

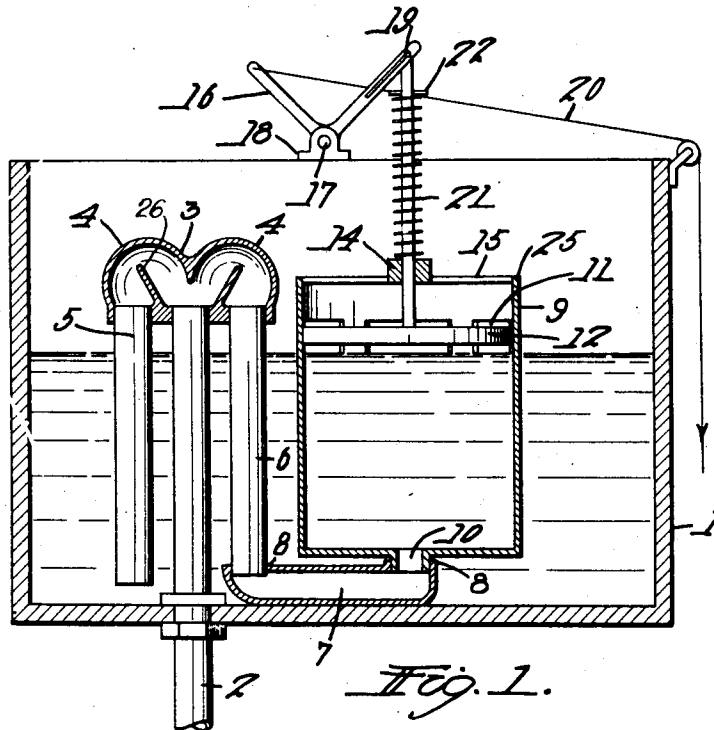
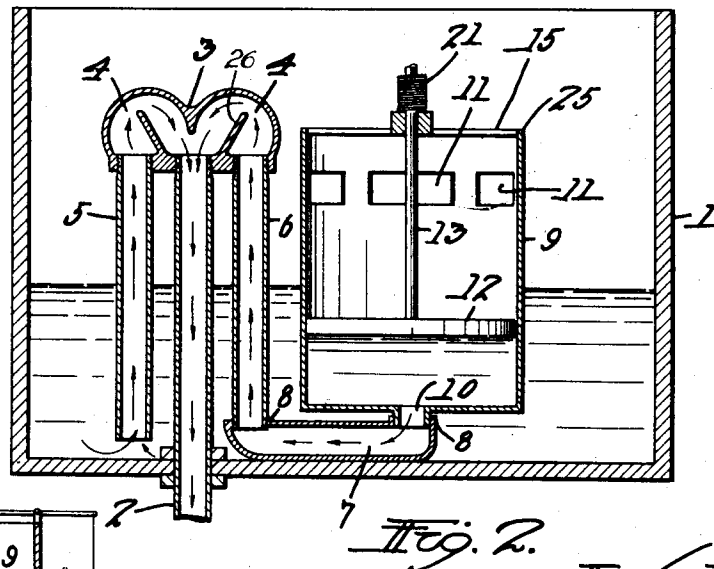
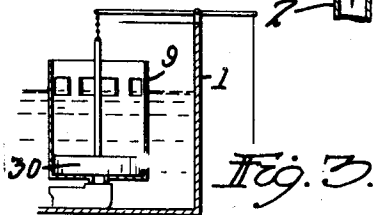
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SIPHON FLUSH VALVE

Filed May 7, 1928



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SIPHON FLUSH VALVE.

Application filed May 7, 1928. Serial No. 275,589.

This invention has relation in general to flush-tanks for water-closets and in particular to the siphon valves commonly used to accomplish the rapid discharge of the water in the tank into the water-closet for flushing the latter.

The invention has as its main purpose the provision of improved means of starting the action of the siphon in order to effect flushing. The particular objects of the invention are to provide a structure to accomplish this end having advantages over prior devices through the elimination of valves, packings, and other means of directing and controlling the flow which commonly cause leakage and other troubles in prior devices as a result of wear, and through positively providing against overflowing of the tank.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which,—

Fig. 1 is a longitudinal vertical section of a tank showing the improved devices comprising the invention, also in vertical section, and in the normal position ready to operate to start the siphon.

Fig. 2 is a view similar to Fig. 1 showing the parts in the relation assumed when actuated to accomplish flushing; and

Fig. 3 is a diagrammatic view of a modified structure.

At 1 is shown the usual tank to hold a supply of water intended to be discharged through a pipe 2 connected with the interior of such tank, to effect the flushing of a water-closet or other device with which the lower end of said pipe 2 may be combined. The pipe 2 constitutes the long leg of the siphon and extends upward within the tank, to a height approximately equalling the height of the head of water desired to be maintained within the tank, and is equipped with a manifold 3 comprising a central aperture which is placed in screw-threaded or other engagement with the upper end of pipe 2, and which has formed therein reverse bends 4, 4, to the screw-threaded lower end of one of which is applied a pipe 5 constituting the short leg of the siphon and extending down with its open end just above the bottom of the tank. A similar pipe 6 is applied to the screw-threaded open end of the other of said reverse bends 4, extending down any suitable or desired distance in the direction of the bottom of the tank, and combined in any suitable manner, as by the

conduit 7 and unions 8, 8, with a cylinder 9 disposed upright in the tank and provided with a bottom opening or port 10 communicating with the said conduit 7. This cylinder 9 is also provided with lateral openings 11, 11, or if preferred, open-topped notches or slots extending down from the rim 25 of the open top of the cylinder, disposed therein with their bottom edges at a height not greater than the water-level which will be maintained in the tank when filled to the predetermined level by the supply-means, the latter being of any common or preferred form.

