Aug. 5, 1952 M. C. ANSORGE 2,605,479

FLUSH VALVE ACTUATOR

Filed Sept. 26, 1946

Fig. 1

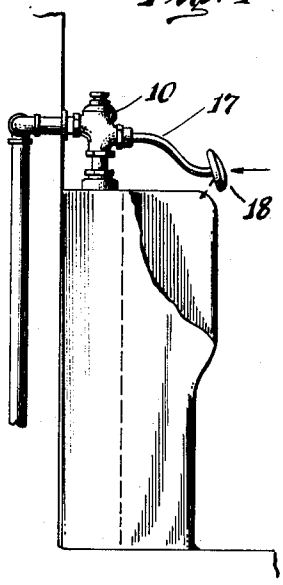


Fig. 5

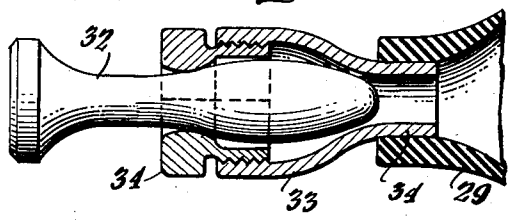


Fig. 2

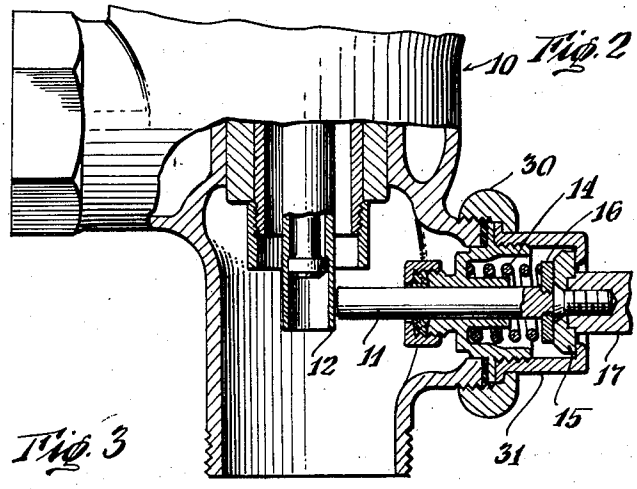


Fig. 3

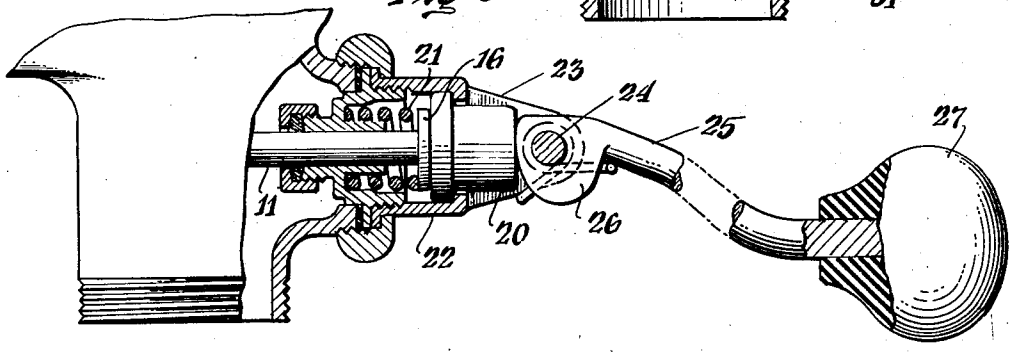
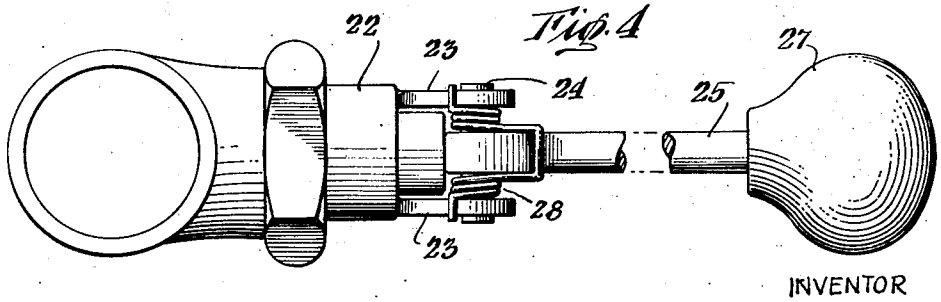


