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3,193,846

TOILET FLUSHING APPARATUS

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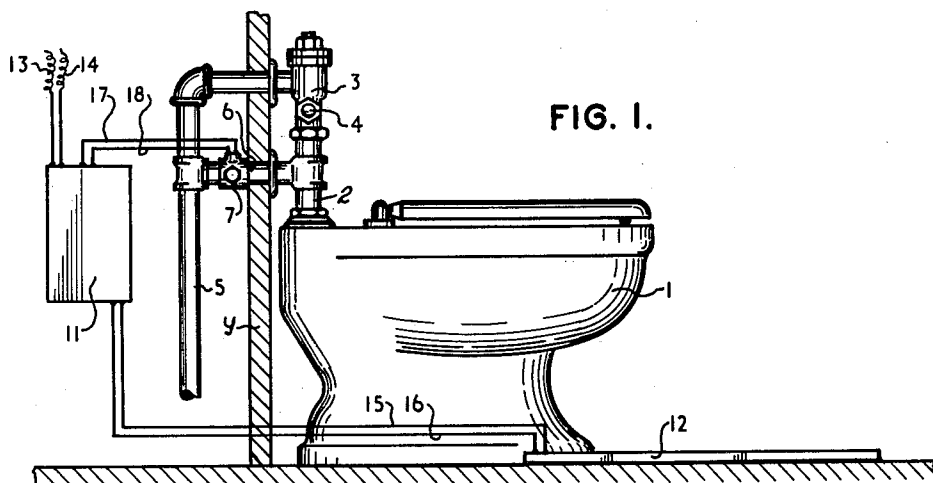


FIG. 1.

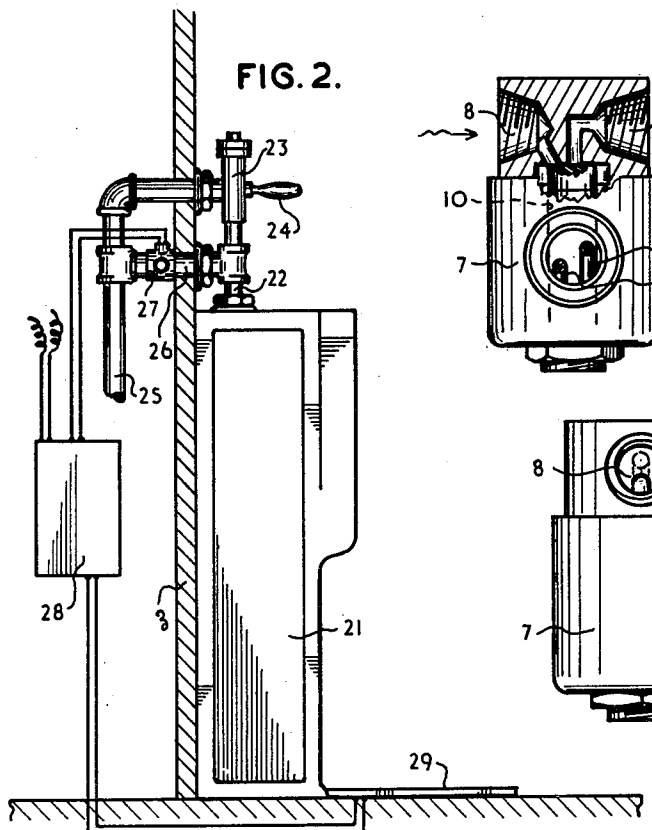


FIG. 2.

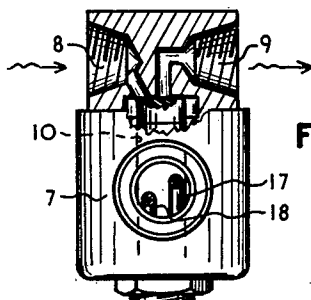


FIG. 3.

