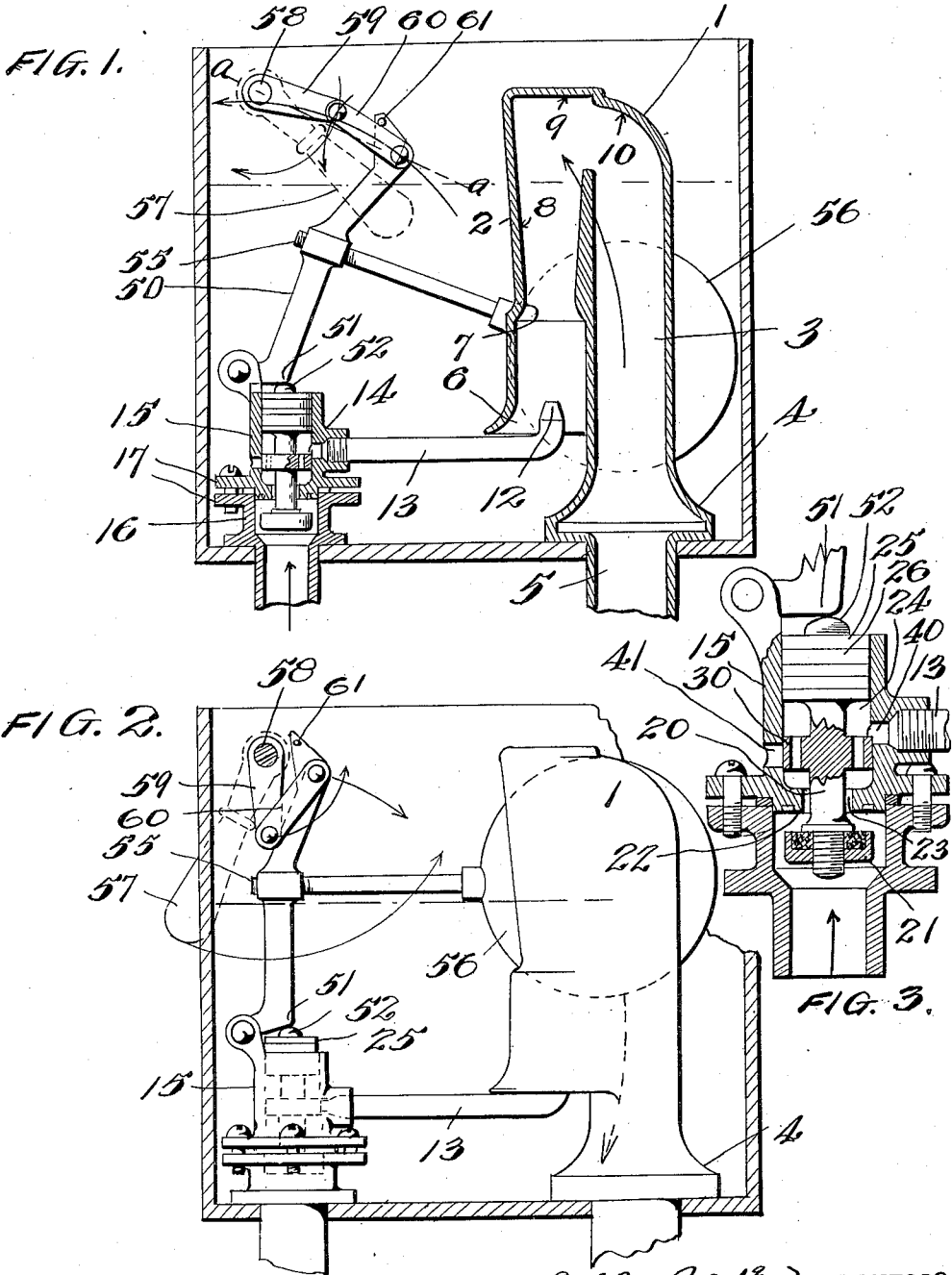


N. G. GOREAU & E. M. BABST.
FLUSHING MECHANISM.
APPLICATION FILED DEC. 28, 1912.

1,091,834.

