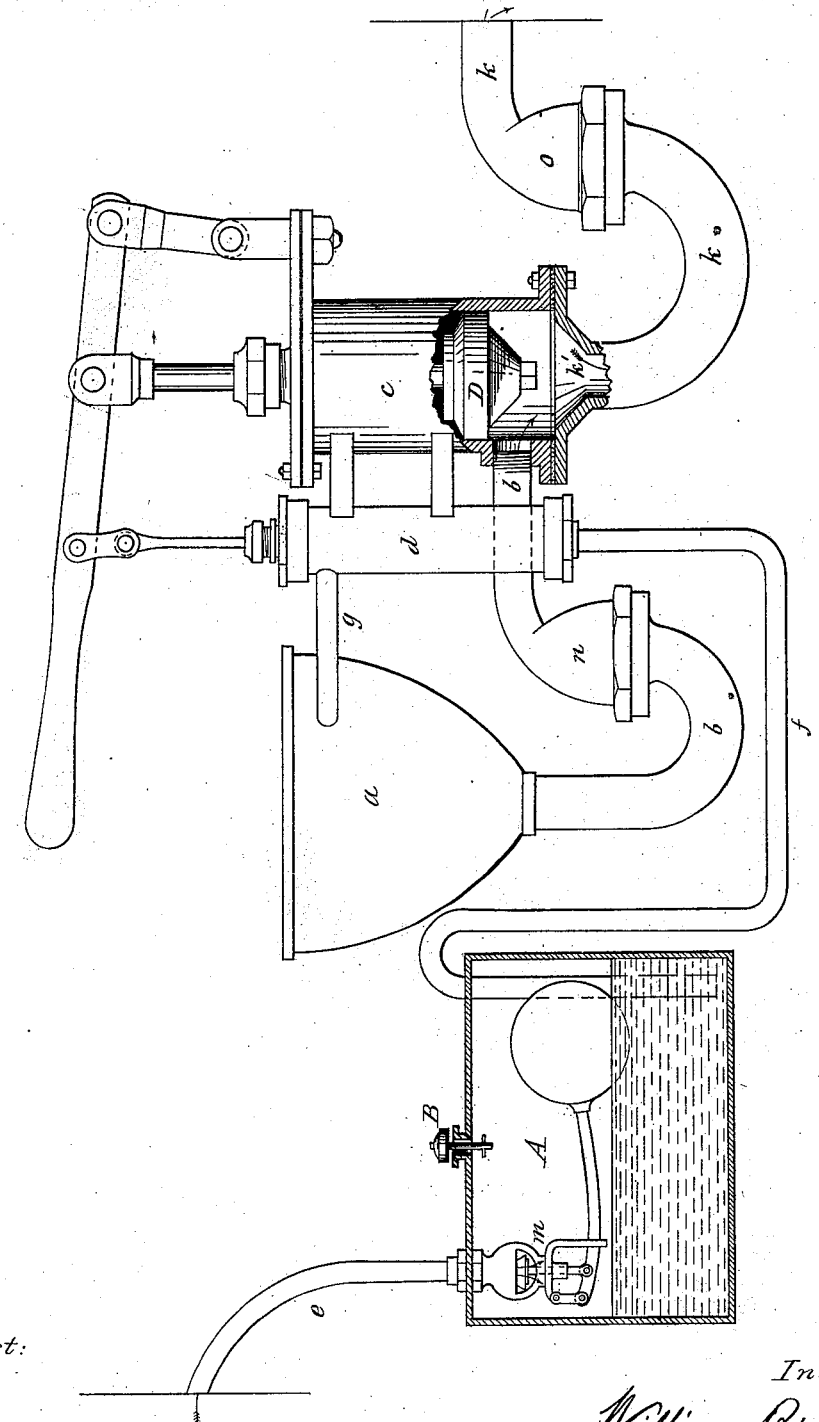
W. BISHOP.
Water-Closet.

No. 205,036. Patented June 18, 1878.



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IMPROVEMENT IN WATER-CLOSETS.

Specification forming part of Letters Patent No. **205,036**, dated June 18, 1878; application filed May 25, 1878.

To all whom it may concern:

Be it known that I, WILLIAM BISHOP, of New York city, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification:

My invention relates more particularly to marine closets, and to that class known as "pump-closets," where the closet is flushed by the operation of a pump connecting with the water-supply and discharging into the bowl, while a separate pump withdraws and discharges the contents of the bowl. In this class of closets a liability exists, under certain conditions, of the sea-water leaking through the connecting-pipes of the closet and flooding the same; and to obviate this defect is the main object of my invention, which embodies three distinct features to this end, as hereinafter set forth.

The drawing represents a side elevation of my improved water-closet, the parts of which are somewhat disarranged from their usual positions, to better illustrate all parts of the invention.

In the drawing, *a* represents the bowl of the water-closet; *c*, the soil-pump, which connects with the bowl by the soil-suction pipe *b*, through which the contents of the bowl are drawn into the soil-pump *c*, which discharges the same through the soil-discharge pipe *k* into the sea. *d* is the water-flushing pump, which connects with the water-supply at one end and with the bowl at the other, as shown.

The first feature of my invention consists in combining an automatically-supplied water-tank, A, with a pump water-closet. This tank A intervenes between the water-supply and the pump, being situated preferably below the pump's discharge, as shown, and is connected with the water-supply by the pipe *e*, which, in case of a marine closet, extends out through the side of the vessel and opens into the sea.

