

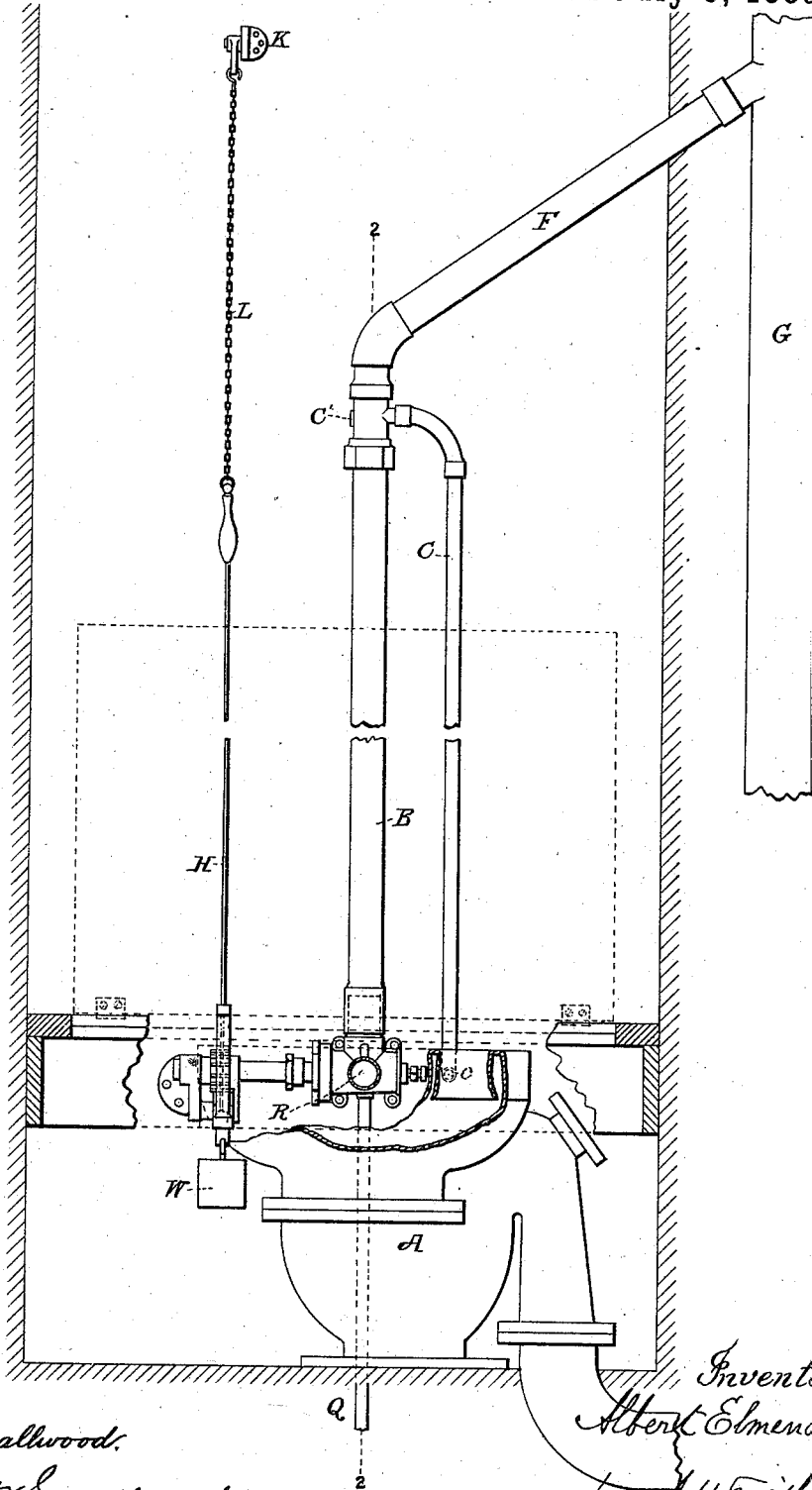
A. ELMENDORF.

