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WATER INLET VALVE FOR TANKS

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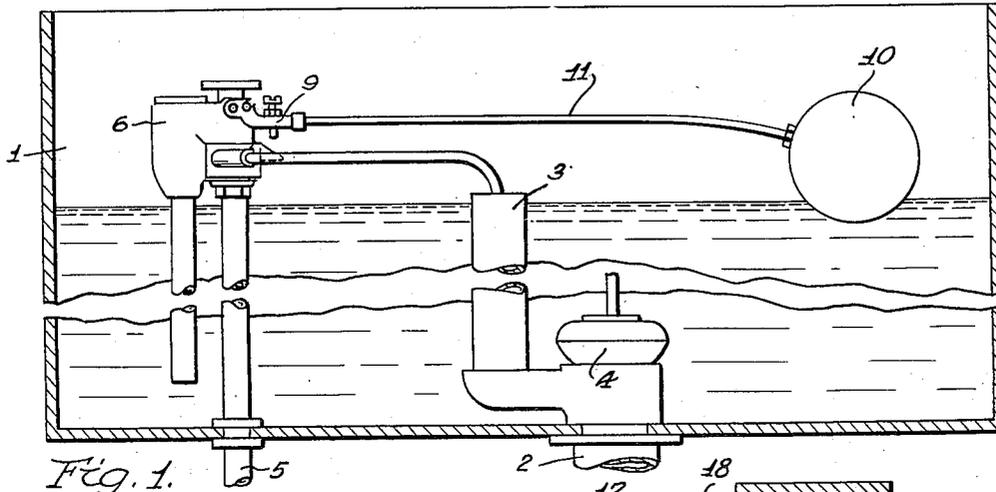


Fig. 1.

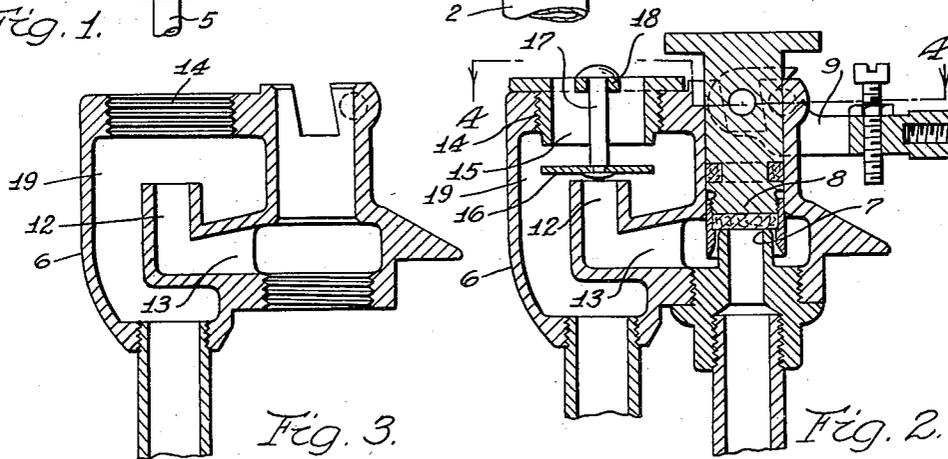


Fig. 3.

Fig. 2.

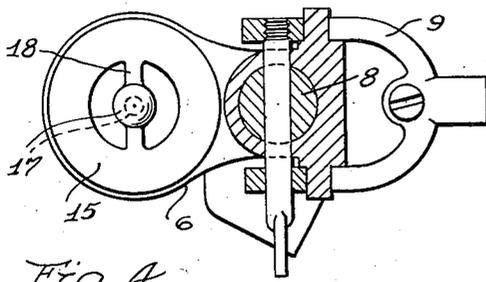


Fig. A.

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WATER INLET VALVE FOR TANKS

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3 Claims. (Cl. 251—127)

The present invention relates to a water inlet of the float controlled type. It is particularly adapted for controlling the supply of water into a tank.

As is known to the art to which this invention pertains, it is impossible to entirely prevent the formation of partial vacuums in water supply lines and the only known reliable method of preventing back siphonage is to control the vacuum at each individual plumbing fixture where there is possibility of back siphonage so that when a partial vacuum occurs in a supply line no pollutional matter can be drawn into the supply line through a submerged opening in the fixture. The primary object of the present invention is to provide a valve or fixture of the character above referred to, wherein the outlet valve is submerged, and embodying vacuum breaking means which functions in the presence of a partial vacuum in the supply line to admit air into the supply line to dissipate the partial vacuum. Back siphonage, by drawing water through the submerged fixture outlet to relieve the partial vacuum is thus made impossible.

In a device of the character of this invention it is essential that it be silent as well as reliable in operation, and another object of the invention is to provide a vacuum breaking means which is silent and entirely reliable in operation, both as to the possibility of becoming inoperative due to becoming clogged and as to its capacity for admitting air at a rate sufficient to dissipate the vacuum in a very short period of time. This object is accomplished by constructing the device with an unrestricted air opening and so that it will not spit water. Unrestricted air entrance is highly important, particularly in the presence of a large volume of piping because the length of time must be very short in order that the partial vacuum be dissipated so rapidly that it cannot act with respect to the submerged fixture outlet to draw water therethrough.