Patented Mar. 31, 1914.

2 SHEETS-SHEET 1.



WITNESSES

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W. B. Brock.

Emile M. Babst & } INVENTORS
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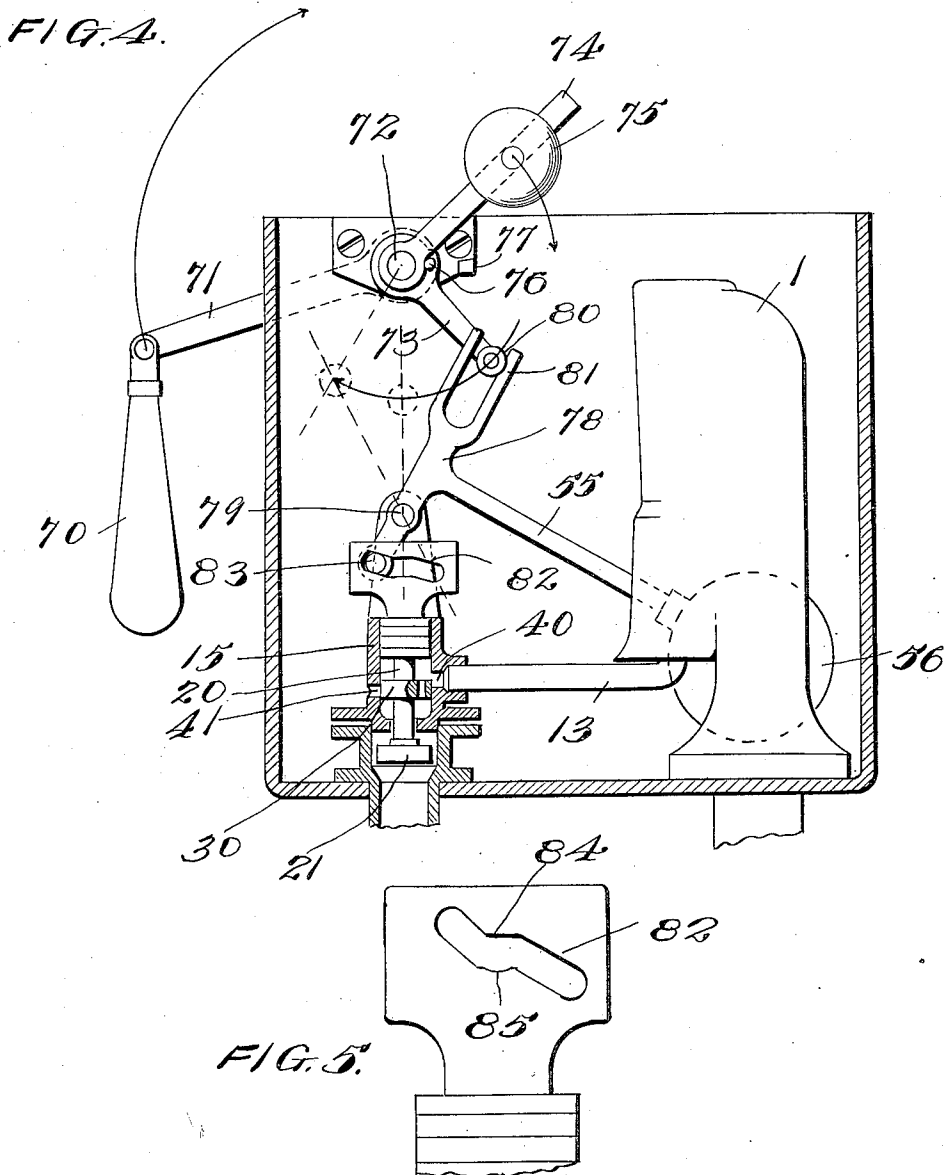
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UNITED STATES PATENT OFFICE.

NELSON G. GOREAU AND EMILE M. BABST, OF NEW ORLEANS, LOUISIANA; SAID
GOREAU ASSIGNOR TO SAID BABST.

