intermediate
 chamber above referred to and thence into
 the flushing pipe. The float is carried by a
 15 rod 16 pivoted to the upstanding arm 15
 of an annular bracket 14 suitably fastened
 to the ascending branch of the supply pipe 3.
 The portion of the float rod or lever between
 the float and the bracket arm 15 includes a
 20 ring member 17, which encircles the descending
 branch of the supply pipe and is of sufficient
 diameter to permit the movements of the float,
 while the free end of the said rod extends
 through a vertical slot 18 in the ascending
 25 branch and is loosely engaged in an elongated
 eye 7 with which the valve rod 6 is centrally
 provided, so that the depression of the valve
 rod will raise the float from its normal
 30 position, shown in dotted lines, to its elevated
 or full line position. The float is designed
 to be filled with water, after having been
 raised into the latter position, and, when
 filled will sink back to its lower or normal
 35 position, during which movement it will raise
 the valve rod and automatically close the valve.
 To permit the entrance of the water into the
 float, an opening 20 is formed in said float
 adjacent its bottom, the air being forced out
 40 by the in-coming water through a plurality
 of openings 21 in the top of the float which
 may be covered or uncovered at will by a
 slide 22 in order to regulate the speed at
 which the float fills, thus regulating the time
 45 during which the valve 5 is held open by the
 float.

The operation, briefly described, is as follows:
 —Depression of the lever 24 lowers the valve
 rod 6, thus raising the float 19 and opening
 50 the valve 5, with the result that water flows
 through the supply pipe 3 and into the flushing
 pipe 11, a portion of the water entering the
 tank by way of the opening 9. When the tank
 is filled to the point where the water enters
 55 the float, which takes place almost immediately,
 due to the small size of the tank, as compared
 with the diameter of the supply pipe and its
 opening 9, and to the pressure of the water,
 the said float gradually descends, raising up
 60 the valve rod and closing the valve. The tank
 empties into the flushing pipe through the
 opening 13, the float itself emptying through
 the opening 20.

The modification represented in Fig. 2
 65 differs from the first form only in certain

details. Thus, the operating device is constituted
 by a straight, vertical rod 30, the lower end
 of which is loosely connected to a lever 31
 that serves both to open the inlet valve 32
 and to raise the float 33. The parts 70 32
 and 33 are substantially identical with the
 corresponding parts 5 and 19, excepting that
 the valve cooperates with a seat 34 which is
 formed in a partition 35 provided in an
 75 enlargement 36 of the central or horizontal
 portion of the supply pipe 3, and that the float
 is supported upon a ring 37 that encircles
 the aforesaid pipe portion. The lever 31,
 in addition to the ring 37, includes a second
 80 ring 38, which encircles the descending
 branch of the supply pipe,—in this case, the
 right-hand branch—and is pivoted upon the
 lower end of a bracket 39 suspended from
 the connecting portion of the pipe, the valve
 32 being attached to the upper 85 end of a
 vertical rod or stem 40, the lower end of
 which has fixed to it a second valve 41 that
 cooperates with a seat 42 formed in the
 bottom of the inner tank member 2. This
 valve 41 takes the place of the opening 13
 90 in the first form of the invention, and is
 normally held in open position due to the fact
 that the upper valve 32 is normally kept
 closed, both by the pressure of the water in
 the inlet or ascending side of the supply
 95 pipe and by the weight of the float, which
 is also the case in the first form, the central
 portion of the valve rod having an eye 43,
 or equivalent thereof, with which the adjacent
 portion of the lever is engaged. 100
 The supply opening 44 for the tank is located
 at the intersection of the descending and
 connecting portions of the supply pipe, instead
 of in the latter portion. The water and air
 105 openings in the float are indicated at 45
 and 46, and the controlling device for the
 said air openings at 47.

The operation, as will be understood, is the
 same as in the first form, excepting that the
 110 depression of the rod 30 serves to close the
 tank-emptying valve 41 at the same time that
 the supply or inlet valve 32 is opened and the
 float raised. The parts remain in this position
 until the float fills and commences to descend,
 whereupon the inlet valve 115 closes and the
 drain valve opens.

