

April 28, 1942.

F. ZUGELTER

2,280,876

ANTIPOLLUTION DRINKING FOUNTAIN

Filed May 19, 1939

2 Sheets-Sheet 1

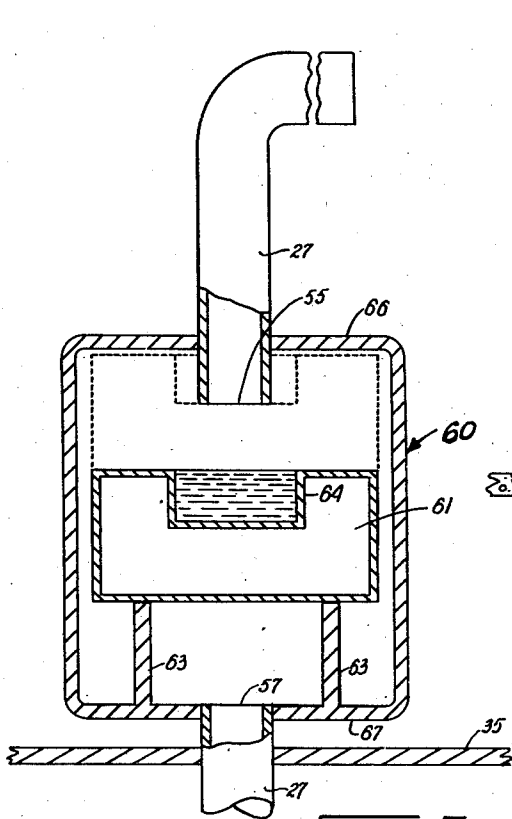


FIG 3

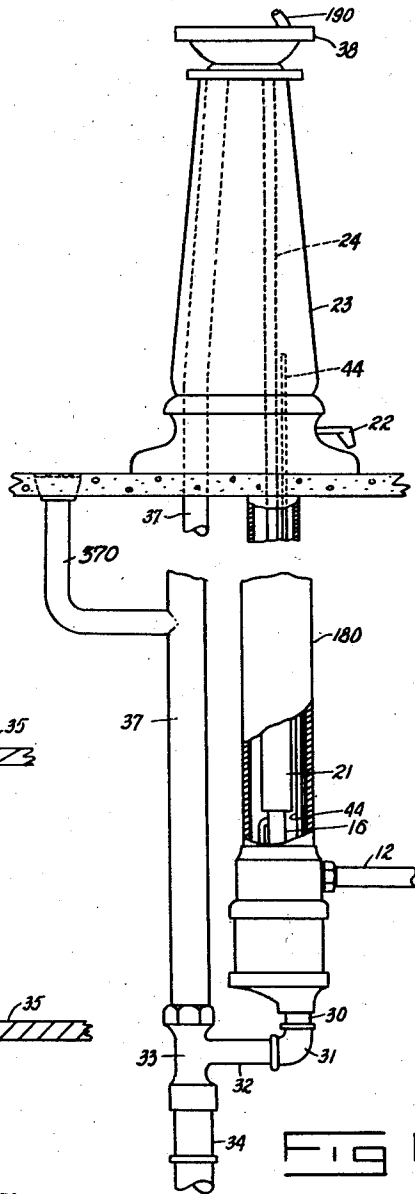


FIG 1

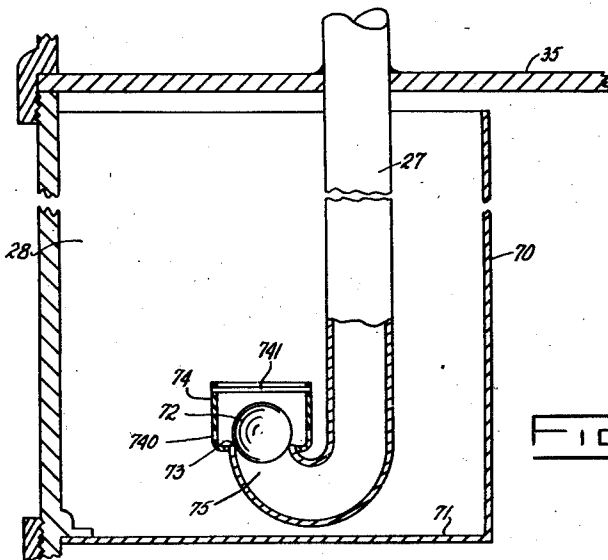


FIG 4

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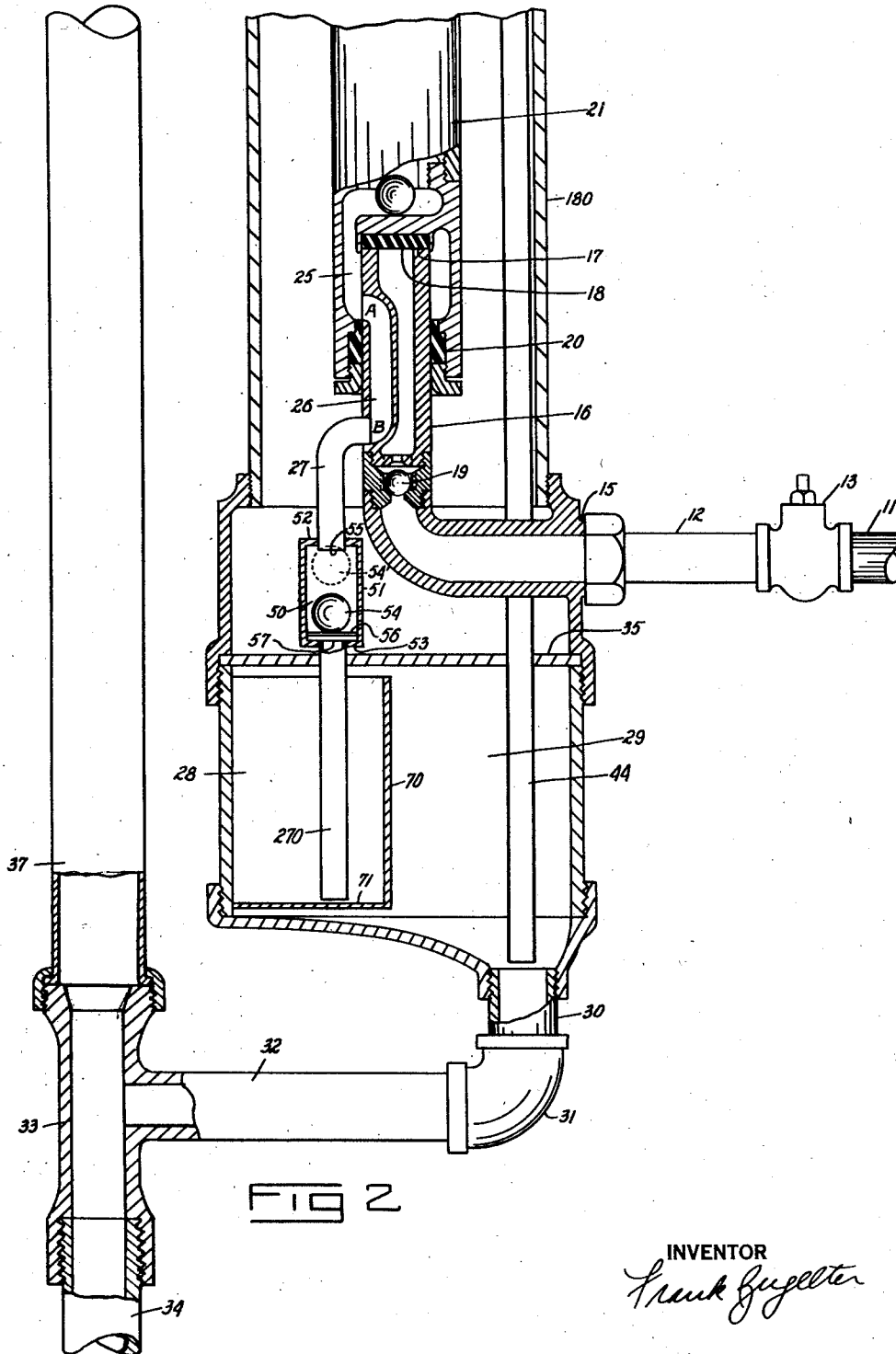
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,280,876

ANTIPOLLUTION DRINKING FOUNTAIN

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Murdock Manufacturing and Supply Company,
Cincinnati, Ohio, a corporation of Ohio

Application May 19, 1939, Serial No. 274,603

2 Claims. (Cl. 137-78)

This invention relates to the so-called anti-freeze, anti-pollution drinking fountains and more particularly to improvements upon the inventions disclosed in the Bart et al. patent application, Serial No. 262,926, filed March 20, 1939, and Murdock et al. patent application Serial No. 245,438, filed December 13, 1938.

