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PLUMBING FIXTURE

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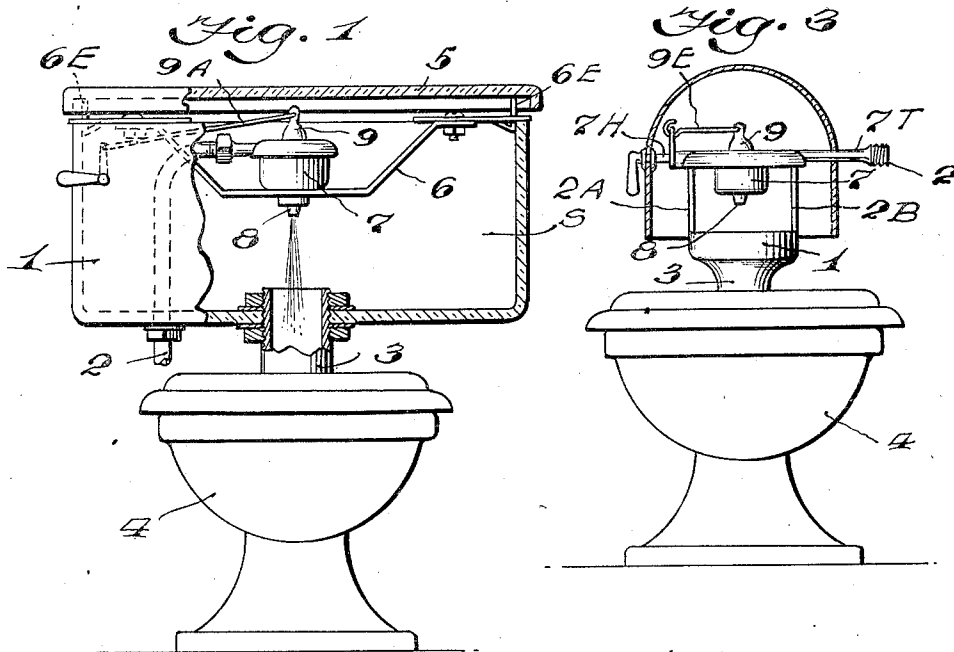
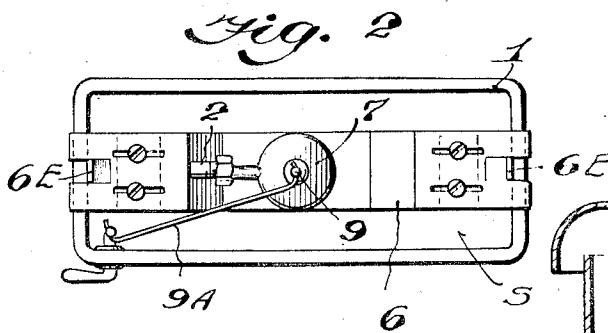
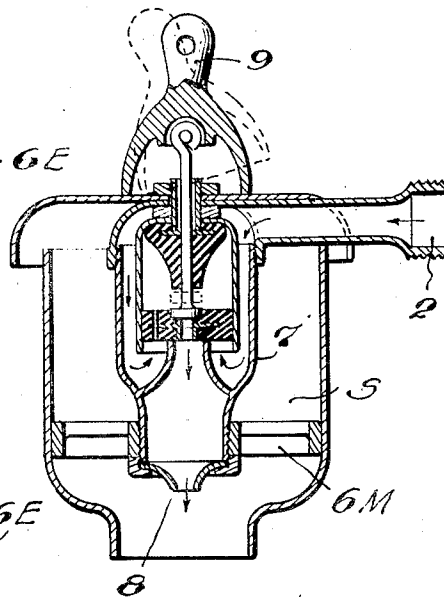
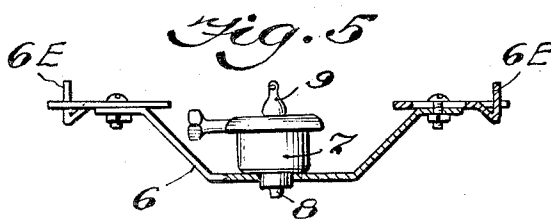


Fig. 4



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PLUMBING FIXTURE

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2 Claims. (Cl. 4—70)

The present invention relates to plumbing fixtures, particularly to a special form of toilet valve equipment for connection to a toilet stool. This invention comprises a new and novel, as well as a convenient and beneficial means of attaching a flushing valve and tank combined in a new manner to change the appearance and the physical and mechanical operation of the valve to work in a different manner. Also existing toilet tank equipment may be changed over from gravity to gravity plus velocity, or in other words to a straight and direct flush valve, without removing the tank or changing the plumbing supply pipes, in many instances.