WATER CLOSET.

No. 385,409.

Patented July 3, 1888.

FIG. 1.



Attest.
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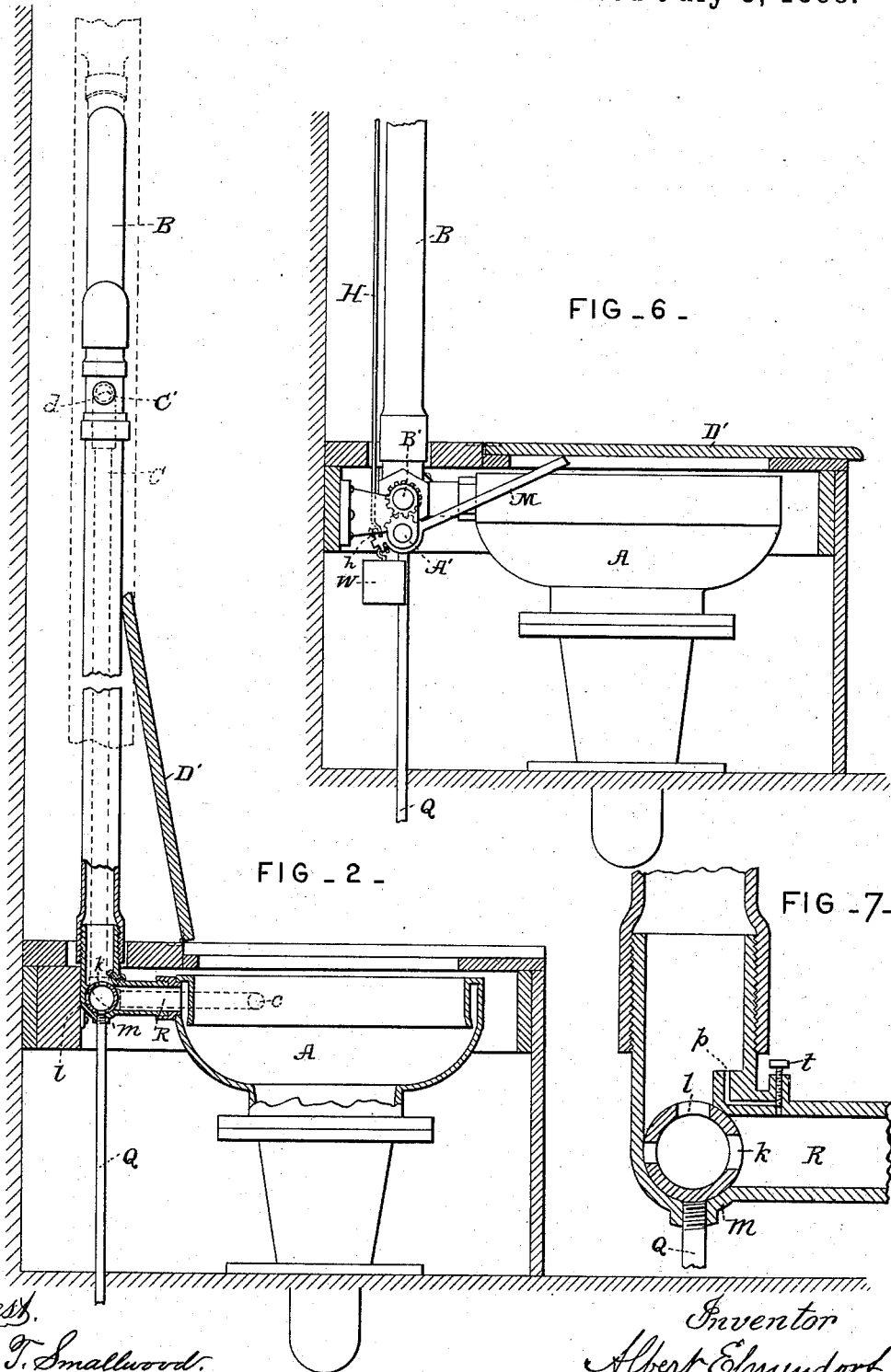
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FIG. 3.

