

C. A. WULF.
FLUSHING APPARATUS.
APPLICATION FILED MAY 11, 1908.

938,195.

Patented Oct. 26, 1909.

Fig. 1.

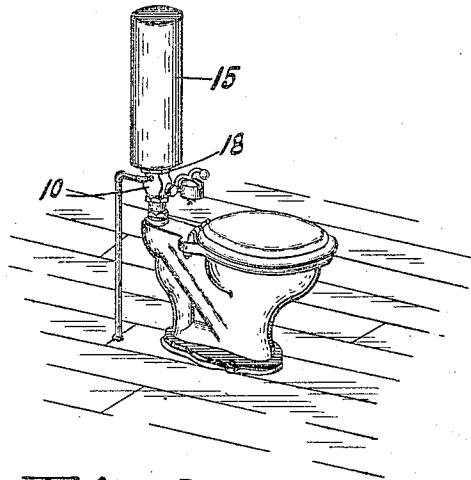


Fig. 2.

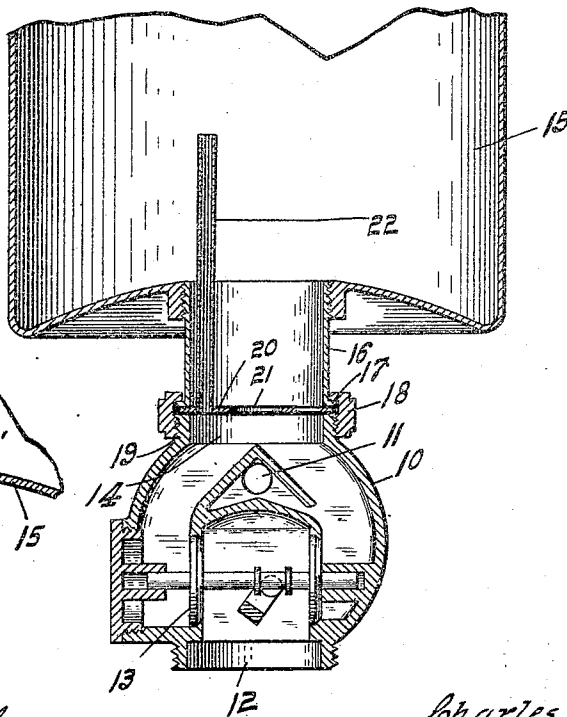
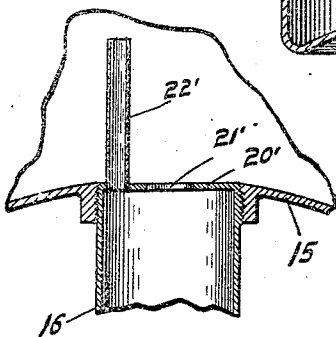


Fig. 3.



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UNITED STATES PATENT OFFICE.

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FLUSHING APPARATUS.

938,195.

Specification of Letters Patent.

Patented Oct. 26, 1909.

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To all whom it may concern:

Be it known that I, CHARLES A. WULF, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Flushing Apparatus, of which the following is a specification.

The object of my present invention is to provide means for facilitating the discharge of liquids from an air tight tank, the device being especially designed for use in connection with the flushing apparatus which forms the subject matter of my pending application Serial No. 408,132.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective view of the flushing apparatus heretofore referred to; Fig. 2 a sectional view of the tank and valve thereof equipped with my improvement, and Fig. 3 a modification.

In the drawings 10 indicates a main valve casing having an inlet 11, an outlet 12 a valve 13 between said inlet and outlet and a passage 14 forming a communication between the valve body and a reservoir or tank 15, on the inlet side of said valve body. In practice the tank 15 is provided with a hollow neck 16 having a flange 17 at its lower end and a coupling ring 18 adapted to engage the flange 17 and threaded neck 19 on the main valve body 10. With such an arrangement I find in practice that when valve 13 is opened and the liquid within the tank 15 passes down through neck 16 and body 10 out through the outlet 12 there is a tendency toward the formation of a vacuum in the upper end of tank 15 which materially retards the flow of liquid from the tank. In order to obviate this difficulty I therefore provide a ring or plate 20 adapted to be clamped between the flange 17 and the outer end of the threaded neck 19, said plate 20 having a central opening 21 and a tube 22 which extends upward therefrom into the reservoir 15, opening 21 being larger than tube 22 but considerably smaller than passage 12.