This application is a continuation-in-part of Serial No. 389,436, filed April 19, 1941.

The primary object of this invention is to eliminate a cross connection or any possibility of establishing same between a flushing fixture and a source of supply contamination.

Another object is to provide a bracket for a pressure operated valve in combination with a tank having an outlet of ample dimensions to permit a flushing valve to project a jet of liquid into the outlet of said tank from such a height with relation to said outlet that ample air space is established between the outlet of the valve and the outlet of the tank to eliminate any possible cross connection between a sewer-connected sewage flushing device and the valve.

Another object is to provide a nozzle to increase the velocity of water flowing from a flushing valve and project a jet stream of liquid into the outlet of a tank within which the valve is disposed, forming a combination whereby ample and unrestricted communication with atmosphere is permitted between the end of said nozzle and said tank and outlet, to prevent any possibility of a cross connection between the tank outlet and the valve.

A still further object is to create a combination comprising a valve, a tank and a sewer-connected toilet bowl or sewage-disposal device having ample air space between the valve and the bowl, the height of the top of the bowl arranged in such relationship that the various elements of the combination serve to eliminate any possible cross connection between the valve and sewer and give maximum efficiency to the inspiring effect of a flushing jet of liquid from the valve entering the outlet of said tank connected with the bowl.

Other and further objects and purposes will appear as the specification proceeds as illustrated by the drawing. The reduction to practice shown

is used for the purpose of illustration only; therefore the applicant is not restricted to that which is illustrated.

Of the drawing:

Fig. 1 shows a diagram of a toilet bowl and flushing tank partly cut away in section showing the relationship of the various elements constituting the invention.

Fig. 2 shows a view of the top of the tank with the cover removed.

Fig. 3 shows a modification of the form of tank ordinarily used, especially for the combination shown.

Fig. 4 is a copy of Fig. 2 taken from the drawing of the application of which this is a continuation in part.

Fig. 5 is a detail of bracket 6.

Like figures and characters indicate like parts throughout the drawing.

1 is a tank having an inlet supply 2, an outlet 3 being connected to toilet bowl 4 which in turn is connected to sewer outlet not shown. The tank 1 has a cover or cap 5 which is held and spaced from the top of the tank 1 by the two ends of bracket 6 which is attached to a flushing valve 7 and has a nozzle 8 projecting concentrically toward outlet 3. The valve 7 has an operating handle 9 attached to the same by means of a link 9A, whereby the valve 7 is opened and the nozzle 8 projects a liquid jet into the outlet 3 at maximum velocity at any given pressure eliminating any frictional contact between the outer wall of outlet 3 and the jet from nozzle 8.

Ample space is provided between the end of nozzle 8 and the opening of outlet 3 to prevent liquid from rising in the tank 1 in case the bowl outlet were stopped; as sufficient liquid would be projected by the nozzle to fill the outlet 3 and the bowl 4 faster than the liquid could escape from the bowl 4. It will be noted that the rim of the bowl 4 is well below the level of the tank and the valve, therefore any stoppage to the outlet of the bowl 4 will cause liquid to overflow the rim of the same prior to the time any liquid might start to rise thru the outlet 3 into tank 1 and establish a cross connection. Presuming that the liquid were to overflow the upper rim of the bowl 4 but not fast enough to prevent a rise into the tank 1 and the liquid rose high enough to contact the nozzle 8, the evacuation of the tank 1 would in any event take place so rapidly, during the interim between pressure and vacuum, that no possible change from pressure to vacuum in valve 7 could cause a cross connection or backflow of liquid thru the valve 7 and into

any supply line connected to valve inlet 2. Therefore no cross connection could be established at any time between the valve 7 and the tank 1 when it were possible for a vacuum to occur.

