

(No Model.)

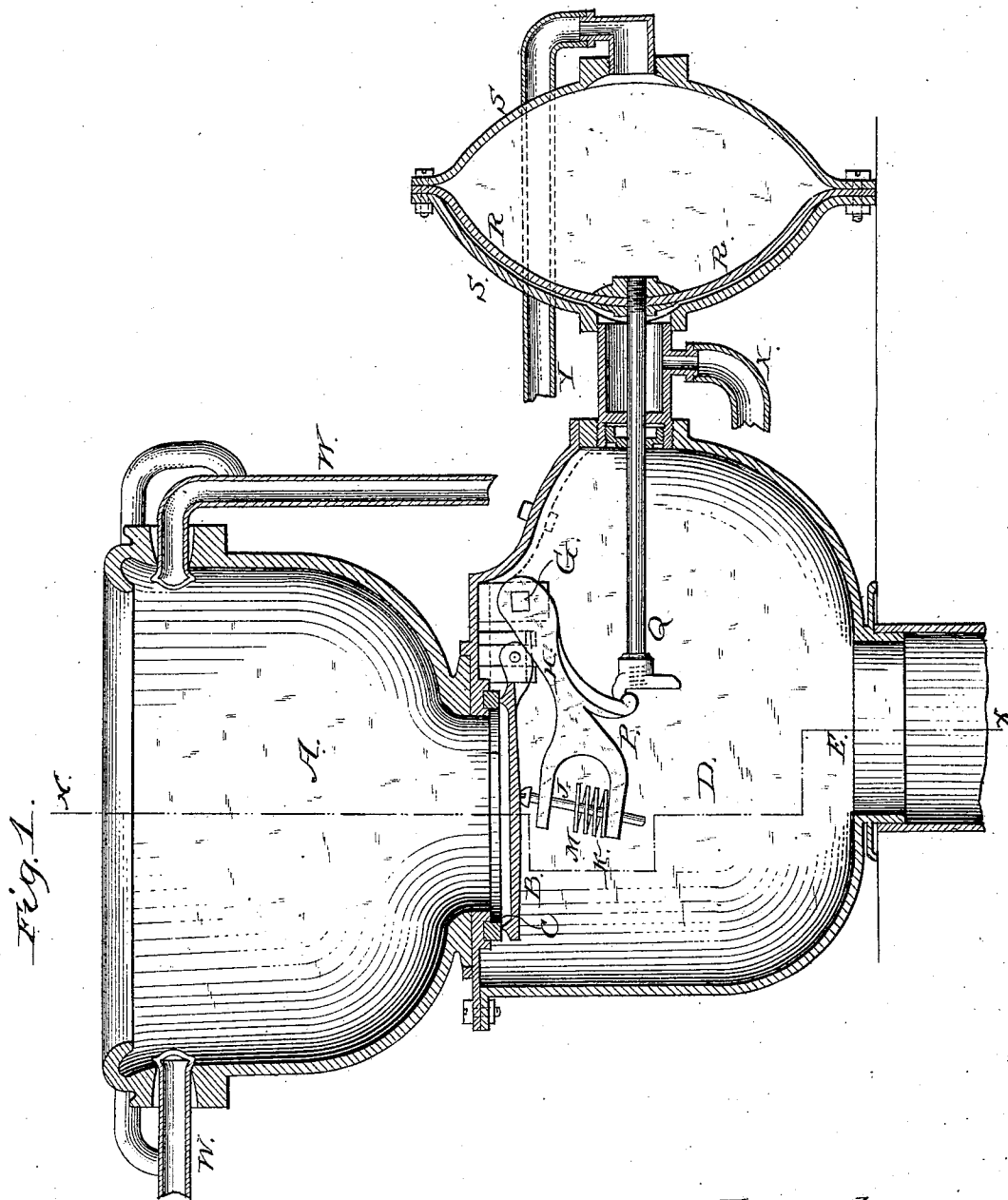
3 Sheets—Sheet 1.

W. M. SACK.

WATER CLOSET.

No. 253,106.

Patented Jan. 31, 1882.



Witnesses;

*Walter Fowler,
Warren Parsons.*

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Fig. 2.