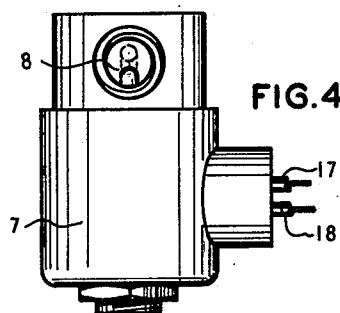


FIG. 4.

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TOILET FLUSHING APPARATUS
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This invention relates to improvements in toilet flushing apparatus, being a continuation-in-part of application #60,180, filed October 3, 1960, now abandoned, and it appertains particularly to a flushing mechanism for use with a toilet unit utilizing water main pressure rather than a gravity fed supply from an associated storage tank.

Usually pressure-operated flushers for toilet bowls, urinals and the like are controlled by a lever or pedal voluntarily manipulated by the user. To avoid a toilet unit being left in unflushed condition by a careless or indifferent person, automatic flushing of toilet units, particularly urinals, in public buildings is now frequently substituted, the automatic flushing device being controlled by a timing device causing intermittent flushing at predetermined intervals. While such periodic automatic flushing meets the object intended, it is nevertheless very wasteful of water as the flushing of the unit occurs whether or not there is need therefor.

The present invention has for a primary object to provide in a novel apparatus combination a comprehensive scheme of pressure flushing designed to meet all needs by allowing of such voluntary flushing as the user may desire combined with the assured automatic flushing following the departure of each user.

It is another object of the present invention to provide a dual type of flushing control for a pressure flushed toilet unit comprising a conventional lever or pedal-operated valve that may be voluntarily manipulated by a person during and/or after using the toilet unit and a valved conduit by-passing such first valve, with the valve in the by-passing conduit being actuated automatically following the use of the toilet unit as by the departure of the user from the toilet unit.

A further object of the invention is to provide a dual control pressure flushing apparatus including an automatic flush valve under electronic, electro-mechanical or other control subject to the presence of the user in the vicinity of the unit and operable on the user's departure.

A further object of the invention is to provide such a dual type of flushing control for a toilet wherein the automatically operated mechanism is not readily discernible by the user of the toilet, being concealed as by a wall or other barrier and/or so constructed as to give the appearance of being part of the usual environment and giving no outward indication of its purpose.

A further object of the invention is to provide a dual type of toilet flushing apparatus wherein the automatic flush means is juxtaposed with respect to the conventional flush means so that the user may be unaware of its existence and the user-actuated control for such automatic flush means is also juxtaposed from the conventional flush means and blended with the usual environment for substantial concealment.

To the accomplishment of these and related objects as shall become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts as shall be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

The invention will be best understood and can be more clearly described when reference is had to the drawings forming a part of this disclosure wherein like characters indicate like parts throughout the several views.

In the drawings:

FIGURE 1 is a side elevation of a toilet bowl equipped with my dual control flushing apparatus;

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FIGURE 2 is a side elevation of a urinal equipped with a similar flushing apparatus, the automatic valve being subject to a person-sensitive electronic or electro-mechanical control shown schematically;

FIGURE 3 is an enlarged plan view, partly shown in section, of the automatic valve in the by-pass; and

FIGURE 4 is a side view thereof.

In endeavouring to provide satisfactory assured flushing of toilet units, especially in public buildings, airports, schools, institutions, hotels, restaurants, theatres, offices, stores, service stations, and the like, many automatically actuated devices have been proposed using circuits controlled by mechanical or electric timers, light sensitive photo-electric cells, intruder circuits and the like. An automatic user-actuated flushing control with an efficient electronic or electro-mechanical delaying circuit such as disclosed in copending United States patent application Serial No. 795,176, is selected as the preferred type of automatic flusher valve actuator for use with the present device and will be referred to hereafter.