In Fig. 3 it will be noted that the valve 7 is shown suspended in the tank 1 by the connections 2A and 2B as well as adjustable bracket 6 which leaves ample space S for atmospheric pressure to be present at all times in the tank 1 when the size of the nozzle 8 is considered with relation to the size of the air space S.

In Fig. 3 a special form of tank or casing is illustrated wherein the valve 7 has the nozzle 8 suspended entirely above the rim of tank 1, so that any liquid rising above the top of the casing 1 would overflow same, making impossible a cross connection between the tank 1 and the valve 7 under any circumstances whatsoever.

It is apparent that any restricted air opening in lieu of the ample air space provided by the invention with relation to the outlet 8 and the outlet 3, would prevent the free egress of liquid from the tank 1, and by the same token, in event of vacuum, such unrestricted air inlets would allow sufficient sub-atmospheric pressure to be established in the tank 1 to cause the backflow of liquid thru the valve 7 into the supply line attached to inlet 2. Furthermore the inspirator effect of a jet from nozzle 8 would be nullified to an extent commensurate with the restrictions formed by insufficient air inlet area.

Fig. 4 illustrates substantially as amply a proportionated combination of elements as that shown by Fig. 1, insofar as any possible physical effect is concerned during the operation of the device.

In Fig. 5 the bracket 6 is shown to have up-turned ends 6E adjustably attached to the central suspending portion of the bracket 6. The up-turned portions of the ends 6E serve to space the cover 5 from the tank 1 in Fig. 1 to permit ample atmospheric pressure to obtain in the tank. The same purpose as that served by the bracket 6 of Figs. 1 and 5 is served by the handle cowl 7H and the tail-piece 7T of valve 7 Fig. 4, which suspends the valve 7 in operative position.

Due to the fact that much less liquid is required to use a flush valve 7 when connected as shown rather than in the ordinary manner direct to the toilet bowl 4—without the use of tank 1—it is possible to use a regulation flush valve in many instances, in place of the ball-cock ordinarily used in a tank, without the necessity of changing the supply conditions or other plumbing than

the valve itself by using the combination illustrated and described herein.

It will be noted that the nozzle of the valve 7 projects a jet stream of liquid at a maximum conditional velocity free of friction from any surrounding walls, the velocity of liquid movement only being effected by impact or deflection when entering the bowl 4. Therefore the liquid is moving at the highest possible velocity to do the most effective work. The conditions effecting the velocity of liquid being the form or size of the bowl or sewage-disposal or flushing device 4. Thus the tendency of the invention is to reduce friction to the minimum and sweep out the bowl 4 clean of its contents, by the velocity rather than the volume flow of liquid so that less volume and quantity of liquid is required when using the present invention.

Having described my invention and the operation thereof, as well as the new and novel construction and results, the following claims are made:

1. A combination comprising a tank attached to a sewer-connected toilet bowl, a flushing valve having an inlet and outlet disposed in said tank and having ample flow capacity to flush the toilet bowl independent of said tank, there being no connection between the outlet of said valve and the outlet of said tank, ample space provided between the outlet of said valve and the outlet of said tank to obviate a cross connection between the outlet of said valve and the outlet of said tank, bracketing means for said valve disposed in said tank and having spacing means combined therewith disposed between the top of said tank and a cover provided for said tank, whereby ample air space in proportion to the outlet of said valve and the outlet of said tank, is provided to overcome the effect of vacuum and eliminate the establishing of backflow when a vacuum is created within said valve, the outlet of said valve being projected thru a free condition of atmospheric pressure and standing in substantial alignment with the outlet of said tank, the outlet of said valve forming a jet for high velocity projection into the tank outlet and bowl.

2. Bracket means for spacing the cover of a toilet flushing tank away from the wall of the tank to permit air to enter beneath said cover, said bracket having conjoining means to suspend a flushing valve above the outlet of the tank; the described bracket being a sub-combination for the device described in claim 1.

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