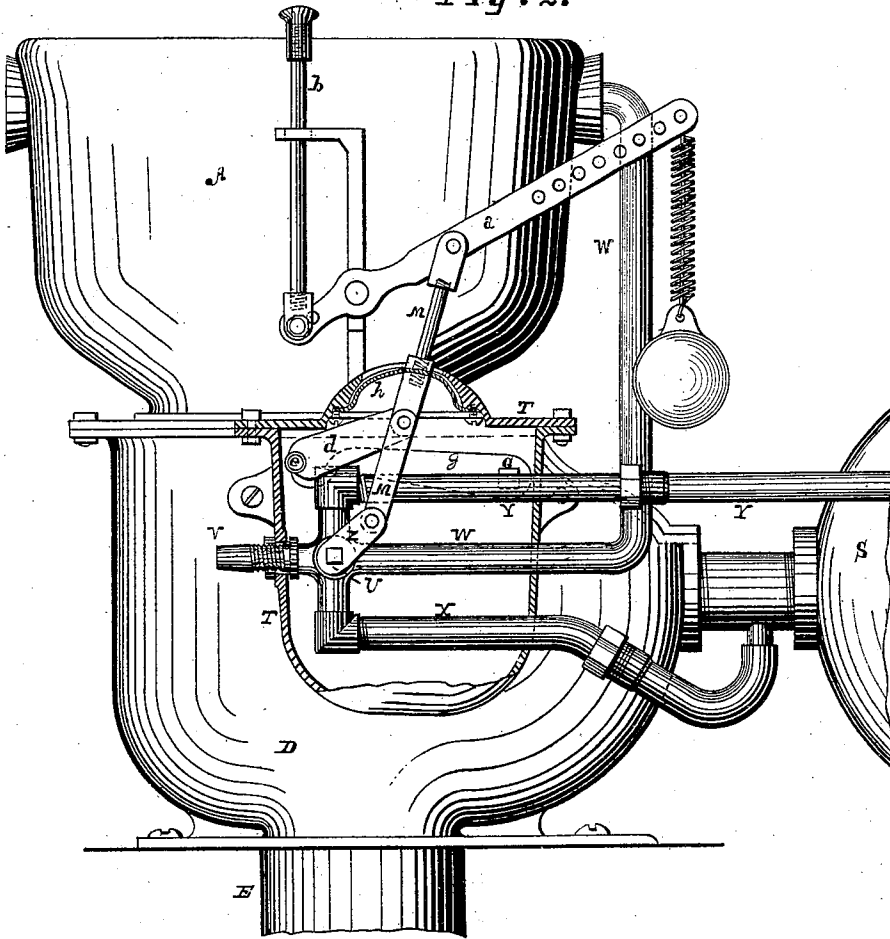
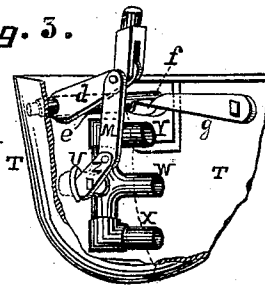


Fig. 3.



Witnesses

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(No Model.)

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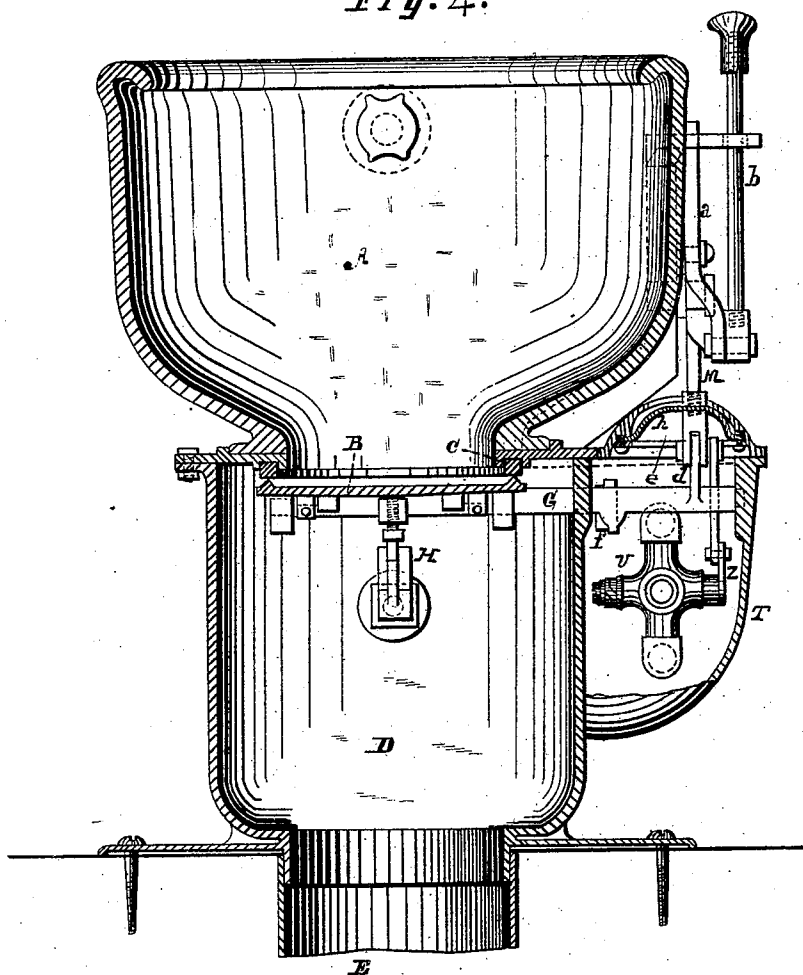
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Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM M. SACK, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
EZRA A. MAY, OF SAME PLACE.

WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 253,106, dated January 31, 1882.

Application filed September 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. SACK, of Oakland, county of Alameda, State of California, have invented an Improved Water-Closet; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in water-closets; and it consists in a novel arrangement of a gate or valve which closes the bottom of the bowl, and is operated by appropriate mechanism to prevent at all times the upward escape of odors or foul air. In combination with this valve I employ a chamber having within it a flexible diaphragm and pipes to admit water to each side of it alternately, so that while one side is being emptied the other will be filled. This diaphragm is connected by a rod and levers with a valve, and a cock is operated by a lever connected with the seat, so that the admission of water upon one side of the diaphragm causes it to move and withdraw the rod and levers so that the valve may be opened at the proper time; but the valve is prevented from opening, while the seat is occupied, by a catch actuated at the same time with the opening of the cock. As the diaphragm moves back it forces a supply of water into the bowl. When the seat is released the cock is turned so as to reverse the flow of water and move the diaphragm back to its first position. At the same time the cock releases the valve and allows it to swing open and discharge the contents of the bowl into the chamber below or soil-pipe, and the return of the diaphragm closes the valve while supplying water to wash the bowl.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of the bowl-valve, diaphragm, and chamber, showing the mechanism for operating the valve. Fig. 2 is a side elevation of the bowl and a section of the water-cock chamber. Fig. 3 is a section of this chamber, showing the levers for operating the cock, and the stop which keeps the valve closed. Fig. 4 is a transverse vertical section of the bowl, taken through X X, Fig. 1.

A is the bowl of my closet. B is a valve, which is hinged at one side, and is made with a flange to close against a suitable packing-

ring, C, below the bowl, and thus make a tight joint. Below this valve is a chamber, D, of considerable size, and connecting with the upper end of the soil or waste pipe E. A horizontal shaft, G, extends across behind the hinge of the valve, turning in suitable boxes; and it has a lever, H, secured to it. The lever H has a forked end beneath the center of the valve, and a pin, J, passes through the two parts, so that its head may act upon the valve and close it. A spring, K, surrounds this pin between the ends of the lever, and presses against a collar, M, secured to the pin, so as to force the pin up to its highest point. As the shaft G rotates in closing the valve B the head of the pin acts to close the valve before the shaft has completed its rotation, and its continued movement forces the lever still farther up and compresses the spring. The lever H has a projection or arm, P, and a rod, Q, which extends from the center of the diaphragm, moves the lever, and thus rotates the shaft G at the same time it closes the valve B. The lever H is fitted upon a square portion of the shaft G, or is keyed or secured to it so as not to slip.

The diaphragm R is circular, and has its edges secured between the flanges of two segments of spheres, S, being so large that it may curve so as to fit the inside of either of them, and as the whole is water-tight it will be seen that if water is introduced through a pipe under pressure upon either side of the diaphragm it will force the diaphragm to travel across to the opposite side, filling the whole space upon that side between the segments, while the diaphragm forcibly ejects any water which may have been contained in the opposite side. As the rod Q is secured by suitable disks to the center of the diaphragm, passing out of the case through a stuffing-box, it will be seen that the movements of the diaphragm will move the rod and its attachments with a force in proportion to the pressure of water and the areas of the diaphragm.

