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A. P. LUDWIG

FLUSHING DEVICE

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Fig. 1.

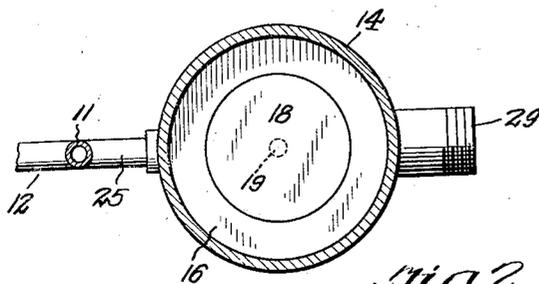
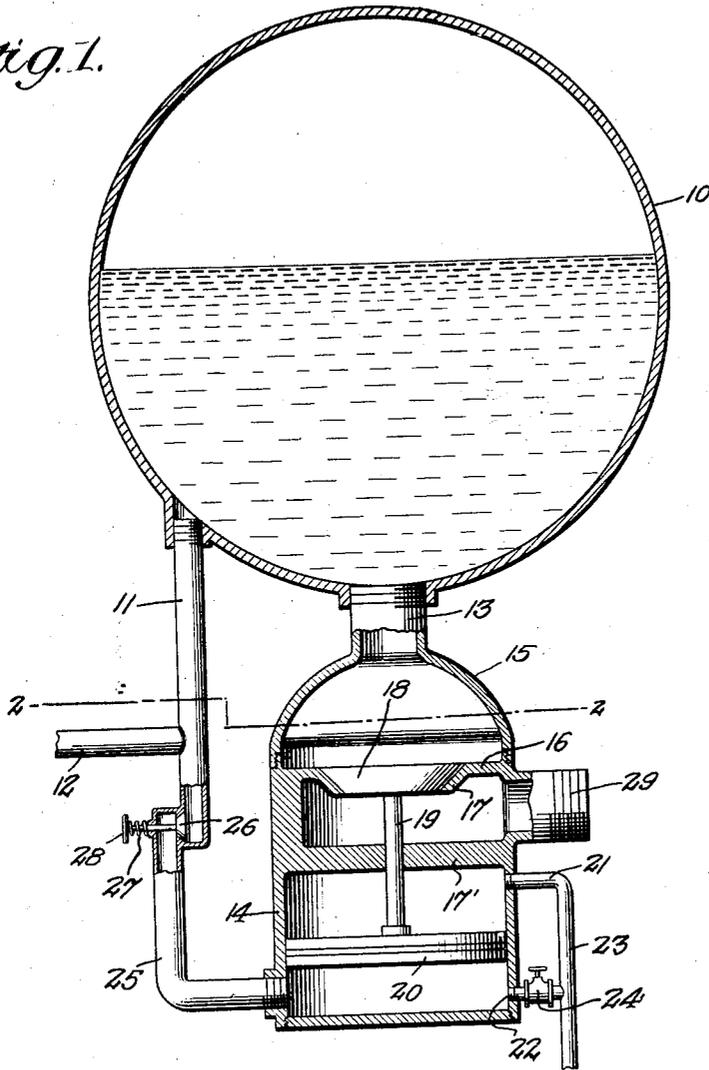


Fig. 2.

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FLUSHING DEVICE.

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To all whom it may concern:

Be it known that I, ALFRED P. LUDWIG, a citizen of the United States, residing at Cristobal, in the Canal Zone, Panama, have invented certain new and useful Improvements in Flushing Devices, of which the following is a specification.

The present invention relates to flushing valves for various uses, and has more particular reference to that type of flushing valve wherein an auxiliary manually operable valve is employed for initiating the opening of a main flushing valve.

An object of the present invention is to provide a relatively simple and economical structure of flushing apparatus, which may be easily installed without occupying undue space, and which is arranged to utilize the supply pipe or tank pressure for opening the main valve so that the full force and body of water may be admitted through the device for flushing purposes.

