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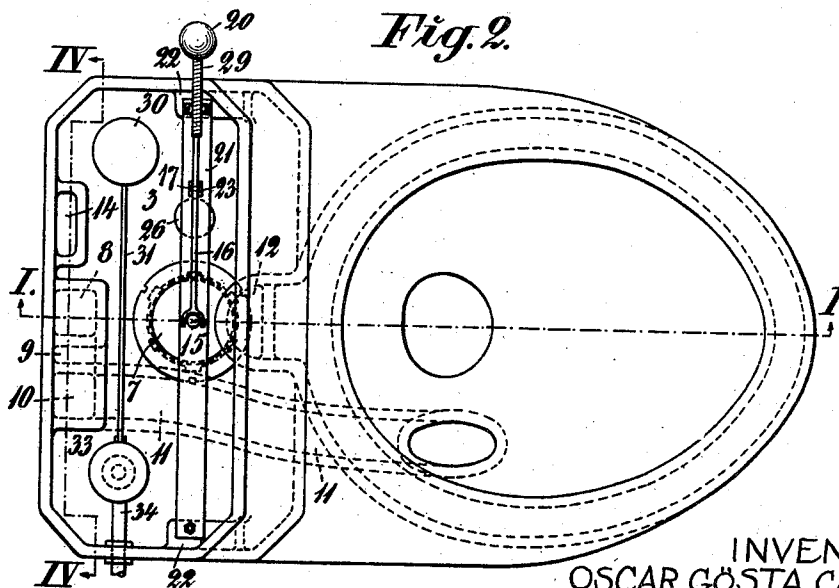
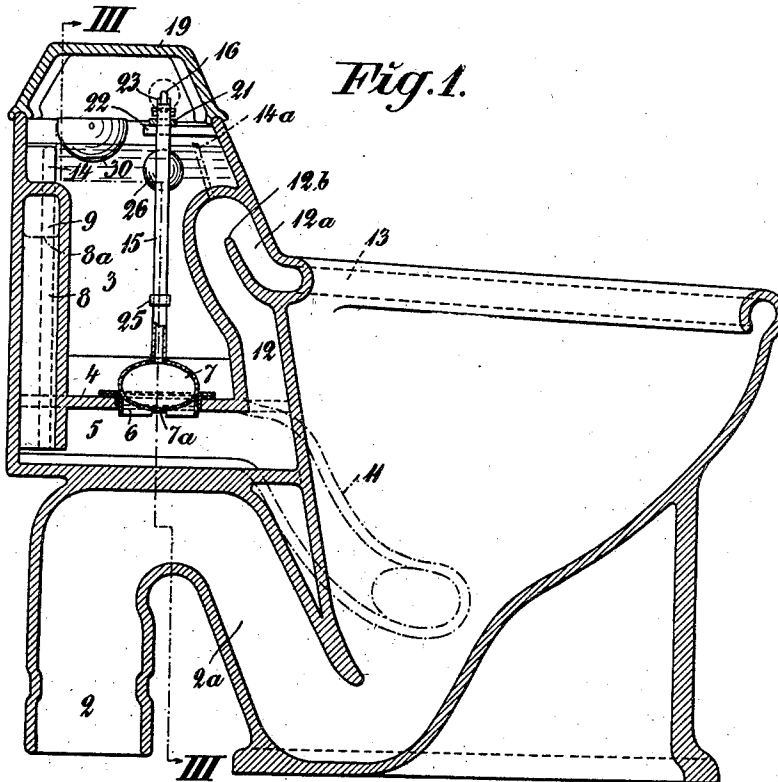
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2,244,530