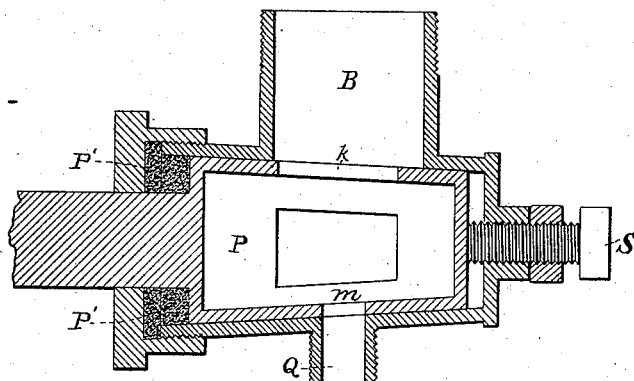


FIG. 4.

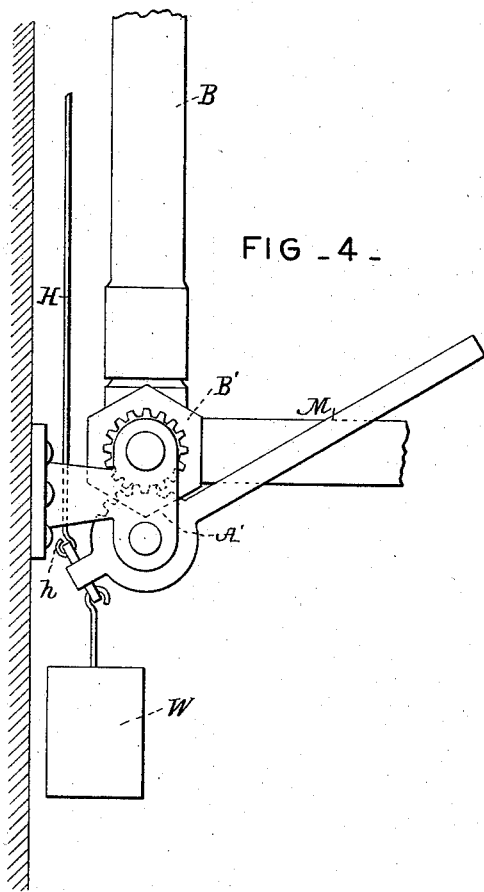
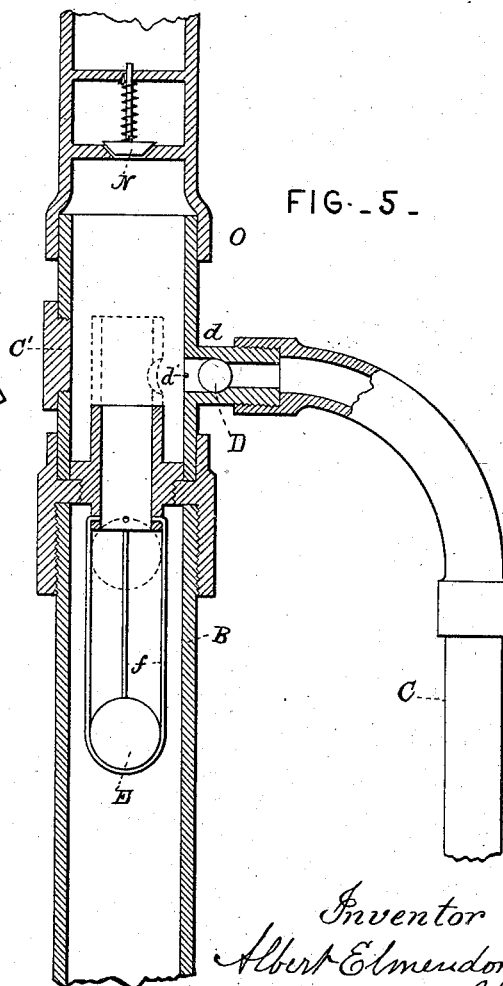


FIG. 5.