Fig. 4



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FLUSH VALVE ACTUATOR

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2 Claims. (Cl. 4—249)

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This invention relates to flush valve actuators, and particularly to an improved means for actuating a flush valve by body pressure to insure the proper flushing of toilet facilities.

Toilet bowls and urinals in public places usually have flush valves which are actuated by a manually operated handle or by a push button. Because of the substantially continuous use of public toilet facilities by people in all walks and stations of life, the handles or push buttons of such valves may serve as carriers of disease germs; and many people are reluctant manually to grasp the handle or to actuate the push button with the fingers for fear of contracting an infectious disease. As a result, and particularly after urination, the toilets or urinals are not flushed, and the toilet rooms become malodorous and unsanitary.

The management or custodians of many buildings place blocks of antiseptic and odor absorbing materials in the drains of urinals or use other means for keeping the toilet facilities in a more sanitary condition; but almost never do porters or janitors of a building clean the valve actuators with germicidal preparations. Thus proper flushing of the equipment—which is the most satisfactory means of maintaining it odor free and sanitary—is very often not practiced by the public. Studies have shown that pedal or like foot-pressure actuated valves are frequently ignored by the public; and such valves have the further disadvantage of becoming jammed or disordered, requiring the services of a mechanic to restore to operable condition.

It is a principal object of the invention to provide means whereby conventional handle or button actuated flush valves may be simply, easily and practically involuntarily, operated by body pressure and thus obviate the necessity of manually grasping or touching the actuator with the hands.

It is an object of the invention to provide means whereby with slight and oftimes unconscious effort, the user of a urinal or other toilet facility may flush the same during use.

It is another object of the invention to provide means whereby slight body pressure applied in a substantially straight line of effort is converted to an angular movement of the valve actuator for proper operation of the valve.

It is an object of the invention to provide a flush valve actuator which will insure, encourage or induce an adequate flushing of the sanitary equipment.

It is an object of the invention to provide a

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flush valve actuator pursuant to which the toilet facilities will be flushed during each use, thereby to improve the sanitary conditions of frequently-used toilet rooms.

It is an object of the invention to provide a flush valve actuator as aforesaid which is inexpensive to manufacture and install on standard forms of flush valves.

It is still another object of the invention to provide a flush valve actuator which does not in any way modify the internal mechanical structure or method of operation of standard or conventional flush valves.

Other features and advantages will hereinafter be described.

In the accompanying drawings:

Fig. 1 is a vertical elevation of the invention as applied to a conventional urinal of the stall type;

Fig. 2 is a detail showing a conventional flush valve construction and the engagement therewith by the cam plate of the valve actuator shown in Fig. 1;

Fig. 3 is a detail, partly in section, showing one embodiment of the invention as applied to a flush valve of the button operated type;

Fig. 4 is a bottom plan view of the apparatus of Fig. 3;

Fig. 5 is a detail of a method of removably attaching the actuator means to the handle of a standard flush valve.

Referring initially to Fig. 2, the flush valve 10 is illustrated as of conventional type in which inward movement of the spring biased plunger 11 tilts the valve actuator 12 to cause a flow of water from the valve. As is apparent, the plunger 11 is guided for straight inward and outward movement, and inasmuch as the spring 14 is frequently of substantial strength, it is customary to provide a lever type of actuator handle which when tilted causes a cam 15 to rotate about its edge as a fulcrum to exert inward pressure against the end 16 of the plunger 11. It will be noted that the head 15 has a relatively large flat area in contact with the flat surface of the plunger end 16. Upon release of pressure on the handle or equivalent valve actuator, the spring 14 restores the respective parts to the normal Fig. 2 position.