The invention also aims to provide an improved mounting and structure of valve and operating piston wherein when the piston is opening and closing the pressure of the main body of water or supply pipe is prevented from operating upon the side of the piston toward the valve when the valve seat faces oppositely from the piston. In other words, this object of the invention leaves an enclosed chamber above the piston which is adapted to be exhausted of air or other fluid while the valve is being opened, and which serves as a dashpot for preventing the sudden closing of the valve after the pressure has been relieved at its under side.

The above, and various other objects and advantages of this invention will in part be described in, and in part be understood from the following detailed description of the present preferred embodiment of the invention, the same being illustrated in the accompanying drawing, wherein—

Fig. 1 is a vertical section taken through a flushing device structure according to the present invention, and

Fig. 2 is a transverse section through the upper end of the same substantially on the line 2—2 of Fig. 1.

Referring to the drawing, 10 designates a supply tank of any approved construction and size, and which is adapted to receive in its lower portions a quantity of water or other fluid from a branch pipe 11, which leads to a supply pipe 12. The upper portion

of the tank 10 is adapted to contain air under pressure of the water from the supply pipe 11. The supply pipe 12 is adapted to deliver water under pressure to the apparatus.

The tank 10 is supported directly upon the upstanding neck 13 of a cylindrical casing 14, the casing 14 terminating at its upper end in a dome 15 which merges into the neck 13. The neck 13 is preferably exteriorly screw threaded to engage in a threaded boss in the bottom of the tank 10. The casing 14 is closed at its bottom, and is provided with vertical spaced upper partitions 16 and 17. The partition 16 is uppermost and is slightly below the base of the dome 15 and is provided with an upwardly facing valve seat 17, upon which normally rests a valve 18. The valve 18 has a stem 19, which projects downwardly through a space beneath the partition 16 and through the second partition 17. A piston 20 is mounted upon the lower end of the valve stem 19 below the partition 17 and that part of the casing 14 which lies below the partition 17 forms a cylinder in which the piston 20 may operate. The cylinder is connected at its upper and lower ends by branches 21 and 22 from an exhaust pipe 23. The branch 22, being the lower branch, is provided with a controlling valve 24 adapted to check the outlet of fluid from beneath the piston 20 as the latter descends. The lower end of the casing 14, or cylinder, is connected by pipe 25 with the supply pipe 12 and the branch pipe 11 so as to receive fluid from either the pipes 11 or 12, or both, and is provided below the juncture of the pipes 11 and 12 with a small valve 26 normally seated in the pipe 25 by a spring 27, and adapted to be unseated or opened by a push button 28. The button 28 is a stem which connects it to the valve 26 and about which the spring 27 engages, the spring being interposed between the button 28 and the adjacent side of the pipe 25.

The space between the partitions 16 and 17 comprises the outlet chamber, and such chamber is provided with an outstanding threaded nipple 29 to which a pipe or the like is adapted to be attached for receiving the fluid under full force from the tank 10.

In operation the valve 26 is normally closed, and water from the supply pipe 12 passes into the branch pipe 11 and into the tank 10, filling the same to the point where the air and water pressures are equal, and

also filling the upper chamber or dome 15 of the casing. The main valve 18 is also normally closed and held closed by the pressure of air in tank 10, by the weight of the valve 18 itself and that of the piston 20, and by the column of water above the valve 18. When it is desired to flush through the pipe or nipple 29, it is only necessary to depress the button 28 and open the valve 26 and maintain said valve open for the desired period of time to permit a quantity of water from the tank 10 and supply pipe 12 to pass down through the pipe 25 and into the lower end of the cylinder in the casing 14. As the fluid enters the casing beneath the piston 20 it raises the latter and through the valve stem 19 lifts the main valve 18 from its seat 17, permitting the flushing operation through the large valve seat 17 and pipe 29. As the piston 20 rises, the fluid above the piston is exhausted through the branch pipe 21 and into the exhaust pipe 23. As soon as the handle 28 is released, the supply of fluid to the under side of the piston 20 is cut off, and the piston by its weight forces the fluid therebeneath out through the lower branch 22 into the exhaust pipe 23. The valve 24 is adjusted so as to permit the gradual escape of the fluid from the lower end of the cylinder to limit the time of closing of the valve 18. The intake pipe 25 is, of course, of relatively large diameter as compared to the branch pipes 21 and 22, and consequently, the inflow of fluid to the under side of the piston 20, when the valve 26 is open, is of greater volume than the volume of fluid exhausted from the branches 21 and 22. The piston 20, therefore, cannot vibrate rapidly between the ends of the cylinder and must necessarily move at a slow rate of speed and offset water hammer, vibration or pounding incident to the sudden onrush of water through the upper partition 16.