Another object of the invention is to provide a fixture of the above mentioned type embodying a vacuum breaking means which normally remains open and which closes automatically when conditions are normal due to impingement of water flowing through the fixture thereagainst. The vacuum breaking valve is constructed whereby gravity holds it open when no flow is present, and the flow of water through the fixture forces it to its closed position. The vacuum breaking valve is positioned above the level of the water in which the fixture outlet is submerged and when

it is open it is impossible to siphon water through the submerged outlet.

With the above and other ends in view the invention is more fully described with reference to the accompanying drawing, in which

Figure 1 is a vertical section of a tank, showing in elevation the fixture for controlling the water supply thereto;

Fig. 2 is a vertical section of the fixture;

Fig. 3 is a vertical section of the fixture body, and

Fig. 4 is a section taken on the line 4—4 of Fig. 2.

Like characters of reference are employed throughout to designate corresponding parts.

The numeral 1 designates a conventional flushing tank having an outlet pipe 2, an overflow pipe 3, and a valve 4 for controlling the outlet pipe. Because the type of valve shown at 4 and the means for operating the same are already well known in the art the operating means has not been shown here.

A water supply pipe 5 extends upwardly through the bottom of the tank 1 and has a valve body 6 mounted upon its upper end. Within the valve body 6 is a valve seat 7 and a valve 8 which is adapted to seat thereupon. The valve 8 is moved into and out of contact with the seat 7 by a pivoted fitting which is actuated by the float 10 on the end of the rod 11. This structure is already known to the art, being shown in prior Patent 1,389,907, issued September 6, 1921.

Within the valve body 6 is a vertically directed conduit 12 to which water is supplied from the supply pipe 5 through a passage 13 when the valve 8 is unseated. Directly above the open end of the conduit 12 is a screwthreaded opening 14 receiving a valve seat member 15. A disk valve 16 is mounted upon a pin 17 which is slidably mounted in a supporting member 18 in the valve seat member 15. The conduit 12 opens into a chamber 19 from which the outlet pipe 20 extends downwardly into the tank 1 to a point adjacent the bottom thereof.

When the valve 8 is unseated the water flowing through the conduit 12 impinges against the valve disk 16 and moves it vertically to seat it against the valve seat 15. The water then discharges from the chamber 19 through the outlet pipe 20. In the event a partial vacuum exists in the supply pipe when the valve 8 is unseated and the lower end of the outlet pipe 20 is submerged atmospheric air passes through the valve fitting 15 and the conduit 12, which is above the top of the overflow pipe 3, to dissipate the vacuum.

thereby making it impossible for water to be drawn into the inlet pipe 5 from the outlet pipe 20.

Although a specific embodiment of the invention has been illustrated and described it will be understood that various changes may be made within the scope of the appended claims without departing from the spirit of the invention and such changes are contemplated.

What I claim is:

1. In a device of the character described, a hollow valve body having an outlet chamber and having an air vent leading out of the upper end of said chamber to outside atmosphere, an inlet duct extending transversely into said chamber below said vent, said inlet duct turning upward within said chamber and having an opening directed upwardly toward and in spaced relation to said vent, a pressure responsive valve to control said vent and interposed between said inlet opening and said vent, a stem for said valve and extending vertically upward and projecting externally of said casing, means slidably receiving and guiding said stem, said means and said stem having cooperating stop means to limit downward movement of said valve to a position slightly spaced from and above said inlet.

2. In a device of the character described, a hollow body having a top wall provided with an opening therethrough, a tubular fitting secured in said opening and at its lower end having a downwardly facing seat within said hollow body, said fitting at its upper end being open for escape of air and overflow of water, an inlet duct

integral with said body, said duct extending transversely within said body and substantially centrally thereof turning upwardly and having a water outlet facing toward and aligning with said air vent, an outlet below and in alignment with said air vent, a pin slidably supported by said fitting centrally thereof, and a pressure responsive disc valve carried by said pin to control said air vent, said pin having a stop to limit downward movement of said valve to within close proximity of the water outlet.

3. In a device of the character described, a hollow body having a top wall provided with an opening therethrough, a removable member partially closing said opening and having an opening therethrough providing a vent communicating with said body, said second-named opening being provided for escape of air and overflow of water, an inlet duct integral with said body, said duct extending transversely within said body and substantially centrally thereof turning upwardly and having a water outlet facing toward and substantially in alignment with said second-named opening, an outlet below and substantially in alignment with said second-named opening, a valve member movable upwardly by water pressure acting thereagainst for substantially closing said second-named opening and movable downwardly by gravity upon decrease in water pressure acting thereagainst, and means operable to limit downward movement of said valve member to space said valve member from said duct outlet.

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