Sept. 14, 1948. C. J. MAJAUSKAS 2,449,134

VENTILATING AND FLUSHING APPARATUS FOR WATER CLOSETS

Filed March 7, 1947

Fig-1

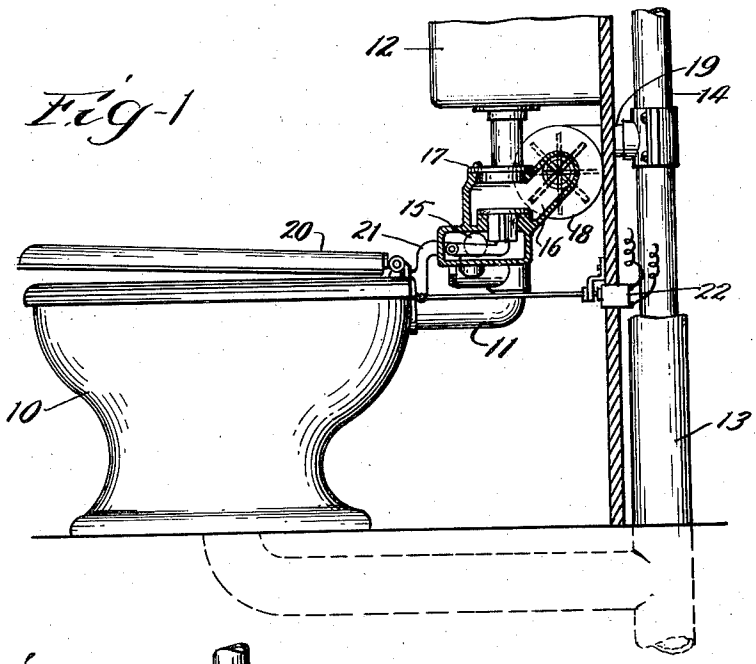


Fig-2

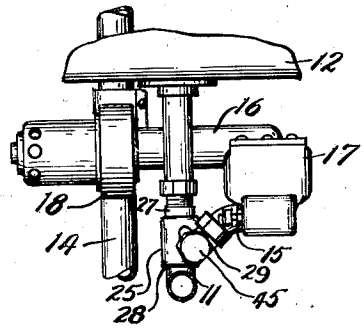


Fig-4

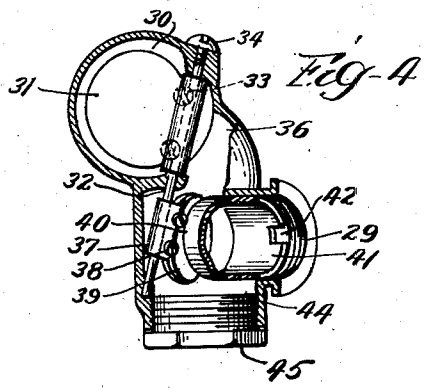
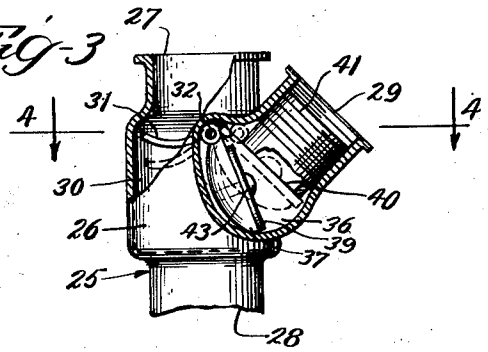


Fig-3



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2,449,134

VENTILATING AND FLUSHING APPARATUS FOR WATER CLOSETS

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Application March 7, 1947, Serial No. 733,024

1 Claim. (Cl. 4—213)

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My invention relates to ventilating and flushing apparatus for water closets, and is an improvement on the apparatus disclosed in my Patent No. 1,734,498, issued November 5, 1929.