LOW LEVEL WATER CLOSET

Filed March 22, 1939

2 Sheets-Sheet 1



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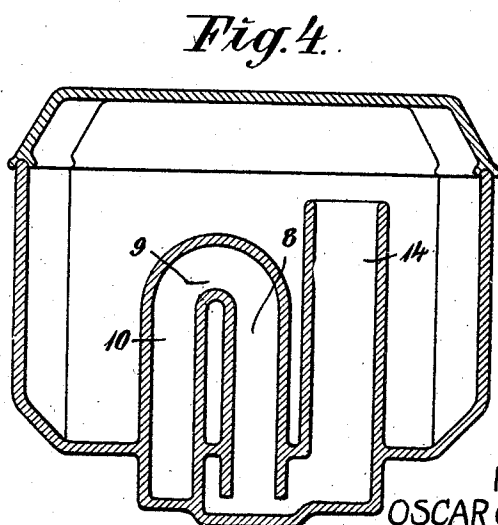
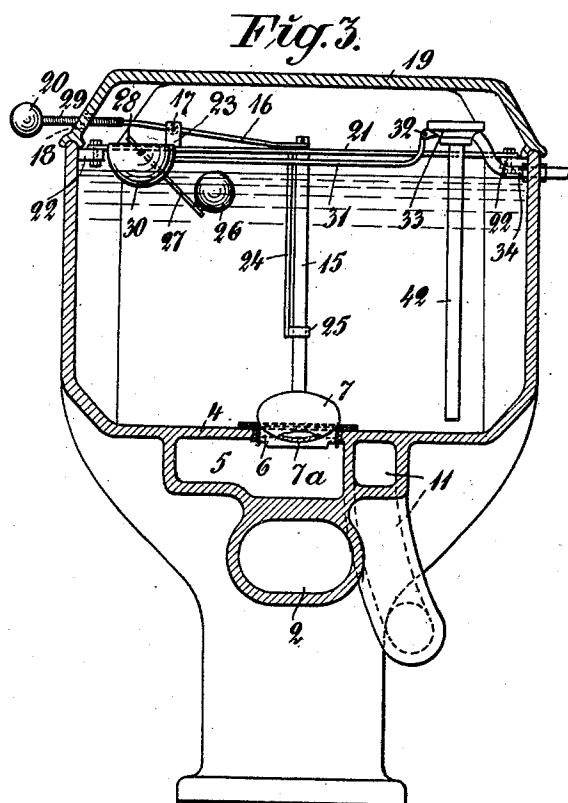
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UNITED STATES PATENT OFFICE

2,244,530

LOW LEVEL WATER CLOSET

Oscar Gösta Carlsson, Stockholm, Sweden

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In Sweden March 30, 1938

3 Claims. (Cl. 4-14)

The present invention relates to such low-level water closets, in which the closet bowl and the flushing water container are built together as a unit, and in which the highest water level of the flushing water container is above the upper rim of the closet bowl, while the bottom of the container is located below said rim, and the main object of the invention is to provide a means of connection between the water container and the closet bowl that water which has once entered the closet bowl shall under no circumstances give rise to the possibility of flowing back to the water container, as is now possible with known low-level water closets under certain circumstances, for instance when the outlet from the closet bowl becomes clogged or the like.

The water container with the present construction is thus protected against infection, which provides the great advantage that the valve member connected to the water conduit system and controlling the introduction of the flushing water into the water container, which valve member is located in said container and generally above the normal highest level, will be effectively protected against infection.

According to the invention, the object in view is realized by the feature that the connection between the water container and the closet bowl is constituted by siphons, there being one or more siphons opening into the closet bowl in the neighbourhood of the upper rim of the bowl to effect rim flushing of the bowl, and one or more siphons opening into the lower portion of the closet bowl to effect the main flushing of the bowl.

Should clogging up of the outlet of the closet bowl take place and the latter become filled with water entirely, a return flow of the water from the closet bowl back to the water container is rendered impossible, according to the invention, by the feature that the highest point of the siphons is located on a higher level than the upper rim of the closet bowl.

Other features characteristic of the invention will be set forth more fully in connection with the following description of one form of embodiment which is shown by way of example in the accompanying drawings.

Figs. 1 and 2 show a vertical section and a plan view respectively of the water closet, Fig. 1 being a section taken on the line I—I in Fig. 2, and the cover of the flushing water container being removed in Fig. 2.

Fig. 3 is a vertical section through the water closet taken on the line III—III in Fig. 1.

