(No Model.) 2 Sheets—Sheet 1.

H. IVES.

SHIP'S WATER CLOSET.

No. 587,735. Patented Aug. 10, 1897.

Fig. 1.

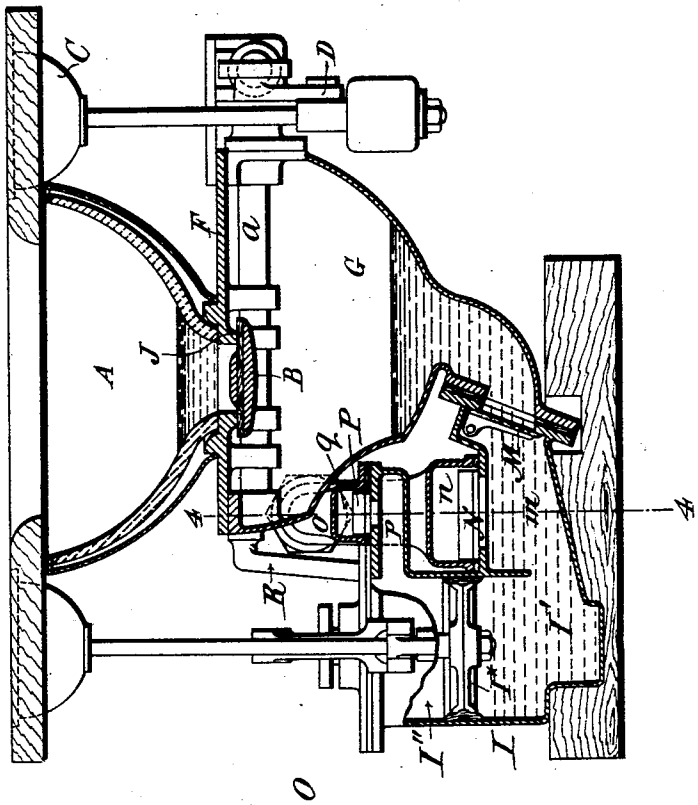
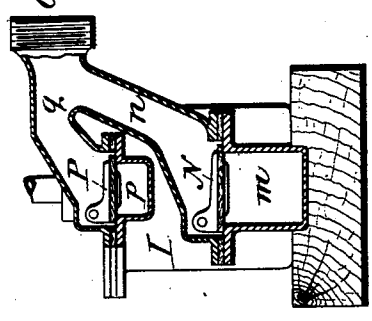


Fig. 4.



WITNESSES:
Fred White
C. K. Fraser.

INVENTOR:
Henry Ives,
By his Attorneys
Wilkinson Fraser & Co.

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

(No Model.)

2 Sheets—Sheet 2.

H. IVES.

SHIP'S WATER CLOSET.

No. 587,735. Patented Aug. 10, 1897.

Fig. 3.

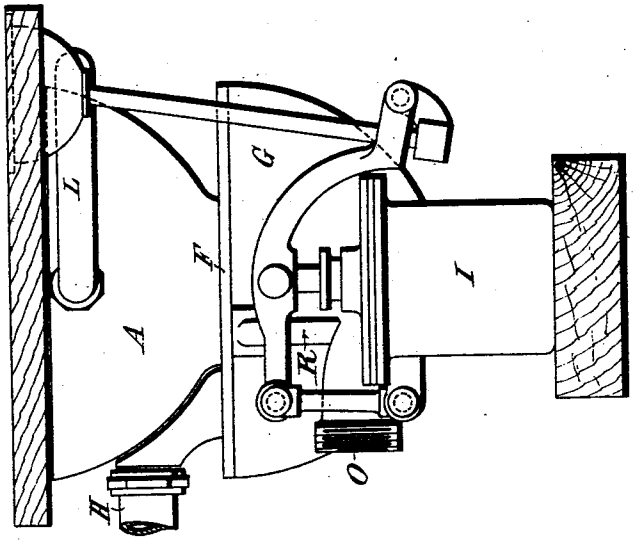
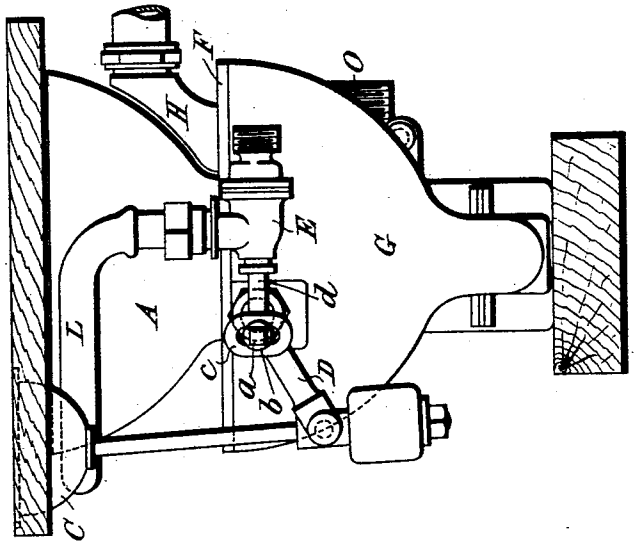


Fig. 2.