In a preferred form of the present invention, the usual handle of a flush valve of the Fig. 2 type is replaced by or supplemented by a rod or shaft 17 to the end of which is removably affixed the cam 15, as by the screw threaded means shown in Fig. 2. To the end of the rod 17 there

is permanently affixed a plate 18, which may be of the order of 2½ or 3 inches in diameter, and which has a smooth and preferably convex outer surface.

In order to transform forward body pressure against plate 18 into the desired angular movement of cam 15, the plate is inclined from the vertical, as shown, with the result that the plate will tend to move downwardly upon pressure applied thereagainst, to rotate the rod and cam 15 in the direction of movement. The rod 17 may be straight, but preferably has an ogee curvature or is inclined so as to offset the plate with respect to the vertical or horizontal plane of plunger 11. It should be understood that whereas the plate is illustrated as being beneath the level of plunger 11—and this is considered preferable—it may be offset to either side, or may be above the plunger. The length of the rod 17 is such that the plate 18 will preferably be relatively close to the body of the person, who upon leaning slightly forward will exert pressure against the plate.

The handle-actuated flush valve is intended to operate by tilting the handle, because the spring 14 is so strong as to make a direct inward thrust of the handle difficult. Accordingly, forward body pressure as indicated by the solid arrow in Fig. 1, is translated into an angular movement of the rod 17 as indicated by the dotted arrow in such figure. The mechanical advantage obtained by the long rod 17 reduces almost to the point of imperceptibility and bodily effort required to operate the valve, and the flushing of the toilet fixture becomes almost an involuntary or natural act. By making the rod 17 and plate 18 of light materials, the standard spring 14 is completely adequate to return the device to normal position after use.

In contradistinction to the angular movement of the actuator of the conventional lever-operating flush valve type, the push button valve, as shown in Fig. 3, operates by a direct inward movement of the button 20, said movement urging the plunger 11 directly inwardly against the resistance of the relatively weaker spring 21. Although the spring 21 is generally of less strength than the spring 14 of the Fig. 2 type, it nevertheless is such that gentle body pressure thereagainst would be insufficient to press the button 20 inwardly to the extent required to operate the valve. Accordingly the Fig. 3 embodiment of the present invention provides a lever actuator means usable with the standard push button, and pursuant to which light body pressure is mechanically transformed into sufficient pressure to urge the button 20 inwardly.

In Fig. 3, therefore, the conventional socket which forms the cage and guide for the button is replaced by a socket 22 which is provided with lugs 23 on each side thereof. Said lugs 23 rotatably receive a shaft 24 which pivotally carries the actuator rod 25. The head of the rod is provided with or is formed with a cam 26 which is in engagement with the button 20. Although the rod 25 may be provided with a body-pressure plate similar to the plate 18, the Fig. 3 embodiment shows a body-pressure member 27 which is bulbous in shape. Said bulb may be adhesively secured to the end of the rod. Alternatively, the neck of the bulb may be provided with a female threaded insert for cooperation with a threaded end of the rod.

Forward pressure on the body-pressure member 27 will cause a clockwise rotation of lever 25, whereupon the nose of cam 26 will urge the button inwardly to operate the flush valve. Preferably, means such as the coil spring 28 is utilized to return the lever 25 to its initial position after operation, because the spring 21 may not be of sufficient strength, in the usual flush valve, for proper return of the actuator to normal position.

It is obvious that the cam 26 is the equivalent of the cam plate 15 of Fig. 2, and that cam 26 may bear directly against the head 16 of the plunger 11. Without in any way affecting the operation of the device, the button 20 may be eliminated and the structure arranged so that cam 26 directly engages the head 16.