Fig. 4 is a vertical section taken on the line IV—IV in Fig. 2.

On the drawings 1 designates the closet bowl and 2 its discharge which is equipped with a water seal 2a. The closet bowl 1 is made integral with the flushing water container 3, in which the highest water level is situated above the upper rim of the closet bowl, whereas the bottom 4 of the container 3 is situated below the level of the upper rim of the closet bowl.

Below the bottom 4 a chamber 5 is arranged, which chamber communicates with the container 3 by way of a discharge opening 6 provided in the bottom 4. Said opening is controlled by the flushing valve 7. From the chamber 5 two siphons branch off for conveying flushing water to the closet bowl. One of the siphons effects the main flushing of the closet bowl, whereas the second siphon effects the rim flushing of the bowl. The siphon for the main flushing consists of the rising vertical channel 8, which at the top by means of the channel 9 communicates with the downwards directed channel 10 that merges into the channel 11 opening into the lower portion of the closet bowl wall. The second siphon for the rim flushing consists of the rising channel 12 which merges into the downwards directed channel 12a that opens into an annular passage 13 provided about the upper rim of the closet bowl.

According to the invention, the highest point 8a and 12b resp. of the main flushing siphon and rim flushing siphon respectively are situated at a level higher than the upper rim of the closet bowl so that if the closet bowl for some reason gets filled with water, none of this water and no germs contained therein may pass over to the flushing water container by way of the siphons.

The chamber 5 is further connected with the container 3 by way of an overflow passage 14. Instead of the overflow 14 an overflow passage 14a may be provided between the container 3 and the upper portion of the siphon 12, 12a.

The flushing valve 7 consists of a hollow body such as a ball or the like, which is provided on the underside with a restricted opening 7a and is secured to a hollow valve spindle 15, which connects the interior of the valve body 7 with the air in the upper portion of the container. The spindle 15 is connected at its top to the one arm of a lever 16 being pivotally journaled at 17 and passing through a slot 18 in the cover 19 of the container and ending with a handle 20 or a button 20 or the like. When the button

20 is depressed, the valve 7 is raised so that the container is emptied and the flushing of the closet bowl effected. The hollow valve body 7 being filled by air keeps itself suspended in the water during the flushing and sinks together with the water again towards its valve seat in the bottom 4 to close the discharge opening 6.

According to an embodiment a cross-bar 21 overbridging the container is secured to opposite sides of the upper portion of the container. It may be secured by screws to projections 22. The purpose of the cross-bar 21 is to carry as many as possible of the accessories in the container so that said cross-bar together with the accessories mounted thereon may be assembled in advance at the place of manufacture, whereby the work of assembling at the place of installation is reduced.

In the shown example the lever 16 is journaled in a fork-shaped bearing support 23 secured on the upper side of the cross-bar 21. The valve spindle 15 passes through a hole in the cross-bar 21 and is above the latter connected to the lever 16 in the indicated way. 24 is a vertical bar being secured to the cross-bar 21 and below provided with guiding means 25 for the valve spindle 15.

To prevent that the valve body 7 after a flushing operation is again raised before the container 3 has been refilled, a special auxiliary device is provided. This consists of an auxiliary float, such as a hollow ball 26, which is secured to a rod 27 that is pivotally journaled at the underside of the cross-bar 21 and is provided with an extension 28 passing through a slot in the cross-bar. The extension 28 is lying in the vertical plane through the lever 16. When the container 3 is filled, the float 26 and the extension 28 occupy the position shown in Fig. 3 so that the extension 28 does not prevent the turning of the lever 16 when effecting the flushing. Upon flushing, the lever 27 is turned to the left in Fig. 3 by the weight of the float 26 so that the extension 28 will point straightly upwards, whereby it will now prevent a new turning of the lever 16 until the container has been refilled with so much water that the float 26 due to its buoyancy may turn the arm 27 back again, whereafter the extension 28 will point obliquely, thus allowing a new flushing. To prevent the lever 16 from being deformed by hitting the extension 28, when the container is not yet filled, that portion 29 of the lever, which passes through the slot 28, is made from spirally wound wire so as to become resilient in a sufficient degree.