I claim as my invention:—

1. The combination, with a relatively small,
 normally-empty tank, a relatively large
 120 inverted U-shaped water supply pipe, and a
 flushing pipe disposed in proximity to the
 discharge branch of the supply pipe to receive
 water directly therefrom; of controlling
 mechanism for the water supply comprising,
 125 a normally-closed inlet valve in said supply
 pipe, an operating device therefor, means in
 said supply pipe for filling said tank when
 said valve is open, and a float connected
 with said valve, said float being maintained
 130 in raised position by the

incoming water, and thereafter sinking and automatically closing said valve while the tank is still full, to shut off further passage of water through the supply pipe.

5 2. The combination, with a relatively-small, normally-empty tank, a relatively large inverted U-shaped water supply pipe, and a flushing pipe disposed in proximity to the discharge branch of the supply pipe to receive water directly therefrom; of controlling mechanism for the water supply comprising a normally-closed inlet valve in said supply pipe, a valve rod connected thereto, an operating device for said valve rod. means in said supply pipe for filling said tank when said valve is open, and a float connected to said valve rod, said float being maintained in raised position by the incoming water, and thereafter sinking and automatically closing said valve while the tank is still full, to shut off further passage of water through the supply pipe.

3. The combination, with a normally-empty tank, water supply means, and a flushing pipe with which the supply means communicates; of controlling mechanism for the water supply comprising a normally-closed inlet valve in the supply means; an operating device for opening said valve to fill the tank, a float connected with said valve and having a port for the entrance and exit of water to and from it, said float being held in raised position by the water in the tank when the latter is filled to permit the pressure on said operating device to be relieved while maintaining the valve open, and adapted to sink and automatically close said valve when the water has filled the float and while the tank is still full, and a device for controlling the expulsion of air from said float to regulate its speed of filling.

4. The combination, with a normally-empty tank, water supply means, and a flushing pipe with which the supply means communicates; of controlling mechanism for the water supply comprising a normally-closed inlet valve in the supply means, an operating device for opening said valve to fill the tank, a float connected with said valve and having a port for the entrance and exit of water and a series of air outlet ports, said float being held in raised position by the water in the tank when the latter is filled, to permit the pressure on said operating device to be relieved while maintaining the valve open, and adapted to sink and automatically close said valve when the water has filled said float and while the tank is still full, and a device for variably closing said air outlet ports to control the expulsion of air from said float and thereby regulate its speed of filling.

5. The combination, with a relatively-small, normally-empty tank, a relatively large, inverted U-shaped water supply pipe, and a flushing pipe disposed in proximity to the discharge branch of the supply pipe to receive water directly therefrom; of controlling mechanism for the water supply comprising a normally-closed inlet valve in said supply pipe, a float connected with said valve, means for opening said valve, and means for filling said tank when said valve is open, said float being held in raised position by the water in the tank when the latter is filled, and acting to automatically close said valve after having been maintained in such position for a predetermined period and while the tank is still full, to prevent further passage of water through the supply pipe.

6. The combination, with a relatively-small, normally-empty tank, a relatively large inverted U-shaped water supply pipe, and a flushing pipe disposed in proximity to the discharge branch of the supply pipe to receive water directly therefrom; of controlling mechanism for the water supply comprising a normally-closed inlet valve in said supply pipe, a normally-lowered float connected with said valve operating means connected to simultaneously open said valve and raise said float, and means for filling said tank when said valve is open, said float being maintained in raised position by the water in the tank when the latter is filled, and acting to automatically close said valve after having been held in such position for a predetermined period and while the tank is still full, to prevent the further passage of water through the supply pipe.

7. The combination, with a relatively-small, normally-empty tank, a relatively-large inverted U-shaped water supply pipe, and a flushing pipe disposed in proximity to the discharge branch of the supply pipe to receive water directly therefrom; of controlling mechanism for the water supply comprising a normally-closed inlet valve in said supply pipe, a depressible operating element, a member connected to be operated by said element and to open said valve means in said supply pipe for filling said tank when said valve is open, and a float connected to said member, said float being held in raised position by the water in the tank when the latter is filled, and acting to automatically close said valve after having been maintained in such position for a predetermined period and while the tank is still full, to prevent the further passage of water through the supply pipe.

In testimony whereof I affix my signature.

HENRIETTE BOURSIER.