WITNESSES:
Fred White
C. K. Fraser.

INVENTOR:
Henry Ives,
By his Attorneys
Arthur C. Fraser & Co.

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

UNITED STATES PATENT OFFICE.

HENRY IVES, OF LONDON, ENGLAND, ASSIGNOR TO THE BLUNDELL'S LONDON COPPER AND BRASS WORKS, LIMITED, OF SAME PLACE.

SHIP'S WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 587,735, dated August 10, 1897.

Application filed July 27, 1896. Serial No. 600,589. (No model.) Patented in England April 30, 1894, No. 8,546.

To all whom it may concern:

Be it known that I, HENRY IVES, of 23 and 25 West India Dock Road, London, England, have invented certain new and useful Improvements in Ships' Water-Closets, (for which I have obtained a patent in Great Britain, No. 8,546, bearing date of April 30, 1894,) of which the following is a specification.

Under-line water-closets, when fitted in the usual way on board ship, are not easy to work, inasmuch as considerable force has to be exerted to operate the pump by which they are emptied. They are therefore not suitable for use by invalids, sick persons, or children.

The object of the present invention is to overcome this objection.

Such closets have heretofore consisted of a bowl or pan closed by a valve, a lateral discharge-pipe leading from this valve, a pump-chamber in the line of this pipe, flushing and discharge pumps, and a separate handle for opening the bowl-valve. With these closets it has been necessary for the user to work the pump at the time of opening the bowl-valve in order to remove the soil from the bowl and to effect flushing of the latter, since the discharge-pipe has not been sufficient to hold the contents of the bowl and the flushing has not been effected by the operation of the bowl-valve. The working of the pump has been necessary with each use of the closet, both because the soil could not entirely leave the bowl without such working, even were the bowl-valve opened, and because the opening of the bowl-valve without operation of the pump has permitted foul air from the discharge-pipe to rise through the bowl and escape as the soil passes from the bowl to the pipe. The force necessary to operate the pump is too great to permit the proper cleansing of such closets by delicate persons using them.

My invention aims to provide an improved closet of this character which can be used several times and the bowl be emptied and flushed each time without operation of the pump, so that the work of operating the pump can be performed periodically by an authorized person and need not necessarily be performed by successive users.

To this end in carrying out the preferred form of my invention I provide a closet having in addition to the usual bowl and bowl-valve and pump a large intermediate lower pan or storage-receptacle of a capacity to receive a plurality of discharges from the bowl, preferably of greater capacity than the latter and having a closed chamber, the upper part of which is provided with an air-vent for the escape of foul odors and the lower part of which is provided with an outlet leading to the chamber of the discharge-pump, which outlet is controlled by one of the pump-valves, it and the pump-chamber being preferably both below the discharge-pipe from the pump, and I provide a pump-chamber which is closed above and below the plunger and has valved outlets from both sides of the latter leading to the discharge-pipe, the lower one between the pump and the soil-storage receptacle for carrying away the soil drawn therefrom into the pump and the other one above the plunger for permitting escape of foul gases from the pump, and I provide a flushing connection for the bowl operated by the means operating the bowl-valve and independently of the soil-pump, so that the emptying of the bowl is accompanied by its flushing and without requiring the exertion necessary to discharging the soil. With this arrangement an under-line ship's closet can be worked in the same way and with the same ease as an ordinary house-closet. The closed lower pan forms a receptacle for the soil of several discharges from the upper pan, and this soil can be pumped overboard from time to time, by a person appointed for the purpose, by means of the usual pump, and the pans can also be thoroughly flushed, so that they are kept clean and sweet.

In the accompanying drawings, Figure 1 is a side elevation, partly in mid-section, of an under-line water-closet constructed in accordance with this invention. Fig. 2 is a front elevation, and Fig. 3 a back elevation, of the same. Fig. 4 is a section on the line 4 4 of Fig. 1.

A is the upper pan or bowl, made preferably of chinaware, carried in a metal casing. This pan is fitted with a valve B, which in the arrangement shown is worked by the han-

dle in the cup C, through the intermediation of the lever D, in a well-known manner—that is to say, the end of the lever D is secured to a spindle *a*, by which the valve B is carried, so that when the lever D is acted upon by the upward movement of the handle in the cup a partial rotation is given to the spindle *a* and the valve B is consequently tilted. The valve B normally retains water in the pan, and when open permits of the discharge of the soil. In the arrangement shown the lever D, in addition to working the valve B, also opens and closes the flushing-valve in E, which is so fitted as when open to give passage to water through the pipe L to flush the pan, and then an afterflush, in the manner well understood, so as to seal the joint at the valve B.