Said Bart et al. application explains a remote possibility of dissipation of the safe drinking water column or compensating column of fresh water in structures such as exemplified in said Murdock et al. application, and in order to minimize said remote possibility, said Bart et al. application discloses the use of a check valve in the fresh water supply line to sustain such compensating column during periods of time or co-existence of conditions in the fresh water supply line and in the drain or sewer connections, when such dissipation might occur in the said Murdock et al. disclosure.

An object of the instant invention is to further minimize the possibility of such dissipation.

Another object is to provide means that may be employed in conjunction with or as an alternative to the indicated check valve in said Bart et al. application.

The instant invention is concerned with means adapted to protect the contents of the fresh water reservoir of said Bart et al. and Murdock et al. disclosures by preventing the formation of a protecting fresh water column about and around the main fresh water control valve, thus precluding flow of such protective fresh water supply, back into the fresh water supply line, under any conditions to which a fixture of the type under consideration, might be exposed or subjected.

Thus an object of the present invention is to provide means supplemental to those disclosed in the aforesaid copending applications, whereby there is obviated any possibility of a cross connection being established between the sewer main and the fresh water supply line.

A further object of the invention is to provide simple and effective means for attaining the indicated objectives.

These and other objects are attained by the means described herein and illustrated in the accompanying drawings, in which:

Fig. 1 is a diagrammatic plan view of a typical drinking fountain assembly, parts thereof being broken away and parts being enlarged relative to other parts thereof and disclosing various features of the invention.

Fig. 2 is an enlarged sectional view of parts

shown in Fig. 1 and forming details of the invention.

Fig. 3 is an enlarged sectional view showing a modification forming a detail of the invention.

Fig. 4 is an enlarged sectional view showing another modification forming a detail of the invention.

In connection with the instant disclosure, it is to be understood that the structures disclosed in said copending applications have been tested to determine that they are absolutely effective and unfailing under conditions of flow of sewage under high pressure, from sewer connection 34, as shown herein, to drain and vent connection or pipe 37. Particularly is that true as concerns said Bart et al. application.

The instant invention is concerned essentially with relatively long continued, low pressure backing up of waste water into the pipes and drain connections such as 34, 33, 37, 32, 31 and 30 and air chamber 29, as shown herein. Under such conditions, coincident with an absence of water under pressure in the fresh water supply line, particularly in a structure as shown in said Murdock et al. application, the fresh water compensating column extending, above the main water valve, can gravitate into the fresh water supply pipe upon manual operation of the foot lever for unseating the main water supply control valve. Repeated operations of the foot lever under such conditions would exhaust the fresh water in the fresh water reservoir and contaminated water would then replace the fresh water in the fresh water reservoir. The possibility of such dissipation of the water in the fresh water column is substantially precluded by the structure disclosed in said Bart et al. application.

Referring to the drawings herein, a suitable source of safe water supply 11 is connected through stopcock 13 and a suitable conduit 12 to a suitable fitting 15, which comprises the intake end of a water supply nozzle or main water supply valve member 16.

A check valve 19 may be provided in water line 15, 16 as shown and explained in said Bart et al. application.

Use of a check valve such as 19 is optional and if used same functions as a supplemental or as an alternative safety factor in connection with the instant invention. The valve 19 serves to prevent return flow of fluid to pipe 12, but permits flow of water under pressure to valve 17, 18.

The upper end 17 of the water supply nozzle or pipe member 16 extends upwardly into the

relatively fixed housing or casing 180 and serves as a valve seat for which the main valve 18 is provided. Valve 18 is connected with a vertically reciprocable actuating casing or pipe 21 which is adapted to be raised and lowered by means of a suitable foot pedal 22 associated with pedestal 23, in the manner explained in the said Murdock et al. and Bart et al. applications, and in such patents as Murdock 164,864, 1,146,946 and 1,419,292. A suitable fresh water supply line pipe 24 is provided interiorly of casing 21 for delivering water to nozzle 190 when foot pedal 22 is operated to unseat valve 18.

The lower end of the actuating casing 21 is provided with suitable packing means, as indicated at 29, whereby to provide a leak-proof seal with the outer surface of main water supply valve member 16. A suitable by-pass 25 including a channel or way 26 formed in the main water supply valve member 16 is provided to facilitate drainage of the contents of fresh water supply line or pipe 24 during those periods of time when valve 18 is seated upon valve seat 17. The upper port A of channel 26 is blocked off or closed by packing 20 when foot pedal 22 is actuated to raise casing 21 and unseat valve 18 whereby the fresh water from the main water supply nozzle 16 is delivered through pipe 24 to discharge nozzle 190.