FLUSHING MECHANISM.

1,091,834.

Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed December 28, 1912. Serial No. 739,081.

To all whom it may concern:

Be it known that we, NELSON G. GOREAU and EMILE M. BABST, citizens of the United States, and residents of New Orleans, Louisiana, have invented certain new and useful Improvements in Flushing Mechanism, of which the following is a specification.

Our invention relates to flushing mechanism which may be used for closets and other purposes.

A principal object is to do away with any valve which directly controls the discharge of water for flushing. By eliminating this valve the objectionable leaking and faulty closing and other difficulties common in flushing valves are eliminated.

A further object is to provide very simple and efficient mechanism for producing a vigorous flushing action, especially in connection with low-down tanks.

Another object is to combine in a single valve means for controlling the flushing and refilling operations. A jet is employed in connection with a siphon for starting the flushing action and the invention comprises means for continuing the jet for a suitable time during flushing to insure the continuance of the operation.

Another object is to positively lock the valve in flushing position by the action of the float, so long as the water in the tank is above a certain level.

The objects and advantages of the invention will be described, so far as necessary, in connection with the detailed description of the accompanying drawing, which shows an exemplifying structure embodying the invention.

In the drawing—Figure 1 is a vertical section through a tank and associated mechanism embodying the invention; Fig. 2 shows the mechanism in idle position, the tank being shown in section and the other parts in elevation; and Fig. 3 is a longitudinal section of the valve enlarged. Fig. 4 is a vertical section of a modified form of the invention. Fig. 5 is an enlarged detail of the upper end of the valve stem as used in Fig. 4.

Referring first to Figs. 1 to 3 inclusive: Reference character 1 designates the siphon as a whole, 2 is the short leg and 3 the long leg. The long leg has a bell-shaped enlargement 4 resting on the tank bottom, and pipe 5 proceeds to the bowl or sink to be

flushed. The shape of the siphon may vary greatly but its particular form may be of considerable importance. In the preferred construction the short leg has a bell-shaped mouth 6, a restricted throat 7 and a gradually flaring bore 8 leading from the throat to the top of the siphon where a flat abutment 9 is formed. The long leg connects with the short leg immediately below the abutment by curved portion 10. Slightly within the mouth of the short leg is the jet or nozzle 12 carried at the end of pipe 13 leading from the combined flushing and refilling valve, the body of which is designated by character 14. The body may be formed in two parts 15 and 16 secured together by flanges 17 and suitable screws or bolts. This is for convenience in manufacturing, the easy formation of the main valve seat, and other reasons which will be obvious. Within the body is valve stem 20 carrying at its lower end the suitably packed main valve 21. In the body portion 15 at the bottom thereof is formed the main valve seat 22, upon which the main valve closes in the direction of water flow. There is an enlarged bore 23 surrounding the valve stem and communicating with cylinder 24 formed in the upper part of the body. The upper end of this cylinder is closed by a piston 25 having suitable packing 26 carried by the upper end of the valve stem. Below the piston is a port valve 30 fitting the cylinder like a piston and provided with water passages 31 leading through it in an axial direction. The periphery of this valve serves to open and close at the proper times the jet port 40 and the refill port 41. Port 40 communicates with jet pipe 13 and refill port 41 communicates directly with the tank. At the upper end of the valve body is pivoted float lever 50. This is provided with a cam-like shoulder 51 engaging the upper end 52 of the valve stem. Conveniently about midway of the lever the float stem 55 is connected and on the end of this is float 56. The operating handle 57 is located outside the tank and fixed to a shaft 58. Within the tank an arm 59 is fixed on the shaft and this is connected by a link 60 with the upper end of lever 50. A stop 61 is preferably provided on the upper end of the lever or at some other place to limit the motion of the parts, as will appear. Operating handle 57 is usually of considerable weight to cause

it to perform a useful function in the operation of the mechanism, as will appear.

