P. C. HUNTER.

MARINE TOILET.

APPLICATION FILED APR. 12, 1918.

1,278,665. Patented Sept. 10, 1918.

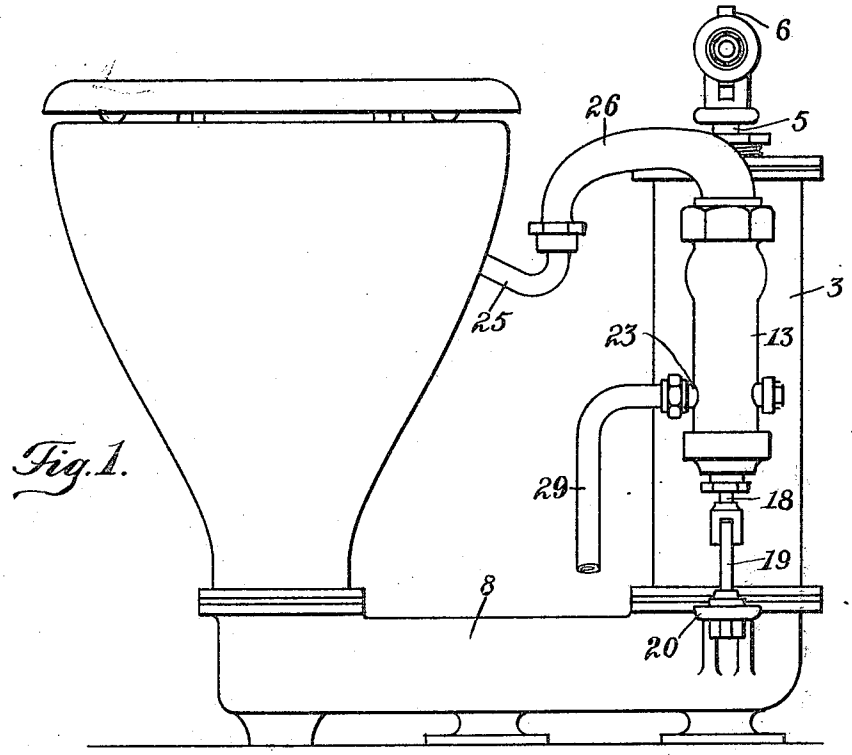


Fig. 1.

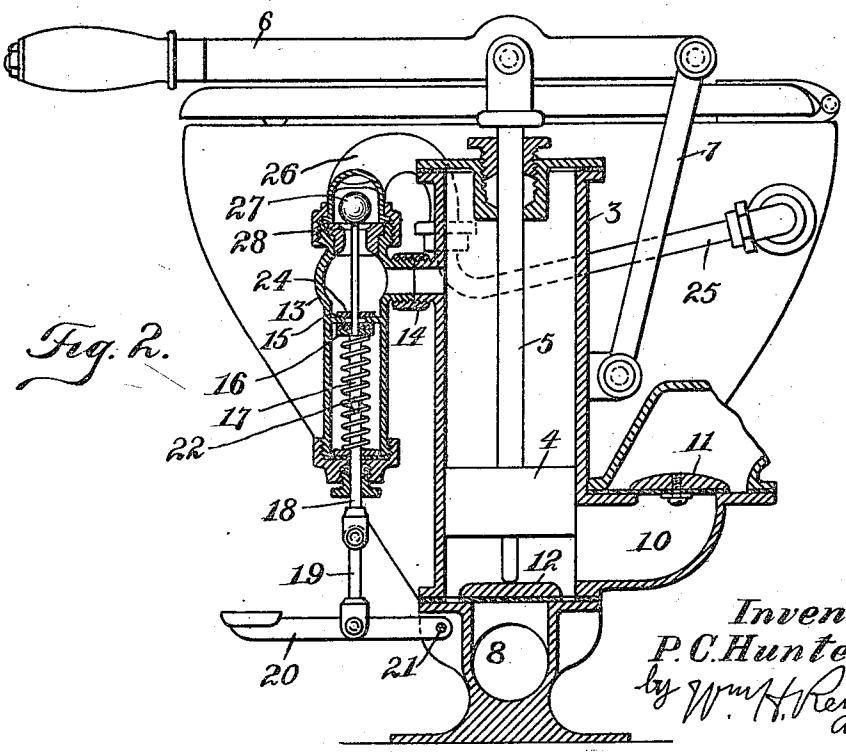


Fig. 2.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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MARINE TOILET.