The lower port B of channel 26 is connected by means of a suitable conduit or drain pipe 27, 270 with a fresh water reservoir 28 which is disposed, as shown, within air chamber 29, the upper wall of which comprises a suitable diaphragm 35. Fluid discharged into air chamber 29 is adapted to drain out therefrom through a suitable nipple or coupling 30, elbow 31, and arm 32, of an ejector fitting 33 into a suitable sewer (not shown), via pipe 34.

The parts hereinabove referred to correspond in operation and function with the disclosures made in the said copending applications of Murdock et al. and Bart et al.

As disclosed in the Bart et al. application, Serial No. 262,926, filed March 20, 1939, a low pressure relief tube 44, which corresponds to and functions as does tube 34 in said copending application, is provided.

In the form of the invention embodied in Fig. 2 hereof, means are provided in or in association with the drain tube 27, for sealing tube 27 against return of water from the fresh water reservoir 28 to the space about and above the main valve 17, 18. Said means comprises a housing 51 having therein a chamber 50. The housing is interposed between the adjacent ends of the tube 27, 270. A floating valve ball 54 of suitable material is provided interiorly of chamber 50. The ball valve is adapted to seat against end 55 of conduit 27 when lifted to the position indicated by 54', by reason of a column of fresh water entering said housing from reservoir 28 through the lower tube or conduit section 270.

Under normal conditions, ball 54 is disposed in the lower portion of housing 50, as shown, whereby drainage of fresh water supply pipe 24 may occur. Preferably means such as grid 56 is provided in the lower portion of chamber 50 to prevent valve 54 from closing or sealing the upper end 57 of the lower conduit section 270.

In the event that the sewer system should become plugged or clogged under conditions such that sewage, rising in pipe 34, would rise in the vented fountain bowl drain pipe 37, a compensating column of pure water from reservoir 28 would be forced upwardly in tube 270 and chamber 50.

If the rise of the fresh water column in tube 270 and chamber 50 is sufficient to float the valve 54 into sealing position at the lower end of tube 27, the air seal and water seal provided by the parts under consideration, preclude any further rise of sewage in chamber 29 as well as any rise of fresh water from the reservoir 28 to the main valve 17, 18. Consequently, opening and closing of the main valve 17, 18, regardless of the condition existent in the main water supply line 11, 12, will not cause dissipation of the supply of fresh water in the reservoir. Thus the fixture is protected against entry of any contaminated matter into the reservoir 28.

The vent pipe 37 provides a means for limiting the pressure or weight of the water column operative on the valve 54.

Fig. 3 discloses a modified form of means for limiting the height of a fresh water compensating column in tube 27, 270. The means disclosed herein comprises an outer shell or chamber 60 in which a float 61 is housed. Such a float may comprise a hollow metallic shell or it may comprise a solid piece of suitable buoyant substance such as cork, balsa wood or the like. If cork or the like is used, it may be waterproofed, for example with a paraffin coating. Such a float is adapted for vertical movement within casing 60, and in order to prevent the lower edge of said float from sealing or closing the upper end 57 of the lower section of conduit 270, suitable upstanding legs, such as 63, may be provided as shown.

A well or recess 64, is provided in the upper surface of float 61, said well or recess being adapted to receive the lower end 55 of tube 27. Float 61, under normal conditions, is disposed upon legs 63 and water draining from fresh water supply pipe 24 is discharged from end 55 of conduit 27 onto the upper surface of float 61, whereby the well or recess 64 will always contain a quantity of pure water. This water acts as a trap seal when float 61 has been elevated by reason of chamber 60 being filled with pure water from water reservoir 28 during periods wherein back water is present in chamber 29 as previously explained. A sufficient quantity of air may be trapped in the upper portion of casing 60 to effectively prevent a sustaining water column being formed in the upper portion of conduit 27, 270.

It should be understood that conduit 27, 270 makes an air and fluid tight seal with the top and bottom walls 66 and 67 of casing 60, and with diaphragm 35. Such a seal may be accomplished by any suitable means, such as solder or the like.