It will be noted that the partition 17' has but a small opening therethrough to receive the stem 19 and that the fluid which is flushing through the outlet chamber cannot gain access to the cylinder in the bottom of the casing. This keeps the weight of the water from the upper side of the piston, and permits the latter to respond to the quick pressure from the tank 10. The structure of the casing 14 is such that it accommodates the dome for supporting the tank and for receiving the water initially from the tank, provides a separated outlet chamber for the water between the partitions, and also provides in its lower end a cylinder for the piston which is independent of the other chambers in the casing, and which is so arranged beneath the partition 17' as to prevent the pressure of water upon the upper side of the piston 20.

It is, of course, understood that various

changes and modifications may be made in the details of construction and design of the pipes and other parts of the flushing device without departing from the spirit of this invention, such changes and modifications being restricted only by the scope of the following claims:—

What is claimed is:

1. A flushing device comprising a casing having space partitions therein providing a receiving dome, an outlet chamber and a cylinder, a valve seated in the bottom of the dome and having a valve stem projecting through the outlet chamber and into the cylinder, a piston in the cylinder connected to the stem, regulatable means for controlling exhaust from the bottom of the cylinder, a tank connected to said dome of the casing for supplying fluid thereto, a supply pipe having one branch leading to the tank and a second branch leading to the bottom of said cylinder, and a manually operable valve in said second branch of the supply pipe for admitting fluid to the bottom of the cylinder for elevating the piston and opening the main valve, said second partition being adapted to center the valve stem and prevent passage of fluid from the outlet chamber to the cylinder.

2. In a flushing device a tank, a casing arranged beneath the tank for supporting the same and having a dome on its upper end and a threaded neck at the apex of the dome for engaging the tank, said casing having a horizontal partition at the base of the dome and a large valve seat in said partition and having a second partition spaced below the first and provided therebetween an outlet chamber and a cylinder beneath the second partition, a valve in the dome adapted to normally rise on said seat to maintain water in the tank and dome, and having a valve stem projecting downwardly through the second partition into the cylinder, a piston in the cylinder connected to the valve stem, an exhaust pipe having one branch opening into the top of the cylinder, and a second branch opening into the bottom of the cylinder, a controlling valve in the second branch of the exhaust pipe to time the outflow of fluid from the bottom of the cylinder, a supply pipe connected to the tank and to the bottom of said cylinder, a manually operable valve in said supply pipe near the bottom of the cylinder for controlling the passage of fluid thereto for elevating the piston.

3. In flushing apparatus, a casing having a dome upon its upper end terminating in a threaded neck and provided with horizontally spaced partitions dividing the casing into an upper and lower and intermediate compartments, an outlet nipple connected through the casing with the intermediate compartment, said upper partition having a

main valve seat therein facing upwardly, a valve on said seat having a stem depending through the lower partition, a piston in the lower compartment connected to the valve stem for raising and lowering the valve, a tank having a threaded opening in its lower side adapted to receive said neck therein for interconnecting the tank and upper compartment of the casing, a supply pipe having one branch leading to the tank and a second branch leading to the lower end of said compartment of the casing, a normally closed valve in the said second branch of the supply pipe for admitting water under pressure beneath said piston to raise the same and open the main valve, and an exhaust pipe having branches leading to the upper and lower ends of said lower compartment of the casing, and being of less diameter than the said second branch of the supply pipe for retarding the action of the piston in opening and closing the main valve.

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