1,278,665. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed April 12, 1918. Serial No. 228,076.

To all whom it may concern:

Be it known that I, PETER C. HUNTER, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Marine Toilets, of which the following is a specification.

This invention relates to toilet apparatus for use in boats of various kinds where the flushing water is pumped directly from the outside of the boat, and operated mechanically instead of having a supply of water from a tank or other source under pressure.

The object of the invention is to simplify the control for the main pump, and to utilize the necessary air vent for the direct outlet from the pump to the bowl.

In the accompanying drawing showing one embodiment of my invention, Figure 1 is a front elevation; and Fig. 2 is a vertical section through the pump and control device.

In the drawing I show a pump device of the usual form comprising a cylinder 3 in which slides the piston 4 by piston rod 5, operated by the hand lever 6, that swings on the link 7. At the lower end of cylinder base 3 is a pipe connection 8 leading into the bottom of the bowl 9. The pump has an outlet at 10 controlled by a check-valve 11, while a check-valve 12 admits fluid into the cylinder but prevents discharge therefrom; and the valve 11 permits discharge but prevents back flow from the outlet. This construction is in general use with this class of toilets.

At one side of the pump cylinder is arranged a valve chamber 13 having a connection at 14 with the upper portion of the cylinder 3 above its piston 4, and it will be observed that the pump cylinder has no other outlet above the piston 4 except this connection, that serves as both inlet and outlet for the flushing water. In the valve chamber 13 below the connection 14 is arranged a valve seat 15, whose lower face is engaged by a valve 16 fast on a valve stem 17, that projects through the lower end 18 of the valve chamber, and also extends up through the valve seat. This valve stem has an extension 19 hinged to a feed lever 20 that is pivoted at 21 to the base of the pump cylinder 3. A coil spring 22 tensioned between the valve 16 and the chamber end 18 serves to normally hold the valve seated, and on depression of the foot lever to open the valve, will again seat the valve on release of such lever. The valve chamber 13 is provided with an inlet connection below the valve seat 15, a connection 23 being shown, that extends downwardly, and is usually passed through the boat to the outside water to receive the supply. A check-valve is also provided on the valve at its upper part that can close the valve seat when the foot lever holds the valve 16 open. As shown I provide a circular plate or washer 24 surrounding the valve stem closely but slidable thereon, that will fall by gravity or from back pressure in the valve chamber, on to the seat and close its opening, it being understood that the valve stem 17 is offset from the valve seat to permit the flow of water. Structures of a similar nature to that so far described are in use at present, and my improved construction relates particularly to the outlet for the valve chamber 13, whereby the usual outlet for the pump cylinder 3 is omitted.

Instead of having a mere air vent at the top of the valve chamber 13, I arrange a water outlet leading directly to the flush inlet at the upper portion of the bowl, by the usual connection 25. At the upper part of the valve chamber 13 I provide an outlet portion 26 that connects with the said pipe 25. At this connection I arrange a check-valve, and provide means for normally holding the check-valve unseated, so that when the piston 4 is forced downward air can be drawn in through the connection 25 from the bowl and through the outlet 26. But when it is desired to use this down stroke as a suction stroke, this valve is permitted to close. As shown I arrange a ball valve 27 engaging the valve seat 28 at the outlet 26, and the valve stem 17 is extended upward so that in the normal seated position of the valve 16 on this stem, the valve stem will engage and hold the ball valve 27 lifted from its seat and prevent its seating. But depression of the foot lever 20 to unseat the valve 16, will lower the valve stem so that the ball valve will fall and seat itself.