In the illustrated embodiment the following members will thus be mounted on the cross-bar 21 as a unit before the assembling at the place of installation:

The bearing support 23, the lever 17, the valve spindle 15 with the valve body 7, the bar 24 with the guide 25, and the auxiliary float 26 with the arm 27 and the extension 28.

30 designates the ordinary float being secured to a rod 31, which at 32 is pivotally journaled in a valve casing 33 containing a valve device for the inlet of flushing water to the container 3. The flushing water is admitted through the conduit 34 and is actuated over the valve (not shown) by the float 30 conducted to a vertical tube 42 ending in the neighbourhood of the bottom 4 of the container.

The tube 42 or the valve 33 is provided with

arrangements for preventing the water in the container to be sucked off into the conduit 34.

When flushing the closet bowl by raising the valve 7, water flows through 7a into the hollow body. By the fact, however, that the opening 7a is restricted and comparatively narrow, the water is prevented from entering the hollow body so rapidly as to fill the ball with water, before the container 3 has been emptied. However, if the container for some reason does not become emptied, or does not empty in the normal period of time for ordinary flushing, depending on the fact that the closet bowl is filled with water, more or less, by reason of the clogging up of the outlet 2, the valve 7 will get filled with water so as to sink down towards its seat so that flooding is prevented.

To effect the described mode of operation of the valve body 7, the size of the opening 7a has to be correspondingly selected so that upon normal flushing the water will enter the ball at such a slow rate that it has not time enough to destroy the buoyancy of the ball, whereas, if the container happened not to be emptied in the normal manner, water in such quantities would enter the ball through the opening 7a so as to fully counteract said buoyancy and make the ball 7 sink towards the valve seat and close the discharge opening 6.

Having now particularly described the nature of my invention and the manner of its operation what I claim is:

1. In a low-level water closet structure comprising a closet bowl, a flushing tank integral with said bowl, and manually operable flushing means to effect flushing of the bowl proper and of the rim portion thereof by separate jets of flushing water, the combination of a receiver chamber for flushing water on a level intermediate the bottom of said bowl and the rim portion thereof, an inverted U-passage extending upwardly from said receiver chamber and discharging downwardly into the rim portion of said bowl and having its apex section located in its entirety above the level of the bowl rim and below the water level of the flushing tank when filled, and a second inverted U-passage extending upwardly from said receiver chamber and forming a siphon by discharging downwardly into the bowl proper through an exit below the level of said receiver chamber and having its apex section located in its entirety above the level of the bowl rim and below the water level of the flushing tank when filled.

2. In a low-level water closet structure comprising a closet bowl, a flushing tank integral with said bowl, and manually operable flushing means to effect flushing of the bowl proper and of the rim portion thereof by separate jets of flushing water, the combination of a receiver chamber for flushing water on a level intermediate the bottom of said bowl and the rim portion thereof, an inverted U-passage extending upwardly from said receiver chamber and discharging downwardly into the rim portion of said bowl and having its apex section located in its entirety above the level of the bowl rim and below the water level of the flushing tank when filled, and a discharge controlling hollow flush valve seated between said flushing tank and said receiver chamber and having a restricted refill and exit opening therein.

3. In a low-level water closet structure comprising a closet bowl, a flushing tank integral with said bowl, and manually operable flushing

means to effect flushing of the bowl proper and of the rim portion thereof by separate jets of flushing water, the combination of a receiver chamber for flushing water on a level intermediate the bottom of said bowl and the rim portion thereof, an inverted U-passage extending upwardly from said receiver chamber and discharging downwardly into the rim portion of said bowl and having its apex section located in its entirety above the level of the bowl rim and

below the water level of the flushing tank when filled, and a discharge controlling hollow flush valve seated between said flushing tank and said receiver chamber and having a restricted refill and exit opening therein, and an overflow passage provided in the flushing tank and opening into said receiver chamber below the bottom of the tank.

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