

(No Model.)

T. A. MACDONALD.
WATER CLOSET FOR YACHTS OR VESSELS.

No. 591,190.

Patented Oct. 5, 1897.

FIG. 1

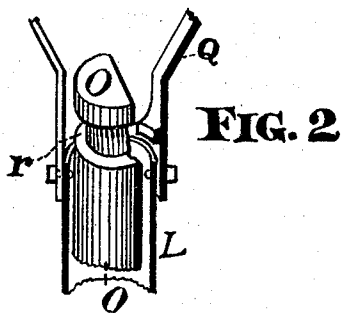
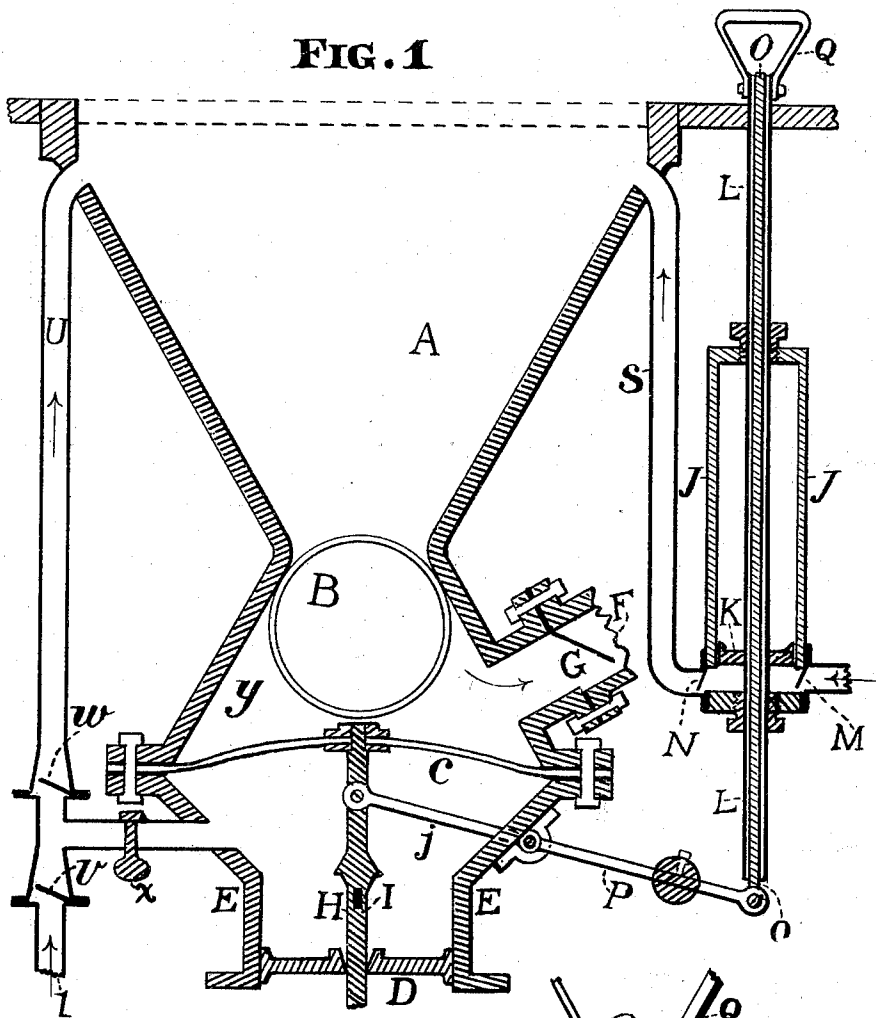


FIG. 2

WITNESSES:

Daniel J. Wiseman
Thos. Moulton

Thomas A. MacDonald INVENTOR

UNITED STATES PATENT OFFICE.

THOMAS ANDERSON MACDONALD, OF BOSTON, MASSACHUSETTS.

WATER-CLOSET FOR YACHTS OR VESSELS.

SPECIFICATION forming part of Letters Patent No. 591,190, dated October 5, 1897.

Application filed August 28, 1894. Serial No. 521,568. (No model.)

To all whom it may concern.

Be it known that I, THOMAS ANDERSON MACDONALD, a citizen of Canada, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Water-Closets for Yachts or Vessels, of which the following is a specification.

My invention relates to improvements in yacht water-closets in cases where it is necessary to place them below or at the water-line or a little above it, whereby I gain the following advantages, viz: safety, simplicity, and ease of operation, efficiency, cleanliness, and compactness, being well adapted to all the various circumstances and conditions and accomplishing the various objects required of such devices. I obtain these objects by the device or mechanism illustrated in the accompanying drawings, referring to which—

Figure 1 represents a vertical section of the entire mechanism embodying my invention. Fig. 2 is a detail section of the device for attaching and detaching the rod O O from the handle Q, which operates the vertical supply or flushing pump J J K.