Referring now particularly to the drawings, there will be seen in FIGURE 1 a top spud toilet bowl 1 which comprises the waste receiving portion of the toilet unit, with a feed pipe 2 connected thereto. A manually operated flush valve 3 with a clearly exposed hand lever 4 extending horizontally from the side thereof is inserted in the line between the toilet feed pipe 2 and the water pipe 5 that is connected with a suitable water supply preferably under pressure of from 10 or 15 to 100 p.s.i.

A conduit 6 that is substantially concealed runs from the water pipe 5 to the toilet bowl feed pipe 2 so as to by-pass the normally closed manually operated valve 3 and a normally closed valve 7 is inserted in the by-pass conduit 6. The by-pass valve 7 is a solenoid valve having inlet and outlet ports 8 and 9 with the flow therebetween normally stopped by a solenoid plunger 10 in "closed" position, as will be seen on reference to FIGURE 3. The plunger of valve 7 may be retracted or "opened" by energizing the solenoid by any suitable user-actuated circuit such as the several types now being made available on the market but I prefer to employ a time delay electronic or electro-mechanical circuit mechanism similar to or embodying the features of that disclosed in the previously mentioned co-pending application and indicated at 11, with a pressure sensitive pad 12 disposed on the floor in front of the toilet bowl and wired to the electronic circuit mechanism so as to serve as a user-operated circuit closer. Wires 13, 14 are shown for carrying electricity from the usual line to the electro-mechanical circuit mechanism 11, wires 15, 16 connecting the pressure sensitive pad 12, and wires 17, 18 running to the solenoid valve 7 in the by-pass.

The pressure sensitive pad 12 or other suitable user-actuated control is preferably juxtaposed remote from the hand lever 4 and so constructed and arranged as to go unnoticed or give the appearance of being part of the usual environment of the toilet and giving no outward indication of its purpose.

As will be seen in the drawings, a barrier such as a wall Y rises to the rear of the toilet bowl 1 and the valve 3 and conventional lever 4 located in front of this wall are clearly exposed and readily visible to a user of the toilet in the normal way. However, the conduit 6 passes through the wall Y and the normally closed automatic flush valve 7 in such conduit is disposed behind the wall Y, concealed from the user and giving no visible evidence of its existence. By thus separating the automatic valve from the conventional one and effectively concealing it, the confusion or frightening of elderly, illiterate and nervous people is avoided.

An identical assembly will be seen in FIGURE 2 where a urinal 21 standing against a wall Z comprises the waste

receiving portion of the toilet unit and has an inlet or feed pipe 22, a normally closed manually operated flush valve 23 with forwardly projecting, exposed and readily visible hand lever 24 disposed in front of the wall and inserted between the inlet pipe 22 and the water supply pipe 25, a conduit 26 giving really no visible evidence of its existence by-passes the manually operated valve 23 having a solenoid valve 27 therein wired to and automatically operated by the electro-mechanical mechanism at 28 on the actuation of the pressure sensitive pad 29 disposed on the floor in front of the unit. It will be noted that here too the automatically actuated valve 27 is disposed behind the wall Z concealed from the user.

Broadly viewed the flushing apparatus here shown for a pressure flushed toilet unit consists of a conventional manually operated flushing valve 3 (or 23) and a second flushing valve 7 (or 27) that is automatically actuated through a selected or conventional operating circuit 11 (or 28) by the user of the toilet unit on his departure therefrom through the intervention of a weight-operated or pressure sensitive circuit closer mat 12 (or 29) disposed on the floor in front of the toilet unit. Thus there is provision for the usual manual flushing of the toilet unit by the valve 3 (or 23) enabling of the voluntary flushing of the toilet unit at any time before, during or after its normal use or when other means fail and also provision for the assured automatic flushing of the toilet unit by the solenoid valve 7 (or 27) in the by-pass conduit 6 (or 26) following each successive use thereof on the departure of the user from the vicinity of the toilet unit as by his stepping off the circuit closer mat 12 (or 29).