When the mechanism is idle and the tank full, the parts are in the position of Fig. 2, with the water level approximately up to the danger point of the short leg of the siphon. To flush, handle 57 is pulled up to the position shown in Fig. 1. This moves arm 59 and link 60 until they are in a straight line indicated by the dotted line *a-a*, Fig. 1, and then moves them slightly farther until checked by stop 61. The float lever 50 is at the same time moved to the right and the float is depressed below the water surface. Cam shoulder 51 on lever 50 depresses valve stem 20 to the utmost and opens the main valve 21 against the pressure in the supply pipe. At the same time port valve 30 is moved opposite the refill port 41 and jet port 40 is uncovered. Water now immediately flows through the bore 23, passages 31 in the port valve, through jet port 40 and jet pipe 13 and issues from the jet 12 in a forcible stream. Both by positive supply of additional water and by strong injector effect this stream or jet causes water to overflow into the long leg of the siphon; the siphon is completed, and continues drawing water from the tank until the level of the opening 6 of the short leg is reached. The enlarged bell 4 in the long leg of the siphon assists in commencing the siphonic action in a manner well understood. As long as there is any considerable body of water in the tank the float is urged upward vigorously by its floating capacity and thus holds arm 59 and link 60 in the offset position shown in Fig. 4. This position of the arm and link in turn lock lever 50 and valve stem 20 in the flushing position so that a continuous strong jet of water is supplied to the siphon until the water level falls nearly to the siphon inlet 6. At about this time the float drops slightly, bringing arm 59 and link 60 again into a straight line. The weight of handle 57 thereupon immediately draws the arm and link down farther toward the position shown in Fig. 2, and positively raises the float a short distance, sufficient to permit jet valve 30 to cut off the jet port and open the refill port 41. The tank then rapidly refills and float 56 rises until at the proper level, main valve 21 closes and is held by water pressure, and everything is ready for another action.

In some cases it might be desirable to positively connect lever 50 with valve stem 20 by suitable linkage, but in other cases this is unnecessary, the water flow supplying ample means for closing the valve.

Now, referring to Figs. 4 and 5, which illustrate a modified construction: The tank, siphon, jet nozzle, and the valve structure, except the upper end of the valve stem, are

substantially the same as in Figs. 1, 2 and 3. The method of operating the valve is, however, somewhat different. The pull handle 70 depends from lever arm 71 which may be carried outside the tank on a shaft 72. Within the tank on this shaft is rigidly fixed an arm 73. Loosely pivoted on a shaft is a weight arm 74 carrying adjustable weight 75. A pin 76 carried by arm 73 engages under the weight arm and a stationary stop 77 limits the downward movement of the weight arm. The float stem 55 is carried by a lever 78 fulcrumed at 79 in a bracket which may be part of the valve casing 15. At its upper end this lever is forked to receive a roller 80 on the end of arm 73. One side of the fork, near its outer end, is provided with a notch or depression 81 to engage the roller. The upper end of valve stem 20 is provided with a transverse inclined cam slot 82 and in this engages a follower 83 carried by the lower end of float lever 78. The cam slot 82 is preferably provided, near its center, with a straight portion 84, as more clearly seen in Fig. 5, and in this straight part may, in some cases, be formed a notch or depression 85 to engage follower 83.

To flush, the handle is pulled, throwing the parts into the position shown in Fig. 4. The float is depressed below the water surface; cam follower 83 has raised the valve; the jet is in operation; water passes to it through port 40; the refill port 41 is closed by the port valve 30 and main valve 21 is opened. Roller 80 on the end of arm 73 is in notch 81 of the float lever fork and the lifting effort of the float locks all the parts in position for the time being, although the weighted arm 74 is now supported by pin 76 and tends to return the operating parts toward cut-off position. Conditions remain the same during flushing until the water level drops sufficiently to permit float 56 to drop slightly. Pressure of notch 81 against roller 80 is then relieved and weight 75 urging arm 74 against pin 76 positively moves arm 73 downward at the same time moving the float lever 78 to a vertical position and raising the float. This brings cam follower 83 to the straight part 84 of cam slot 82. The valve stem is thus permitted and urged to rise until port valve 30 shuts off the jet port 40 and refill port 11 is open. Water pressure at the supply side of the valve urges the valve to close farther but this is prevented by cam follower 83 which is now in vertical line with lever fulcrum 79 and in the straight part of cam 82 and also in engagement with notch 85 when such a notch is provided. A positive stop is thus afforded, preventing the valve from rising and preventing any interruption of refilling until the tank is entirely filled. At that time float 56 rises sufficiently to move cam