In operation valve 13 is opened and thereupon the liquid within the reservoir 15 flows downward through neck 16 and the central opening 21 of plate 20 through and out of body 10. At the same time air from the outlet 12 may pass upward through the body 10 and tube 22 into reservoir 15 and

thus prevent the formation of a vacuum within said reservoir. I find in practice that it is only necessary to carry tube 22 to a slight distance into the reservoir 15 as said tube is very considerably smaller than the opening 21 and offers more resistance to the flow of the liquid therethrough than to the upward flow of air.

In order to facilitate the passage of air upward from the outlet 12 to tube 22 I prefer to direct the flow from inlet 11 in one direction only, as shown in Fig. 2. As a consequence there is, shortly after the beginning of flow from the tank, a tendency for the water to flow toward and through the right hand side (Fig. 2) of the balanced valve 13 thus permitting air to flow up through the left hand side and gain access to the tube 22. I have found by experiment that the opening 21 should be considerably smaller than the outlet, as by that arrangement the outflow from the tank is considerably accelerated.

In practice plate 20 may be discarded and neck 16 be provided with a diaphragm 20' having an opening 21' and an air tube 22'. Tube 22 or 22' may be dispensed with and a small opening provided through the plate 20 or diaphragm 25. I find by experiment that such an arrangement accelerates to some extent the outflow of water from the tank but does not produce as good results as where tube 22 is provided and extended a short distance upward into the tank.

I claim as my invention:

1. In a flushing structure, the combination with a valve body having a reservoir passage 14, an inlet passage and an outlet passage, of a closed reservoir having a neck communicating with the passage 14, a plate 20 arranged between said neck and the valve body and having a comparatively large opening 21 therethrough, and a tube carried by said plate and extending upward into the reservoir to form a communication between the reservoir and valve body, substantially as described.

2. In a flushing structure, the combination of a closed reservoir, a controlling valve structure therefor, a communicating passage between the reservoir and valve structure with an intermediate diaphragm having two openings therethrough one of which is comparatively small.

3. In a flushing structure, the combination of a closed reservoir, a controlling valve

structure therefor, a communicating passage between the reservoir and valve structure with an intermediate diaphragm having two openings therethrough one of which is comparatively small and the other of which, while larger than the first opening, is considerably smaller than the passage.

4. In a flushing structure, the combination of a closed reservoir and a controlling valve structure therefor, a communicating passage between the reservoir and valve structure, a diaphragm arranged in said passage and having an opening therethrough considerably smaller than the passage, and also having a still smaller tubular passage extending therethrough and upwardly into the reservoir.

5. In a flushing structure, the combination with a closed reservoir, of an outlet valve structure therefor having an outlet passage and a passage communicating with the reservoir, a pair of perforated walls between said outlet and reservoir passages, a valve having a pair of heads adapted to close said perforations, a comparatively small water inlet leading into the valve structure between the reservoir passage and the valve heads and directed toward one of the valve heads, and an air tube leading from the valve structure upward into the reservoir from that portion of the valve structure remote from the valve toward which the water inlet is directed.

6. In a flushing structure, the combination with a closed reservoir, of an outlet valve structure therefor having an outlet passage and a passage communicating with the reservoir, a pair of perforated walls be-

tween said outlet and reservoir passages, a valve having a pair of heads adapted to close said perforations, a comparatively small water inlet leading into the valve structure between the reservoir passage and the valve heads and directed toward one of the valve heads, a diaphragm arranged in the passage between the valve structure and reservoir with an opening therethrough considerably smaller than the passage and a comparatively small air inlet also formed through said diaphragm and continued upwardly into the reservoir.

7. In a flushing structure, the combination with a closed reservoir, of an outlet valve structure therefor having an outlet passage and a passage communicating with the reservoir, a pair of perforated walls between said outlet and reservoir passage, a valve having a pair of heads adapted to close said perforations, a comparatively small water inlet leading into the valve structure between the reservoir passage and the valve heads and directed toward one of the valve heads, a diaphragm arranged in the passage between the valve structure and reservoir with an opening therethrough considerably smaller than the passage and a comparatively small air inlet also formed through said diaphragm.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this ninth day of May, A. D. one thousand nine hundred and eight.

CHARLES A. WULF. [L. s.]

Witnesses:

ARTHUR M. HOOD,
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