In Fig. 1, A represents a water-closet bowl. B represents a floating sphere or valve which closes the aperture at the bottom of bowl A in its normal condition and when the flexible diaphragm C is forced up, but which recedes and allows the contents of the bowl A to pass down through said aperture when the flexible diaphragm C is forced down.

C is a flexible diaphragm operated or forced up and down by lever P, which is attached to the vertical rod O O, the lever P being sufficiently weighted on the outer end to keep the diaphragm C and valve B normally up, so as to prevent the sea from backing up into the bowl A. It also forms a seal, preventing offensive odors or gases from passing up through bowl A.

D is a piston which is within the shell or walls E E and which may be attached to piston-rod H by a key in slot I and operated or forced up and down by the same means as that which operates the flexible diaphragm C, thus forming an ordinary piston-pump if at any time at sea or under circumstances not convenient for repairing the diaphragm C

should become porous or inoperative. It also forms a guide for piston-rod H and is a safeguard in case of accident to diaphragm C, in which case the contents of bowl A would flow into the yacht or vessel.

F is a discharging-outlet to the sea, having check-valve G.

J J form the walls or cylinder of an ordinary piston-pump which is used to pump clean water to flush the bowl A.

K is a piston within the cylinder J J and is attached to a hollow tube or piston-rod L L, the handle Q being attached to the top of same.

O O is a rod which, passing through the hollow tube L L, connects the end of lever P with the pump-handle Q. The means of attaching and detaching the same is illustrated in Fig. 2, referring to which, r is a slot made partially around the upper end of rod O O, one side of which is cut away, so as to allow the semiannular projection on the inner side of handle Q to pass down parallel with slot r, and when it is desired to operate the diaphragm or discharging pump the handle Q is turned partially around the projection on the inner side of the handle, moving in slot r, becomes attached to rod O O, and operates the discharging-pump in conjunction with the supply or flushing pump, which is necessary to thoroughly wash the bowl A.

R is the clean-water inlet or suction pipe to supply or flushing pump, and M is a check-valve in same. S is a pipe connecting the discharge-outlet of the supply-pump with the top of bowl A, and N is a check-valve in same.

U is a pipe which connects the wall inclosing the chamber j under diaphragm C with the top of bowl A and has check-valve w, as shown, also pipe l with check-valve v. Air is admitted through pipe l on the uptake of diaphragm C and is forced through pipe U to the top of bowl A, thus forming an air-vent and allowing the diaphragm C to be operated easily; but in small yachts or cases where there is not sufficient room to place the vertical flushing-pump J J K, as shown, and when it is more convenient and compact to use the lower end of the diaphragm-pump with pipes U and l and check-valves v and w for flushing the bowl A instead of the vertical flush-

ing-pump J J K, then the pipe *l* is connected to the shell or outside planking of the vessel, and by the operation of diaphragm C clean sea-water is pumped into the top of bowl A instead of air. The stop-cock *x* is to be closed in case of accident to diaphragm C and when the piston D is to be used to pump out the contents of bowl A.

Among the objects required of a yacht water-closet none are more difficult to attain than the object of adaptability, for sailing craft are so variously constructed, not two having exactly the same room and requirements for such devices, some being set close to the slanting bottom of the yacht or vessel, while others are set a little above the water-line, yet not sufficiently above it to insure at all times a natural flow from the bowl to the sea, and in some cases where the floor-space is very small the most compact device possible is needed, in which case the bowl A has a double-acting diaphragm-pump C, located immediately under it, and pipe *l* to the outside planking, the pump being operated by handle Q and rod O O and lever P, thus forming the most compact device possible for pumping out the bowl and flushing it; but where it is possible or convenient to use the vertical flushing-pump J J K in conjunction with the diaphragm-pump at the bottom of the bowl this is preferred on account of the ease and simplicity of operating the closet by a single handle and using the piston D as a safeguard. When the diaphragm C is used for both discharging and flushing the bowl A at the same time, then the pressure of the sea against the clean-water side of the diaphragm materially assists in forcing the soil out into the sea through inlet F—in other words, the pump is counterbalanced by the sea-pressure, thus making it easy to operate. A separate device or valve is used for shutting off or controlling the flow of the clean-sea-water supply to the pipes R and *l*, which allows air to pass into these pipes instead of water when it is not desired to pump clean water into the top of bowl A while discharging its contents, and though this separate device or attachment is not shown in the drawings it is considered necessary to make a note of it here to show that this closet is not impracticable in its operation.