Either of the actuators is easily installed, and does not require any disconnection of piping or shutting off of the water supply. In the Fig. 2 embodiment, it is necessary only to remove the nut 30 and the socket 31, whereupon the conventional handle is removable. The end of the rod 17 is passed through the opening in the socket and the head 15 affixed thereto, whereupon the sleeve and nut are resecured and the apparatus is in condition for immediate use.

In the Fig. 3 embodiment, it is considered preferable to provide a socket 22 having integral lugs 23, and it is contemplated that the socket and rod 25 will be sold for installation as a unit.

Fig. 5 shows means whereby a rod 17 or, in the absence thereof, a body-pressure member 29 may conveniently be applied directly to the valve handle 32 of a conventional flush valve. A female-threaded sleeve 33 has a reduced-diameter neck 34 secured to the inner wall of the member 29. Said sleeve preferably contacts the tapering end of the valve handle, as shown. A split nut 34, having a bore configurated to snugly engage the handle at an intermediate reduced-diameter portion is male-threaded for cooperation with the sleeve 33. Upon placing said sleeve over the handle and making up on the nut, the sleeve is urged to the left of Fig. 5, to tightly come into position against the handle 32 for securement thereto. The member 29 has been fragmentarily shown as of bulbous form, but it is obvious that a member such as plate 18 may be used to equal advantage.

Although the invention has been described by making a fully detailed reference to the certain presently preferred embodiments, such detail of description is to be understood in an instructive rather than a limiting sense, many changes being possible within the scope of the claims hereto appended.

I claim:

1. In combination, a valve actuator for a standard cam actuated flush valve of a urinal, disposed adjacent to and extending transversely outwardly from the large open area of the urinal, which standard cam actuated flush valve includes a reciprocable member reciprocating in a substantially horizontal plane for initiating fluid flow through the flush valve together with a cam bearing against the reciprocable member and against a fixed surface in a vertical plane at right angles to the path of reciprocation and to the horizontal plane of reciprocation, the valve actuator extending from the cam at right angles to the vertical plane of contact area; a first section of the actuator extending parallel to the horizontal plane of reciprocation of the reciprocable member and at right angles to the vertical plane of the contact area; a second section of the actuator attached to the first section and forming an angle with the horizontal plane of

reciprocation; a third section of the actuator attached to the second section parallel to the horizontal plane of reciprocation and extending at right angles to the vertical plane and offset from the horizontal plane of reciprocation by the vertical height of the angular second section; and a plate attached to the end of the third section tilted at an angle to the horizontal plane of reciprocation whereby a pressure on the end plate in a horizontal plane applies a torque to the valve actuator causing the valve actuator and cam to pivot on the fixed surface and thereby actuate the reciprocable member which initiates the fluid flow through the valve.

2. In combination a valve actuator for a standard cam actuated flush valve disposed adjacent to and associated with a toilet fixture, which standard cam actuated flush valve includes a reciprocable member reciprocating in a substantially horizontal plane for initiating fluid flow through the flush valve together with a cam bearing against the reciprocable member and against a fixed surface in a vertical plane at right angles to the path of reciprocation and to the horizontal plane of reciprocation, the valve actuator extending from the cam at right angles to the vertical plane of contact area; a first section of the actuator extending parallel to the horizontal plane of reciprocation of the reciprocable member and at right angles to the vertical plane of the contact area, a second section of the actuator attached to the first section and forming an angle with the horizontal plane of reciprocation; a third section of the actuator attached to the second section parallel to the horizontal plane of reciprocation and extending at right angles to the vertical plane and offset from the horizontal plane of reciprocation by the

vertical height of the angular section section; and a plate attached to the end of the third section tilted at an angle to the horizontal plane of reciprocation whereby said valve actuator is extended from the toilet fixture to a sufficient length so that a horizontal pressure on the plate applies a torque to the valve actuator causing the valve actuator and cam to pivot on the fixed surface and actuate the reciprocable member thereby to initiate said fluid flow through said valve.

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