The operation of these parts is as follows: Whenever the piston 4 is drawn upwardly by the lever 6, the valve 12 will rise and a suction will be produced that will act through the pipe connection 8 to withdraw the contents of the bowl at the lower portion. On the down stroke of the piston the valve 12 will close, and the fluid drawn into the piston will be forced through the outlet 10, by raising the check valve 11. The

rising of the piston 4 will cause air that may be in the cylinder 3 above the piston 4, to find exit around the raised valve 27 and through the pipe 25 connecting with the bowl at its inlet. When the piston 4 moves downward, if the valve 27 is held raised by the valve stem, as shown, the atmospheric air will be drawn in through pipe 25 around the valve 27, and pass through the connection 14.

But when the foot lever 20 is depressed the valve 16 will be unseated, and the ball valve 27 will fall and seat to close the outlet 26. If the piston 4 is now raised the air will be driven out of the cylinder 3, and passing through the connection 14 into the valve chamber, can find exit by raising the ball valve 27. On forcing the piston 4 downward the cylinder will be exhausted, and the ball valve 27 will be held seated by atmospheric pressure. This will exhaust the valve chamber, and the valve 16 being now open the exhaust action will extend down to the water inlet 23, and the water will be drawn in through the pipe 29 connecting with this inlet, from the outside water. This water will pass around the valve seat 15, and will raise the washer valve 24, and pass into the valve chamber above the valve seat, and through the connection 14 into the cylinder 3 above the piston. The piston being next drawn upward the water in the cylinder above the piston will be forced through the connection 14 into the valve chamber, and the pressure on this water will cause the ring valve 24 to engage the valve seat 15 to prevent escape of the water through the inlet pipe. Hence the force on the water against the ball valve 27 will raise this valve and the water must find exit through the pipe 25 and thereby be forced into the upper portion of the bowl. Several strokes will fill the cylinder 3 and valve chamber at the down stroke of the piston so that as soon as the piston is drawn upward the water will be strongly forced out through the pipe 25 into the bowl. But this reciprocation of the piston will at the same time draw all the contents of the bowl at its lower portion through the bottom connection 8, and discharge such fluid through the outlet 10. Such operation will continue as long as the lever 6 is operated and the foot lever held depressed. On release of the foot lever the inlet for the water will be closed, and the ball valve 27 again opened. Therefore the continued operation of the hand lever 6 will simply serve to draw off the contents of the bowl through the lower connection, without any further supply of the feed water.

It will be understood from this arrangement that my improved construction combines the outlet for the feed water, with the air vent, so that this part of the apparatus performs both functions. Such a device is of strong construction and operation and is not liable to become easily deranged or injured; at the same time it simplifies the construction and reduces the cost of the apparatus.

What I claim is:—

1. In a marine toilet, the combination with a force pump of the double-acting form comprising a cylinder and a piston, and a connection at one end of the cylinder with the bowl outlet and an outlet at said end of the cylinder, of a valve chamber connected with said piston at its other end portion from said bowl connection, said valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its other end beyond the cylinder connection arranged to connect with the bowl flush inlet, and a valve in said latter outlet arranged to close to prevent air admission at such portion, and to be raised by water forced from the said cylinder into the valve chamber, to permit discharge by said piston of the feed water around the outlet valve to the bowl.

2. In a marine toilet, the combination with a force pump of the double-acting form comprising a cylinder and a piston, and a connection at one end of the cylinder with the bowl outlet and an outlet at said end of the cylinder, of a valve chamber connected with said piston at its other end portion from said bowl connection, said valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its other end beyond the cylinder connection arranged to connect with the bowl flush inlet and a valve in said latter outlet arranged to close to prevent air admission at such portion, and to be raised by water forced from the said cylinder into the valve chamber, to permit discharge by said piston of the feed water around the outlet valve to the bowl, said valve stem being arranged when in the normal closed position to engage and hold said second valve raised and to release such valve when opened.