A chamber, T, is formed at one side of the chamber D to contain the cock U, and may have an opening leading into the chamber D to discharge any water which may leak from the cock. The cock U is of the four-way pattern, and receives water from the supply-pipe

V, while it discharges through the pipe W into the bowl.

X Y are pipes leading from the cock to opposite sides of the diaphragm, as shown, and it will be seen that when the cock connects one side of the diaphragm-chamber with the supply-pipe it will connect the other side with the discharge into the bowl. The cock is operated by a lever-arm, Z, which is connected by a link, m, with the lever a. The lever a has a rod, b, extending upward, so that its upper end will be pressed upon when the seat is occupied, and the lever a will thus be pressed down, so as to raise its opposite end and actuate the valve. A weight, c, at its opposite end is made of sufficient size to return the parts to their first position as soon as the seat is released. A lever-arm, d, is secured to a short shaft, e, and has its opposite end attached to the link above the lever Z, so as to be moved simultaneously with it. The shaft e has a lug, f, upon it, and when the lever d is moved up, as before described, it rotates the shaft e, turning the lug f up so as to engage the point of a lever, g, which is secured to the end of the shaft G, projecting into the chamber T. This prevents the shaft G from rotating and allowing the valve B to open as long as the seat is pressed down, although the cock, being open, has admitted water to move the diaphragm back, and thus withdraw its rod, which ordinarily supports or closes the valve. As soon, however, as the seat is released the weight upon the long arm of the lever a returns the levers to their natural position, and by rotating the shaft e back the lug f releases the end of the lever g, and thus allows the shaft G to rotate with its levers, and this permits the valve B to open at once and discharge the contents of the bowl into the chamber D, and thence to the soil-pipe. The reverse movement of the water produced by the change of the cock returns the diaphragm and its rod, thus closing the valve B, as before described.

The operation of flushing the bowl is as follows: When the apparatus is used the rod b is depressed, which operates the cock U through the intermediate mechanism described, and in such manner that a passage or way from pipes V to X and from pipes W to Y is opened, the normal position of the diaphragm R being that shown in Fig. 1. The flow of water then passes from pipe V, to X, to diaphragm, and there being no main pressure behind the same, it forces the water contained in the diaphragm-chamber S out through pipes Y, through cock U, to pipe W, thereby flushing the bowl.

In order to prevent any escape of gas from the chamber D through the chamber T by way

of the connecting rod or link, I employ a loose diaphragm, h, which has its edges secured to the top of the chamber T, and its center is secured to the link, so as to move up and down with it without ever leaving an opening.

By this construction I provide a water-closet having a perfect gas-seal, a double wash for the bowl, and a simple means for operating all the parts.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The valve B, hinged so as to close against the bottom of the bowl A, in combination with the lever H, mounted upon a shaft, G, and connected with the valve, the acting diaphragm R, and the rod Q, substantially as and for the purpose herein described.

2. The forked lever H, secured to the rotating shaft G, and having the pin J sliding through its two fork ends, in combination with the spring K, so that after the pin has closed the valve B the compression of the spring will allow the shaft to continue its rotation, substantially as and for the purpose herein described.

3. The diaphragm R, having its edges secured between the convex cases S, and the rod Q extending from its center to operate the lever H, as shown, in combination with the water-pipes opening into the cases upon each side of the diaphragm, so that water under pressure may be admitted to force the diaphragm to one side or the other of the case and move or release the lever and valve, substantially as herein described.

4. The diaphragm R, moving within the double-convex case S and operating the rod Q, in combination with the four-way cock U, the supply and discharge pipes V W, and the pipes X Y, leading to opposite sides of the case S, substantially as and for the purpose herein described.

5. The diaphragm R, moving in the case S, with its rod Q, the four-way cock U, and the connecting-pipes, the operating-levers Z a, and connecting-rods, in combination with the shaft e, lever-arm d, and the lug f, which are operated therefrom and made to engage a lever, g, upon the shaft G, so as to prevent the rotation of the latter until released, substantially as herein described.

In witness whereof I have hereunto set my hand.

WILLIAM M. SACK.

Witnesses:

S. H. NOURSE,
J. H. BLOOD.