Obviously a pedal operated lever could be substituted for the hand lever 4 (or 24) so that the term manually operated is intended herein to include a foot pedal valve operator as well. Similarly, a seat-actuated circuit closer could be substituted if desired for the electro-mechanical circuit closing floor mat and should herein be considered as an alternative covered by the general expression of automatic or user-operated circuit closer.

Whatever the nature of the conventional flushing device, it is clearly exposed and readily accessible to the user whereas the automatic flushing apparatus as regards both the flush means or valve and user-actuated control therefor are juxtaposed from such conventional flushing device and/or toilet so as to blend with the environment and occasion the user no undue apprehension by leaving him in most cases unaware of its existence.

It is thus evident that a comprehensive flushing apparatus is herein disclosed that will meet all needs for complete flushing service simply by providing in combination with a manually operated toilet flushing mechanism a conduit by-passing the conventional manually operated valve and controlling fluid passage therethrough by a normally closed concealed user-actuated or automatic valve so that the same opens to flush the toilet unit as the user departs irrespective of the use or non-use of the exposed primary conventional valve. Furthermore, it will be clear that in addition to making allowance for both voluntary and automatic flushing there is a real economic factor in this present apparatus as there is no waste of water as in the automatic time-controlled flushing caused by the constant intermittent flushings occurring hour after hour whether the toilet unit is used or not.

What is claimed as new is:

1. In combination with a building having a barrier such as a wall, a toilet unit having a waste receiving portion, a water supply pipe having a water supply under pressure, said toilet unit being disposed in front of said

barrier; a water feed pipe interconnected to said toilet unit for discharge of water into said waste receiving portion thereof; a normally closed, manually operable flush valve located in front of said barrier clearly exposed and readily visible to a user in the regular way; one end of said water supply pipe being interconnected to said flush valve for discharge of water thereinto and one end of said water feed pipe being interconnected to said flush valve for receiving water therefrom; a conduit passing through said barrier, one end of said conduit being attached to said water supply pipe in juxtaposition to receive water therefrom intermediate the end thereof discharging into said flush valve and the water supply thereof, the other end of said conduit being attached to said water feed pipe in juxtaposition to discharge water thereinto intermediate the end thereof interconnected to said flush valve and the interconnection therewith of said waste receiving portion of said toilet unit; a normally closed, automatically actuated valve in said conduit disposed behind said barrier and concealed from the user giving no visible evidence of its existence; and user operated pressure sensitive electrical control means coacting with said automatically actuating valve to open on the departure of a user from the toilet unit said manually operable flush valve and said automatically actuated valve being operable independently of one another.

2. In combination with a toilet unit having a waste receiving portion, a wall adjacent said toilet unit, a water supply pipe having a water supply under pressure located behind said wall; a water feed pipe passing through said wall and interconnected to said toilet unit for discharge of water into said waste receiving portion thereof; a normally closed, manually operable flush valve, said flush valve having a valve operating lever disposed in front of said wall clearly exposed and readily visible to a user of the toilet unit; one end of said water supply pipe being interconnected to said flush valve for discharge of water thereinto and one end of said water feed pipe being interconnected to said flush valve for receiving water therefrom; a conduit passing through said wall, one end of said conduit being attached to said water supply pipe in juxtaposition to receive water therefrom intermediate the end thereof discharging into said flush valve and the water supply thereof, to other end of said conduit being attached to said water feed pipe in juxtaposition to discharge water thereinto intermediate the end thereof interconnected to said flush valve and the interconnection therewith of said waste receiving portion of said toilet unit; a normally closed automatically actuated valve located in a portion of said conduit behind said wall, said automatically actuated valve being thus concealed from the view of the toilet user behind said wall; and user operated pressure sensitive electrical control means coacting with said automatically actuated valve to open on departure of a user from the toilet unit said manually operable flush valve and said automatically actuated valve being operable independently of one another.

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