A spring or other device for holding down the outer end of lever P, instead of a weight, as shown and described above, may be used.

In constructing a water-closet for yachts and vessels it is important that it should first be safe, especially where they are placed below the sea-level. In this closet safety from flooding or sinking the yacht or vessel through the bowl is doubly insured, first, by the check-valve F, preventing the sea-water from backing up into the chamber Y, containing the floating valve or sphere B, and, secondly, by the valve or sphere B, being normally held up by the diaphragm C or the upper end

of piston-rod H, thus keeping the aperture at the bottom of bowl A constantly closed whether there is any water in the chamber Y to force the floating sphere or valve B up or not. This also insures against offensive or dangerous gases passing up into or through the bowl A whether there is a water seal or not, and when, as in large ships or steamers, where the closet is or may be set sufficiently above the sea-level to generally allow a natural flow from the bowl to the sea, then the means for pumping out or discharging the soil from the bowl to the sea are dispensed with and the chamber Y at the bottom of the bowl, with the floating valve B, forms in a certain degree an automatic pump and a sure preventive against flooding the bowl or sinking the ship when in a heavy sea, for the rolling and pitching of the vessel and the relative rise and fall of the sea so operate on the floating valve B within the chamber Y and the check-valve G in outlet F that the bowl is kept free from water, and when the closet is set sufficiently below the water-line to insure a flow of clean water into the top of bowl A at all times then all means or devices shown in the drawings for flushing the bowl are not used, and a pipe connecting the outside planking or shell of the vessel to the top of the bowl, with a shut-off valve in it, is used.

Thus it will be seen that with this entire mechanism or device, or some parts of it, all the requirements under all the various circumstances and conditions for which such devices are used are accomplished with safety, ease of operation, and economy of construction and of space required to set it in being adaptable, efficient, and compact in one device, and a construction of great utility.

I am aware that prior to this my invention other devices—viz., ordinary piston and plunger pumps with various means for operating them—have been made and used for discharging the soil from water-closet bowls and for pumping clean water into them in cases where such devices must be set in yachts and vessels below the water-level and above it. Therefore I do not claim, broadly, such a device; but

What I do claim particularly as my invention, and desire to secure by Letters Patent, is—

1. In a water-closet the combination of a bowl or reservoir a chamber below said bowl a flexible diaphragm in said chamber and a floating sphere or valve operating as a check-valve having its seat against or at the upper part of the said chamber and means for operating said diaphragm substantially as described.

2. In a water-closet the combination of a bowl or reservoir having a chamber Y at its bottom, a loose floating sphere or valve B, operating as a check-valve in closing an aperture between the bowl or reservoir A and chamber Y', a flexible diaphragm C provided

with a device for operating it, and a discharge-opening F for said chamber Y provided with a check-valve G.

3. In a water-closet the combination of a bowl or reservoir A: chamber Y a check-valve having its seat against or at the upper part of said chamber Y flexible diaphragm C in said chamber provided with means for operating it: discharge-opening F provided with check-valve G: casing E, E, forming chamber j: pipe U having check-valve *w* and connected to chamber j and to the top of bowl A: pipe *l* having check-valve *v* and connected to chamber j.

4. In a water-closet the combination of a bowl or reservoir a chamber below said bowl a loose floating sphere or valve operating as a check-valve having its seat against or at the upper part of said chamber: discharge-opening F having check-valve G: casing E, E: piston D within casing E, E, and provided with means for attaching and operating it.

5. In a water-closet the combination of bowl A: chamber Y below said bowl discharge-opening F provided with check-valve G floating check-valve B: flexible diaphragm C casing E, E, pipes U and *l* connected to said casing E, E, and provided with check-valves *w* and *v*, pipe U being also connected to the top

of bowl A, piston D provided with means for attaching and operating it substantially as described.

6. In a water-closet the combination of bowl A chamber Y below said bowl: discharge-opening F for said chamber Y and provided with a check-valve G: floating check-valve B in said chamber Y, and flexible diaphragm C: lever P attached to said diaphragm C forming a pump for discharging the contents of bowl A walls or cylinder J, J, having suction and discharge pipes R and S, provided with check-valves M and N piston K: hollow piston-rod L L, attached to said piston K: handle Q having a semiannular projection on the inner side of same and attached to said hollow piston-rod L L forming a pump for flushing bowl A: rod O, O, passing through hollow piston-rod L, L, and having its lower end attached to lever P and having a slot *r* in its upper end, all being so arranged that one or both pumps may be operated at one and the same time by handle Q substantially as and for the purposes described.

THOMAS ANDERSON MACDONALD.

Witnesses:

GEO. WM. WAITE,
M. F. WAITE.