I have discovered that it is particularly advantageous to provide a water control valve in such a system which will at all times prevent the flush water from backing up through the exhaust fan; and I have invented a valve for accomplishing this purpose which is simple in operation and so constructed that little maintenance is required to keep it in proper operating condition.

In addition to the foregoing, other objects and advantages of my invention include the following: to close the air exhaust line at the time when the rush of water through the pipe from the tank to the bowl is sufficiently strong so that without such closure the water would back up through the air exhaust line to the fan and vent, to open the valve when only a small quantity of water, or none at all, is passing through said line, thereby allowing the fan to draw air from the bowl to be discharged into the vent pipe; and to provide a valve seat construction of such a type that proper seating may be obtained despite any deviations in thickness that may be found between various valve facings employed.

Other objects and advantages will become apparent from a study of the following specification and the accompanying drawing, in which:

Fig. 1 is a side elevational view of a preferred form of my invention, with a section of the sewer gas valve cut away to illustrate the interior thereof;

Fig. 2 is a front elevational view of the same installation, showing the component parts of the ventilating system and the relation of the water control valve to such other parts;

Fig. 3 is a front elevational view of the water control valve, with portions broken away to show the interior of said valve; and

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

In accordance with the requirements of R. S. 4888 the following is a description of the preferred form of my invention and the principle of operation thereof, but it should be understood that the appended claims should not be limited by the specific disclosure except as may be required by the prior art.

This invention is for use with a water closet installation consisting of a bowl 10, which is supplied with flush water through a pipe 11 from any convenient source of supply, such as a storage tank 12, all as shown in Fig. 1. In a typical

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installation the water closet will discharge into a waste pipe 13, and is preferably vented through a separate vent pipe 14 which is open to the atmosphere outside the building.

By connecting the suction side of a centrifugal ventilator to the flush water line 11, and the discharge from such ventilator into vent pipe 14, air may be drawn from the bowl 10 and discharged outside the building without the necessity of any special changes in standard plumbing fixtures. This is done by having an air passage from pipe 11 connect with valve 17 at the opening of the air exhaust connection 15 therein. A further passage 16 connects the valve 17 with the intake side of the exhaust fan 18, which fan discharges into the vent 14 through a connecting pipe 19. The normal position of the valve 17 (at such time as the ventilator is not operating) is closed, as illustrated in Fig. 1, to prevent sewer gas from vent 14 from backing up and out of the bowl through these connections.

The water closet seat 20 is spring-loaded so as to normally position it above the water closet bowl. Pressure on this seat sufficient to depress it rotates a lever 21 to open valve 17 and at the same time to operate an electric switch 22 and energize the motor driving the fan 18. This fan will proceed to draw air from bowl 10 through pipe 11 and the connections thereto, discharging into vent pipe 14. The water supply valve, which in the illustrated system will be found in tank 12 at the entrance to pipe 11, will effectively seal that end of pipe 11 forcing the air to be drawn from the water closet bowl.

However, I discovered that in the event the flush water were discharged through pipe 11 at such time as valve 17 was open, there would often be sufficient head of water to cause the water to back up through the connection with pipe 11 to valve 17, and thence into the fan. In many instances this would result in damage to the fan blades, and loss of water by discharge into the vent 14. To remedy this situation I have invented a special valve 25 to be inserted in the connection between the flush water pipe 11 and valve 17, as shown in Fig. 2.

Referring to Fig. 3, the body 26 of valve 25 has an opening therein at 27 to receive the pipe from the flush water supply. A second opening 28 connects with the portion of pipe 11 leading to the water closet bowl. A third opening 29 is for receiving the air exhaust connection 15 of valve 17, as shown in Fig. 2.

Between openings 27 and 28 in the valve body is a flush water passage 30 within which is a lever

31. This lever is mounted on a shaft 32 and is attached thereto, as by means of screws 33 (Fig. 4). The shaft 32 is journaled in the valve body 26 to allow free rotation thereof. The opening in the valve body through which the shaft 32 is inserted is sealed by a cover screw 34 after the shaft is in place.