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UNITED STATES PATENT OFFICE.

ALBERT ELMENDORF, OF NEW LONDON, CONNECTICUT, ASSIGNOR OF ONE-HALF TO STEPHEN A. GARDNER AND CHARLES PRENTIS, BOTH OF SAME PLACE.

WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 385,409, dated July 3, 1888.

Application filed May 12, 1888. Serial No. 273,650. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ELMENDORF, of New London, county of New London, and State of Connecticut, have invented a new and useful Improvement in Water-Closets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

The object of my invention is to ventilate the air-space in the bowl through a pipe connecting at one end with the bowl and at the other with a stand-pipe, to be filled with water for flushing said bowl. This stand-pipe is to take the place of the tank or reservoir, usually located several feet above the closet-seat.

The invention consists in the combination, to be hereinafter described and claimed, of a three-way cock and certain valves in such relation to each other, the stand-pipe, and the ventilating-pipe that the falling of the column of water in flushing the bowl will draw after it the foul air or gas, and the refilling of the stand-pipe with water will force the same out through a pipe-connection to the soil-pipe, roof, or chimney.

In the accompanying drawings, Figure 1 is an elevation of the devices for flushing the bowl, the latter being partly broken away to show where the water enters. Fig. 2 is a vertical section of the bowl and seat and lower part of stand-pipe. Fig. 3 is a cross-section of the three-way cock; Fig. 4, a detailed view of the weighted lever for operating the cock; Fig. 5, a vertical section of the stand-pipe through the lines 2 2 of Fig. 1. Fig. 6 is a perspective view of the bowl, the lower part of the stand-pipe, and the operating-lever, the end of the case inclosing the bowl being removed; Fig. 7, a section of three-way cock and drip-pipe.

In the drawings, A denotes the bowl or basin of the closet.

B is the stand-pipe, which fills with water to a certain height, and is then emptied to flush the bowl.

C is the ventilating-pipe.

B is the open end communicating with the air-space above the water in the bowl; *d*, the end which enters the stand-pipe C.

D is a ball-valve between stand-pipe and ventilating-pipe.

E is a float-valve at the top of the stand-pipe B.

F is a portion of the stand-pipe, forming a ventilating-extension thereof, which enters a soil-pipe, G, or passes into a chimney-flue or out upon the roof.

H is a pull-rod connected with a bell-crank, K, at a point above the top of the stand-pipe; L, a chain furnished with a handle for operating the pull-rod; *h*, the end of the pull-rod connected with the short end of a weighted lever for operating a three-way cock.

M is the long arm of the lever to operate the three-way cock.

N is a weighted valve above the float-valve in the stand-pipe.

O is a slip-joint, of any well-known form preferred, to enable the workman to open the stand-pipe and get at the valves. This slip-joint may be located directly at the float-valve E.

P is a three-way cock, which opens into the stand-pipe, into the service-pipe Q, and into a short pipe for flushing the bowl.

W is the weight for operating the three-way cock through the cog-teeth A' and tooth-wheel B'.

C' is a screw-cap for permitting access to the ball-valve D in the ventilating-pipe.

f f is the wire cage to contain the float-valve E.

D' is the cover of the closet-seat, which holds down the arm M when closed.

k, *l*, and *m* are the three openings in the three-way cock P.

R is the short pipe through which the column of water in the stand-pipe flows in flushing the bowl.

In Fig. 7, *p p* is a drip-pipe to keep the bowl moistened, and *t* is the set-screw for regulating its flowing capacity.

In Fig. 3, S is a set-screw holding the three-way cock in position. P' is the packing around the three-way cock.