Fig. 4 discloses generally similar means for preventing the return of water from reservoir 28 for forming a fresh water compensating column within conduit 27. A gravity seated check ball 72 of suitable non-corroding material such as bronze or the like, is adapted to cooperate with a suitable valve seat 73, which may be provided at or about the end of conduit 27 as shown. Conduit 27 will normally be empty of water except for a column the weight of which equals the weight of said check ball. Any fluid pressure established within chamber 28 is precluded from being transmitted through conduit 27 by reason of the seal formed by ball 72 on its seat. It should be understood that the means just described is housed within fresh water reservoir 28, below diaphragm 35, as shown. A suitable housing, basket or guard 74 is provided to prevent displacement of valve ball 72 to assure intended co-operation thereof with its seat. It should be

further understood, that the proportions shown in Fig. 4, are greatly exaggerated for clarity of detail, since in the preferred embodiment of the means disclosed in Fig. 4, leg 75 is as short as possible, whereby the open or discharge end of conduit 27 will be as close to bottom 71 of reservoir 28, as practicable. The basket 74 may have ports 740 near its lower end and a suitable pin 741 at its upper end. The pin precludes displacement of valve 72.

Each of the means hereinabove disclosed will prevent or limit the height to which a column of fresh water from reservoir 28 may rise within conduit 27, 270 under any condition wherein there is back water under low pressure in the sewer system, to such extent as to enter the air chamber 29. The drain 37 is adapted to vent to the atmosphere at or about ground level as shown by means of the overflow pipe or branch pipe 370.

It should be understood that bowl 38 may be drained by means of a separate drain 37, which may have a drain box or vent interposed intermediate its length, at approximately ground level, such as drain box 39, disclosed and fully detailed in said Bart et al. application.

The terms fresh water and pure water, as used herein, are synonymous and refer to water supplied to the device via supply pipe 12. Such water is pure or fresh, for the purpose of the present application, until it is ejected from nozzle 190 or if not so ejected, until it has passed over the overflow wall 70 of the reservoir 28.

From the foregoing, it is apparent that I have provided secondary means intermediate the length of the pure water conduit 27, 270 for effectively limiting the quantity of water which may be displaced from pure water reservoir 28 regardless of pressure conditions in air seal chamber 29. The air cell 29, water reservoir 28 and conduit or drain passage providing means; viz., 26, 27 and 270, constitute a primary sealing means for preventing flow of sewage to the valve chamber 25. It is to be understood that the cubic volume of reservoir 28 exceeds the cubic volume of the tubes, pipes and chambers 24, 25, 26, 27, 50, and 270, and that the cubic content of air cell 29 in turn exceeds the cubic content of the reservoir 28, all as explained in said copending applications.

What is claimed is:

1. A device of the class described for controlling flow of potable water and using potable water for preventing contamination of such flow of potable water, comprising a water supply nozzle, a chambered valve carrying supply line for receiving water at its lower end from said nozzle and for discharging water at its upper end at an elevation above ground level, and comprising a valve for cooperation with said nozzle for controlling flow of water from said nozzle to the upper end of said

water supply line, means for actuating said valve to open and closed positions, means for draining the chamber and water supply line when the valve is closed and comprising a conduit connected with said chamber, an air chamber sealed at its top and having its lower end in communication with a sewer, a water trap wholly disposed within said air chamber, said conduit terminating interiorly of and adjacent the lower portion of said water trap, said water trap having an overflow wall connecting the trap with the air chamber at the top of the air chamber whereby to prevent a relatively low level of water in the air chamber from flowing from said air chamber into said water trap, and means disposed intermediate the length of said conduit for limiting the quantity of water displaced from said water trap into said conduit incident to back sewage operative upon the air cell and thereby creating a pressure condition within the cell and tending to force water in the trap to a higher elevation in said conduit, whereby sewage is precluded from overflowing the air cell and from rising through the trap and conduit to elevations above the water supply nozzle and valve and thereby contaminate any water intended for discharge by the water supply line at an elevation above ground level.

2. A device of the class described comprising a water supply nozzle, a chambered valve carrying supply line for receiving water at its lower end from said nozzle and for discharging water at its upper end at an elevation above ground level, and comprising a valve for cooperation with said nozzle for controlling flow of water from said nozzle to the upper end of said water supply line, means for actuating said valve to open and closed positions, means for draining the chamber and water supply line when the valve is closed and comprising a conduit connected with said chamber, a water trap in said conduit having an overflow wall and means for providing an air pocket adjoining said trap having connection at its top with the overflow wall for escape of fluid over said overflow wall through said air pocket, means communicating with said air pocket at the lower portion thereof for relieving tendency toward low pressure conditions, and means disposed in said conduit between said trap and said chamber for sealing said conduit against return passage of water from said water trap to said chamber and water supply line, whereby any tendency of waste fluids to pass in reverse direction of normal flow of fluid from said valve chamber through said conduit is checked so as to protect said valve chamber against contamination from waste material.

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