3. In a marine toilet, the combination with a force pump of the double-acting form comprising a cylinder and a piston, and a connection at one end of the cylinder with the bowl outlet and an outlet at said end of the cylinder, of a valve chamber connected with said piston at its other end portion from said bowl connection, said valve chamber having a valve

seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its other end beyond the cylinder connection arranged to connect with the bowl flush inlet, and a valve in said latter outlet arranged to close to prevent air admission at such portion, and to be raised by water forced from the said cylinder into the valve chamber, to permit discharge by said piston of the feed water around the outlet valve to the bowl, and a check-valve arranged to engage said valve seat in the chamber to prevent discharge of the feed water through the valve seat when the stem valve is open.

4. In a marine toilet, the combination with a force pump of the double-acting form comprising a cylinder and a piston, and a connection at one end of the cylinder with the bowl outlet and an outlet at said end of the cylinder, of a valve chamber connected with said piston at its other end portion from said bowl connection said valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, to engage said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its other end beyond the cylinder connection arranged to connect with the bowl flush inlet, and a valve in said latter outlet arranged to close to prevent air admission at such portion, and to be raised by water forced from the said cylinder into the valve chamber, to permit discharge by said piston of the feed water around such valve to the bowl.

5. In a marine toilet, the combination with a force pump of the double-acting form comprising a cylinder and a piston and a connection at one end of the cylinder with the bowl outlet and an outlet at said end of the cylinder, of a valve chamber connected with said piston at its other end portion from said bowl connection said valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber to engage said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its other end beyond the cylinder connection arranged to connect with the bowl flush inlet, and a valve in said latter outlet arranged to close to prevent air admission at such portion, and to be raised by water forced from the said cylinder into the valve chamber, to permit discharge by said piston of the feed water around such valve to the bowl, said valve stem being arranged to engage and hold said outlet valve raised in the normal closed position and to release such valve when its valve is opened, and a check-valve arranged to engage said valve seat in the chamber to prevent discharge of the feed water through the valve seat when the stem valve is open.

6. A toilet control comprising a valve chamber provided with a pump connection at one side, the valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against the lower face of said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its upper end beyond the cylinder connection adapted to connect with the bowl flush inlet, and a check valve in said latter outlet normally closed to prevent air admission at such portion, but arranged to be raised by water forced from the pump connection into the valve chamber to permit discharge of the feed water around the valve to the bowl.

7. A toilet control comprising a valve chamber provided with a pump connection at one side, the valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against the lower face of said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its upper end beyond the cylinder connection adapted to connect with the bowl flush inlet, and a check valve in said latter outlet normally closed to prevent air admission at such portion, but arranged to be raised by water forced from the pump connection into the valve chamber to permit discharge of the feed water around the valve to the bowl, said valve stem being arranged to engage and hold said outlet valve raised in the normal closed position and to release such valve when its valve is opened.

8. A toilet control comprising a valve chamber provided with a pump connection at one side, the valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against the lower face of said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its upper end beyond the cylinder connection adapted to connect with the bowl flush inlet, a check valve in said latter outlet normally closed to prevent air admission at such portion, but arranged to be raised by water forced from the pump connection into the valve chamber to permit discharge of the feed water around the valve to the bowl, and a check-valve arranged to engage said valve seat in the chamber to prevent discharge of the feed water through the valve seat when the stem valve is open.

9. A toilet control comprising a valve

chamber provided with a pump connection at one side, the valve chamber having a valve seat below said connection, a valve stem and valve working in the valve chamber, a spring on the valve stem normally pressing the valve against the lower face of said seat, a feed water inlet in the chamber below said valve, the valve chamber having an outlet at its upper end beyond the cylinder connection adapted to connect with the bowl flush inlet, a check valve in said latter outlet normally closed to prevent air admission at such portion, but arranged to be raised by water forced from the pump connection into the valve chamber to permit discharge of the feed water around the valve to the bowl, said valve stem being arranged to engage and hold said outlet valve raised in the normal closed position and to release such valve when its valve is opened, and a check-valve arranged to engage said valve seat in the chamber to prevent discharge of the feed water through the valve seat when the stem valve is open.

Signed at New York city, N. Y., on April 11, 1918.

PETER C. HUNTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."