The valve in E is shown as actuated by a cam *b* on the lever D. This cam works in a slotted piece *c* on the end of a rod *d*, to which the valve is connected, so that when the cam *b* moves the rod *d* in the one direction it opens the valve and when it moves the rod *d* in the other direction it closes the valve. A separate cock worked by independent handle may, however, be used for admitting and shutting off the water.

G is the lower large soil-storage pan, preferably made of metal enameled inside. It is hermetically closed by a cover F, which carries the upper pan A, and in which cover the seating J for the valve B is formed.

H is a vent-pipe fitted in the cover F and leading overboard, thus allowing air to escape freely from the lower pan G.

The lower pan receives the soil and water discharged from the upper pan A through the valve B, and these can be pumped overboard from time to time, by a person appointed for the purpose, by means of the usual pump I, and, as has already been stated, the pans can also be thoroughly flushed, so that they are kept clean and sweet.

Referring more particularly to Figs. 1 and 4, M is the pump suction-valve, opening into the pump-passage *m*. N is the pump delivery-valve, opening into the uptake *n* and thence into the pipe O, leading overboard. In the operation of the pump I on the upstroke of the pump-piston I* the soil and water that have accumulated in the lower pan G enter through the suction-valve M into the pump-passage *m* and the lower part I′ of the pump I. On the downstroke of the pump-piston I* the said soil and water are forced out of the lower part I′ of the pump and the passage *m*, past the delivery-valve N, through the uptake *n* and the pipe O, and discharged overboard.

Any soil and water that may have leaked past the piston I* into the upper part I″ of the pump is forced from said upper part at each upstroke of the piston I* out through the passage *p*, past the non-return valve P, and through the passage *q* into the pipe O, and thence overboard; also, any gas or foul air that may leak past the piston I* into the upper part I″ of the pump or may be generated therein is discharged continuously, but more especially on the upstroke of the piston I*, through the vent-pipe R (which leads from the upper part I″ into the upper part of the lower pan G) and from said lower pan G through the vent-pipe H overboard. The pipe R also serves to prevent the formation of a vacuum in the upper part I″ of the pump on the downstroke of the piston I*, which vacuum would render the working of the pump more laborious.

What I claim, and desire to secure by Letters Patent, is—

1. In under-line ships' water-closets, the combination of an upper pan to first receive the soil, a flushing apparatus connected therewith, a lower receptacle of a capacity to hold at one time a plurality of discharges from said upper pan, a valve between said upper pan and said lower receptacle delivering the contents of said upper pan to said lower receptacle, a pump connected with said lower pan for pumping the contents of same overboard from time to time, and means for operating said valve independently of said pump, substantially as and for the purpose set forth.

2. In under-line ships' water-closets, the combination with an upper pan A for first receiving the soil, of the lower receptacle G, the pump I for pumping the contents of said receptacle overboard, said receptacle having a capacity to hold at one time a plurality of discharges from said upper pan A, a flushing apparatus connected with said upper pan, a valve B between said upper pan and said lower receptacle and delivering the contents of said pan to said lower receptacle, and operating independently of said pump, a cover F to said receptacle, and a vent-pipe H fitted to said cover and leading overboard, substantially as and for the purpose described.

3. In ships' water-closets, the combination with a bowl and bowl-valve, of a soil-storage receptacle below the bowl and of a capacity sufficient to receive and hold several discharges therefrom through said valve, means for emptying said receptacle, means for operating said valve, and means for flushing said bowl operated with the operation of said valve, whereby the closet can be used and flushed several times without emptying said receptacle.

4. In ships' closets and the like, the combination with a bowl, of a soil-storage receptacle below the bowl receiving the discharge therefrom, and of a capacity to hold at one time a plurality of discharges from said bowl, of means for emptying said receptacle, means for discharging the soil from the bowl into the receptacle, and means for flushing the bowl operating independently of the emptying of said receptacle.

5. In ships' water-closets and the like, the

combination with a bowl, of a soil-storage receptacle below the bowl receiving the discharge therefrom, and of a capacity sufficient to hold at one time a plurality of discharges from the bowl, means for discharging soil from the bowl into said receptacle, means for flushing the bowl, an air-vent from said receptacle, a pump for emptying the latter having a soil-chamber communicating with the bottom thereof, a valve between said chamber and receptacle, a discharge-pipe from said chamber between said valve and pump, and means for operating said pump independent of the means for flushing the closet.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY IVES.

Witnesses:
JOHN C. MEWBURN,
GEORGE C. BACON.