Within the valve body an air passage 36 leads from the water passage 30 to the air connection 29, and within this air passage is positioned a valve closure 37, the latter being also fastened to shaft 32, as by means of screws 38. The valve closure 37 is adapted to cooperate with a valve seat 40. It has been found to be desirable to employ a valve facing 39 on the upper face of valve closure 37 to insure a positive operation of this valve.

Because of the fact that with normal production practices there will be variations in the fit of the pivoted valve closure and the cooperating valve seat, and because valve facings used for replacement purposes will not always be of the same thickness, provision is made for transverse adjustment of the valve seat. Thus after assembly of the valve in the shop, or after a valve facing has been replaced in the field, the valve seat and the facing on the valve closure may be made to meet in a common plane with the result that a water-tight fit is obtained. This is done by making the valve seat, per se, one end of a tubular member 41 that is threaded into the passageway 29. Rotation of this tubular member 41 may be obtained by engaging it with a screw driver or a spanner wrench in a pair of opposed notches in the end thereof, one of these notches being shown at 42 in Fig. 4.

Valve closure 37 has sufficient weight attached to the under portion thereof, as seen in Fig. 3, that the normal position of this closure will be down, leaving the air passage open. Lever 31 is positioned on shaft 32 in such a manner that when the valve closure is in a downwardly position the lever will be substantially horizontal. In this position the relatively broad face of the lever will substantially obstruct the water passage 30, as is illustrated in Fig. 4.

The following is a brief summary of the operation of this valve. With no water passing through the passage 30 the valve will remain in the open position, and at any time the mechanical blower is operated air can be drawn from the bowl through this valve. When the flush water is discharged into passage 30, the force of such water will press down against the upper face of the lever 31, and, by overcoming the normal force exerted by gravity on the valve closure, will result in a rotation of shaft 32 to bring the valve facing 39 of closure 37 into engagement with valve seat 40, thus effectively sealing the air passage 29. This position of the valve is shown in dotted lines in Fig. 3.

When substantially all of the flush water has passed the valve, and there is no longer sufficient

head of water to cause any backing up, the pressure of the water on lever 31 will have lessened to such an extent that the weight of valve closure 37 will operate to rotate shaft 32, despite the fact that the blower may still be on, and again open the air passage. Thus it can be seen that the action of this valve will be such that the valve will close only when the head of moving water above it is sufficient to otherwise cause a backing up of the water through the ventilating fan. When this danger is not present, the valve will be open, though if a small amount of water is still flowing such opening may be restricted.

The valve facing is retained on the valve closure by any well known means, such as a bolt or expansion pin 43, as shown in Fig. 3. It may be that the valve facing will have to be examined as to condition from time to time, and I have, therefore, provided an opening 44 closed by a nut 45. Through this opening access may be had to inspect the valve facings, when this is thought necessary. This opening and the access obtained therethrough will also aid in the replacing of valve facings.

I claim as my invention:

For use with a water closet having a seat hinged thereto, a pipe connecting said water closet with a source of supply of flush water, said pipe being normally closed at one end by the flush water control valve and open into the closet bowl at the other end thereof, an air passage connecting said pipe and a waste vent, a mechanical blower in said air passage to draw gases from said bowl and discharge the same into said vent, said blower being operated during such time as pressure is applied to the seat of said water closet, a valve in said passage to restrict the flow of gas through said passage during the time said blower is not in operation, a second valve in said passage adjacent to said pipe, said second valve being normally open, and a pivoted lever in said pipe operatively connected to said second valve, said lever being substantially smaller than the internal diameter of said pipe and being positioned to only partially obstruct the flow of water through said pipe whereby only a flow of water through said pipe sufficient to substantially fill said pipe will actuate said pivoted lever and close said second valve.

CHARLES J. MAJAUSKAS.

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The following references are of record in the file of this patent:

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