In Fig. 1 will be seen the ventilating-pipe C, with one end entering the upper part of the bowl and the other the stand-pipe. In the upper part of this pipe C is a ball-valve, D,

which, when the column of water is falling in flushing the bowl, is drawn inward from its seat, allowing the air to be carried from the pipe C into the stand-pipe. Now, it naturally follows that the water, being admitted again to the stand-pipe B, drives before it the foul air or gas, which cannot escape again into the ventilating-pipe C, as the pressure of the column of air closes at once the ball-valve D, which cannot open again until the falling of the water draws it, so to speak, or allows it to come in toward the interior of the stand-pipe. As the foul air or gas must be driven before the rising column of water and cannot pass back into the pipe C, it is driven forward into the upper part of the pipe F, which may either connect with the soil-pipe, a flue of the chimney, or the open air through the roof of the building.

In Fig. 5, Sheet 2, is shown a float-valve, E, dropped to its lowest position immediately following the escape of the column of water into the bowl in flushing. As the column of water again rises upon the proper manipulation of the three-way cock, as hereinafter described, it carries up the valve E until it reaches the position shown in dotted lines, thus closing the end of the stand-pipe and preventing the entering of any more water.

In Fig. 4, Sheet 2, is seen the weighted lever for operating the three-way cock to allow water to enter the pipe or to leave the same, or to enter into and flush the bowl.

In Fig. 7 is shown the three-way cock so turned as to prevent any more water from entering from the service-pipe Q and to allow the escape of what is in the stand-pipe through the short pipe R, which enters the bowl. The position shown in Fig. 7 is the one the three-way cock assumes when, after use of the closet, the heavy lid is turned down upon the lever M, (seen in Fig. 6 of Sheet 3,) or when the chain L of Fig. 1, Sheet 1, is pulled down and the rod H moved (through the bell-crank K) so as to lift the weight W, attached to the short end of the lever.

The three-way cock is shown in Fig. 2 of Sheet 3 as turned back by the weighted arm of the lever, so that the water enters the stand-pipe B through the service-pipe Q, and will continue to do so until the float-valve E reaches its seat in the upper end of the stand-pipe. The pipe is thus always filled normally and only emptied when the lid of the seat is forced down or the pull-rod H manipulated.

In Fig. 7 will be seen a small drip pipe or opening in the side of the case of the three-way cock to allow a small quantity of water to enter and moisten the bowl while the closet is being used and before the bowl is flushed. The capacity of this drip-pipe *p p* is regulated by a set-screw, *t*. The three-way cock in this figure is turned for flushing, while in Fig. 2 of Sheet 3 it is turned to allow the stand-pipe to fill. The three openings of the three-way cock are seen in Fig. 8, Sheet 2, and in Fig. 2, Sheet 3, and are lettered *k l m*. In Fig. 5, Sheet 2,

will be seen the valve N, which is really not necessary. It opens to admit the foul air or sewer-gas driven before the rising column of water in the stand-pipe. A strong current of air blowing down the flue or pipe will close this valve, and thus prevent the air or gas from entering the room; but ordinarily the valve D will be sufficient for this purpose. C', same figure, is a screw-cap to permit access to the valve-seat of the valve D. At or about this point any one of the well-known forms of slip-joint (too well known to need description) is used or may be to permit ready access to the float-valve. This slip-joint is seen in Fig. 1, Sheet 1, at O, and is there located directly above the valve.

In Fig. 3 of Sheet 2 will be seen in cross-section the three-way cock so turned that access is given to the water from the service-pipe until it closes the float-valve.

The small drip-pipe *p* in Fig. 7 may be located entirely within the three-way-cock case, and its capacity adjusted therein by a set-screw the same as is shown upon the outside.

From what has already been said the operation of the device will be readily understood. When the closet is not in use, the three-way cock is turned by the weight W, so that water stands in the pipe B up to the float-valve, which would then rest as seen in dotted lines in Fig. 5, Sheet 2. Now, as soon as the closet has been used, the pull-rod H on the lever-arm M is manipulated by the weighted lid of the seat, so as to turn the cock and open into the bowl, as seen in Fig. 7. As this column of water falls it draws the air past the valve D, which it opens, allowing the gas or foul air to come up through the pipe C from the air-space of the bowl. Immediately upon the weight turning the cock the water passing in forces this same foul air or gas along before it (closing the valve D, of course) and out into the soil-pipe G or other exit.