The discharge of the supply-pipe in the tank is controlled by an automatically-acting float-valve, *m*, which acts in the well-known manner to retain a constant level of water in the tank, as will be understood.

The pump *d* connects with the tank by the pipe *f*, and the discharge from the pump is delivered through the pipe *g* into the bowl in the usual manner.

To duly appreciate the objects and advantages of this feature of the invention, it is proper to state that in marine closets it is usually desirable to have the closets situated near, or not far below, the water-line, and as the head of water is not sufficient in this situation, a pump is hence desirable to give an effective supply when the closet is used; but as it is not desirable to have the pump-piston so tight-fitting as to be water-tight, and, moreover, as all the valves of the water-pump open in the direction of the inflow, it will thus be observed that a constant leakage through the water-pump and an overflow of the closet would result if a pressure of water were allowed to constantly bear on the pump. Hence, when the pump is connected directly with the sea or source of supply, as is usual, a complicated arrangement of vented siphon-pipes and shut-off cocks is generally used to connect the pump with the sea, so as to prevent the sea leaking in through the pump when the closet is not in use. When the vessel assumes a careening position, however, the head of water becoming much increased, a leakage will occur, notwithstanding the siphon-pipes, unless precaution is taken to close the shut-off cocks.

It will hence be observed that the important advantage of the combination of an automatic supply-tank with the pump-closet intervening between the source of supply and the pump, and placed below or at the level of the pump's discharge, is, that as the supply and pressure from the sea is thus controlled and automatically cut off by the float-valve of the tank, all pressure is thus taken off the pump when at rest, so that no leakage can possibly occur through the same, while at the same time the tank affords a constant and ever-ready supply to the pump as the same is demanded. Hence the closets may be placed either above or below the water-line, and the tank be situated much below the water-line, in order to get a good head for supplying the same, without fear of leakage, without extra care or attention, and without regard to the position of the vessel.

Another feature of my invention lies in the

construction of the tank itself; and it consists in having it inclosed on all sides, as shown in the drawing, and providing it with an externally-opening air-vent valve, B. By this construction two important results are accomplished. First, it will be observed that the closets may thus be situated much below the level of the tank and far below the level of the water-line, or source of the tank's supply, and yet no leakage can possibly take place through the water-pump when the closet is at rest, although the tank and the pump-connections be filled with a heavy column of water, for the reason, as will be observed, that the inclosed tank and externally-closing valve furnish no vent to the top of the column, and hence the atmospheric pressure at the bottom prevents its leaking out through the pump. When the pump is worked, however, the extra suction causes the expansion of the air within the tank and the consequent outflow of the water to supply the demands of the pump. Secondly, it will be seen that as a partial vacuum will be formed in the inclosed tank by the action of the pump, the float-valve will be thus rendered more sensitive, and the supply to the tank will be rendered more rapid and certain than it otherwise would be, even though the situation of the tank be very near the water-line; or, in fact, by means of this construction, the situation of the tank may be above the water-line, and yet the supply to the tank will be insured.

The inclosed tank thus possesses a most important function for the purposes of a water-closet.

While the tank, as thus described, may be situated either above or below the water-line, and while, also, the closets may be situated below the tank, yet I prefer to situate the tank considerably below the water-line, and to elevate the closets slightly above the tank, as shown in the drawing, so that the discharge from the pump is elevated above the water-level of the tank, as before mentioned, as in this situation the water of the tank has no tendency to escape through the pump when at rest.

The third feature of my invention lies in the construction of the soil-pump, and relative arrangement of the soil, suction, and discharge pipes thereof. This feature consists in forming the soil-pump cylinder *c* with the soil-suction inlet *b* from the bowl *a* arranged on the side of the cylinder, while the soil-discharge *k* of the pump is arranged in the bottom of the pump-cylinder, the pump-piston D being constructed to act as a valve, so that in its descent the side of the piston closes the lateral orifice of the suction-inlet *b*, and the bottom of the piston seats itself on the aperture *k'* of the soil-discharge, which is adapted as a valve-seat for the valve-piston, as represented in the drawing. The soil-pump piston, in its descent, thus forms of itself a double cut-off on the soil-pipes, which, in connection with the check-valves *n o* in the suction and discharge pipes *b k*, forms a quadruple cut-off, effectually preventing any back-flow of the sea-water through the soil-pipes of the closet, and also effectually preventing any return of gas or odor.

While the constructions described are more specially designed for marine closets, they may, of course, be also employed for house-closets, when desirable, without departing from the scope of the invention.

What I claim as my invention is—

1. The combination, with a pump water-closet, of a water-supply tank, A, disposed between the water-supply and the water-pump, and provided with an automatically-acting supply-valve, by means of which a constant water-supply is afforded the pump, while the pressure is removed from the pump and danger of overflow or leakage through the same prevented, substantially as herein set forth.

2. The combination, with a pump water-closet, of a water-supply tank, A, inclosed on all sides, and provided with an externally-closing air-vent valve, B, and also an internal automatically-acting supply-valve, *m*, substantially as and for the purpose set forth.

3. In a pump water-closet, a soil-pump, *c*, having the soil-inlet *b* arranged on the side of the pump-cylinder, in the path of the piston, and the soil-discharge *k* arranged through the bottom of the cylinder, under the piston, with the piston D, constructed to act as a valve, which, in its descent, closes the orifice of both the soil-inlet and soil-discharge, substantially as herein shown and described.

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Witnesses:
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