follower 83 away from straight part 84 to cam slot and the valve is fully raised closing main valve 21 and entirely shutting off the supply. This positive locking of the valve in refill position avoids a defect which is sometimes apparent in the construction of Figs. 1 and 2, since in that construction there is no positive lock to hold the valve for a time in refill position.

The locking of the mechanism in flushing position, as shown in Fig. 4, is not always necessary, especially with elevated tanks. In such cases the flushing action of the siphon can usually be depended upon when it is once started. Therefore, any suitable means of depressing the float initially to start the jet will be sufficient and such locking means as the toggle members 59 and 60 or cam follower 80 and notch 81 may be omitted. When once the operating handle is pulled sufficiently to move the valve past the middle position and into the jet position, the jet will operate and start the siphon and where there is a sufficient length of the long side of the siphon the flushing will continue whether the float is locked down or not. But the construction of Fig. 4 in which the float is locked down in jet position is especially desirable in low down tanks, as will be evident from the foregoing.

We claim:

1. In a tank valve mechanism, a body having a main valve seat at one end, a tank port in one side and a jet port in one side at a point farther removed from the main seat, and a movable member in said body having a main valve to coöperate with said main valve seat, and an apertured port valve member to coöperate with said ports, and means for operating said movable member.

2. In a tank valve structure, the combination of a cylindrical body having a main valve seat at one end, a tank port in one side and a jet port in one side farther from the main seat than said tank port and a movable member within the body having a main valve to coöperate with said main valve seat, an apertured port valve member, the periphery of which fits the bore of said body and serves in the opening movement to successively close the jet port to close the tank port and then to reopen the jet port while the tank port is closed, and means for operating said movable member.

3. In a tank valve, the combination of a valve body, a main valve seat therein, a tank port in the side of said body, a jet port in the side of said body but farther away from the main seat, a valve stem, a main valve at

one end thereof to close the main valve seat, an apertured disk substantially centrally located on the stem to control said ports, and a piston at the upper end of said stem to close the upper end of said valve body.

4. In a tank valve, the combination of a valve body, a main valve seat therein, a tank port in the side of said body, a jet port in the side of said body but farther away from the main seat, a valve stem, a main valve at one end thereof to close the main valve seat, an apertured disk substantially centrally located on the stem to control said ports, a piston at the upper end of said stem to close the upper end of said valve body, means to depress the valve stem and means to hold the stem in depressed position.

5. In a tank valve, the combination of a valve body, a main valve seat therein, a tank port in the side of said body, a jet port in the side of said body but farther away from the main seat, a valve stem, a main valve at one end thereof to close the main valve seat, an apertured disk substantially centrally located on the stem to control said ports, said disk and ports being constructed and arranged so that when the stem is in full opened position said disk closes said tank port and leaves said jet port open, and in closing said disk first opens said tank port, then closes the jet port and finally the main valve closes its seat, and a piston at the upper end of said stem to close the upper end of said valve body.

6. In a tank valve, the combination of a valve body, a main valve seat therein, a tank port in the side of said body, a jet port in the side of said body but farther away from the main seat, a valve stem, a main valve at one end thereof to close the main valve seat, an apertured disk substantially centrally located on the stem to control said ports, said disk and ports being constructed and arranged so that when the stem is in full opened position said disk closes said tank port and leaves said jet port open, and in closing said disk first opens said tank port, then closes the jet port and finally the main valve closes its seat, a piston at the upper end of said stem to close the upper end of said valve body, and means for operating the valve stem, and locking means for holding the stem in depressed position a predetermined time.

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