Within the cylinder 9 is provided a fairly closely-fitting piston 12 mounted on a piston rod 13 which is slidably mounted in a guide 14 formed at the center of the top of the cylinder, as upon a strut 15. The portion of such piston rod extending upwardly through the top of such guide 14 is combined in suitable manner with some such device as a bell-crank 16 so that the piston 12 may be actuated downward when it is desired to discharge the contents of the tank through the siphon. This bell-crank 16 is pivoted on a pin 17 in a bracket 18 on the edge of the tank, pivotally combined at 19 with the upper end of piston rod 13, and equipped with a chain 20 or other device through which the lever may be depressed manually to force the piston downward. An expanding spiral spring 21 applied to the piston rod 13 and confined between the guide 14 on the top of the cylinder and a suitable stop such as the pin 22, tends to keep the piston 12 uplifted above the level of the openings 11, 11, and consequently to keep the bell-crank 16 and its chain upheld. To retard a sudden flow an upwardly and backwardly slanting integral wall 26 is provided in the manifold.

The operation of the device is simple and will be easily understood. With the tank filled and the parts at rest in their normal relation ready for the flushing operation, the bell-crank 16 and the piston 12 are in upraised position as shown in Fig. 1, and the cylinder 9 is full of water which has flowed in through the openings 11, 11. When the bell-crank 16 is rocked, the piston 12 is forced downwardly past the openings 11, 11, and during the remainder of its downward travel forces the contents of the cylinder 9 out through the port 10 and through the conduits 7 and 6 into the manifold 3.

The piston and cylinder constitute in effect a pump to inject the contents of the cylinder into the top of the siphon. Thence the contents descend through the pipe 2 which constitutes the long leg of the siphon and which has remained empty up to this moment. With the pipe 2 filled with water thus expelled from the cylinder, to a point below the level of the bottom of pipe 5, the siphon is started, and water is drawn upward from pipe 5 through the reverse bend 4 in communication therewith, and continues to flow downward under gravity through the pipe 2 until the contents of the tank are exhausted down to the level of the bottom of such pipe 5.

When the pipe 2 has thus drained empty again, and air is admitted beneath the piston through conduits 6 and 7, the spring 21 acts to move the piston 12 reversely upward in the cylinder 9 to its starting point above the level of the openings 11, 11, therein. Thereafter the supply means refills the tank to a point slightly above the level of such openings, whereupon the cylinder again fills with water overflowing thereinto through the said openings 11, 11, and the device is in readiness to function again.

As will have been observed, the device of the invention in its simplicity has entirely eliminated the use of moving valves, gates, etc., for controlling and directing the course of the water in discharging or refilling. Also, no packing or glands applied to moving members are used or needed in the entire structure. Thus a serious limitation in the utility and life of prior types of these devices is eliminated; manufacturing costs are reduced, and wear, leakage, and sticking of such parts are not factors to be contended with in the present invention. There are no submerged moving parts subject to corrosion, other than the piston and a portion of its piston rod, and the wide clearance permissible in the fit of the piston in its cylinder reduces all practical chance of trouble arising in connection therewith. The conduit comprising the siphon is air-tight at all times as a result of such absence of valves, glands, etc., from its walls, and through the submergence of the only possible points at which air could enter to

break the siphon undesiredly. Further, the short leg of the siphon is always open to provide an overflow of the tank-contents into the discharge pipe 2. The design of the present device does not require the closing of the short leg of the siphon by a valve or gate while water is being introduced into the long leg to start the siphon; there is no valve thus employed to block escape of water in the common event of the automatic supply-valve failing to shut off the supply completely when the tank has been refilled to the predetermined water-level. Thus the tank in which the present invention is installed cannot overflow to do damage.

In Fig. 3 I have shown a modified construction in which the piston 30 is of substantial weight and operates under the force of gravity, the inoperative upward stroke being manually performed.

Although I have illustrated and described only two forms of the invention, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited in this respect.

What I claim as my invention is,—

1. A siphon for the purpose described comprising a long discharge leg, a short supply leg and a manifold connecting them at the top, said manifold having an integral wall extending upwardly and backwardly from a point between the two legs to retard a sudden flow.

2. A siphon for the purpose described comprising a long outlet leg, two short supply legs and a manifold connecting the three legs together and consisting of a single member having passages from both of the supply legs to the outlet leg and two walls projecting inwardly from a position between the central outlet leg and each of the supply legs in opposite directions and upwardly and a central projection extending downwardly directly over the outlet leg to prevent the water from passing up one supply leg and shooting across into the other one.

In testimony whereof I have hereunto affixed my signature.

GEORGE N. GARABEDIAN.