It has been ascertained by careful experiments in Germany that with the best of traps in use there is always a slow but constant passage of gas through the water of the trap. Gas is found almost constantly to be present in small quantities in the bowl.

The present device at each and every use of the closet draws away this foul air and then forces it out at some elevated spot, where it will not be prejudicial. It can of course be readily arranged to operate the three-way cock in many different ways. A small flock of cotton or wool placed within the pipe C, which was made of glass, readily demonstrated that the moment the water commences to fall in flushing the said flock rises to near the ball-valve D.

The extreme simplicity of this device renders a more elaborate description unnecessary. Actual experiments have demonstrated the action of the parts, as hereinbefore set forth. The ball-valve may be held against displacement by a rod, *d'*, or other suitable means at the mouth of pipe C.

What I claim as new and of my invention is—

1. In a water-closet, the combination of a flushing stand-pipe connected to the service-pipe and a ventilating-extension thereof, with a ventilating-pipe opening at its upper end into the stand-pipe and at its lower end into the air-space of the bowl, and a valve at its upper end opening inward toward said stand-pipe, all as and for the purpose described.

2. In a water-closet, the combination of a flushing stand-pipe connected to the service-pipe by a three-way cock, and a ventilating-extension of said pipe, with a ventilating-pipe provided with a valve opening into its upper end and at its lower end into the air-space of the bowl, and with a float-valve at the upper end of the stand-pipe to cut off the flow of water when said pipe is full, all as and for the purpose set forth.

3. In a water-closet, the combination of a flushing stand-pipe with a ventilating-pipe connecting the air-space of the bowl with said stand-pipe, and of the floating valve at the upper end of the stand-pipe to cut off the flow of water, a valve in the stand-pipe above its connection with the ventilating-pipe opening upward and adapted to be closed by a current flowing down the pipe from the flue or roof-pipe, and a valve in said ventilating-pipe, all as and for the purpose set forth.

4. In a water-closet, the combination of the following elements, viz: a flushing stand-pipe, a three-way cock connecting its lower end with the service-pipe, a float-valve at its upper end to cut off the flow of the water, a ventilating-extension of said pipe, a ventilating-pipe entering the stand-pipe above the float-valve and opening at its lower end into the bowl, and a valve above the connection of the stand-pipe and its ventilating-extension to prevent undue air-pressure from above, all as and for the purpose set forth and described.

5. The combination of a flushing stand-pipe, a ventilating-extension thereof, a ventilating-pipe connecting the stand-pipe with the bowl, and the valves, all as set forth, with the three-way cock at base of stand-pipe, with its openings arranged, as set forth, for filling the stand-pipe while in one position and flushing the bowl when turned to another, and with the small drip orifice or pipe in the three-way-cock case to permit a slight flow of water to moisten the bowl while it is in use and before the cock is opened for flushing, all as and for the purpose described.

6. The combination of the stand-pipe with its valves, the ventilating-extension thereof, the ventilating-pipe connecting said pipe with the bowl and provided with its openings and valves, as set forth, the three-way cock, located as described, with the drip-pipe in its case, and a set-screw for regulating the amount of flow of water through the same for moistening the bowl, all as and for the purpose set forth.

7. In a water-closet, the combination of the following elements, viz: the stand-pipe, the three-way cock located at the lower end of the same, the ventilating-pipe and valves connected, as described, with the stand-pipe and the bowl, a ventilation-extension of the stand-pipe, and the valves and slip-joint located at the junction of the stand-pipe, its ventilating-extension, and the bowl-ventilating pipe, all substantially as described.

In testimony whereof I have hereunto set my hand this 7th day of May, A. D. 1888.

ALBERT ELMENDORF.

Witnesses:

CHARLES PRENTIS,
JOHN C. GEARY.