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H. WIRZ, JR., ET AL

1,951,463

SEWER FLUSHING APPARATUS

Filed May 28, 1932

FIG. 1

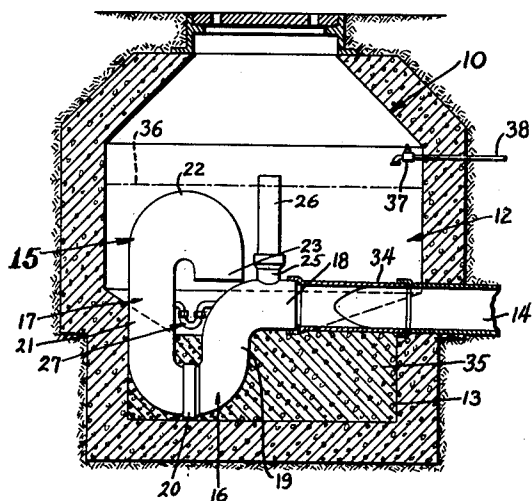


FIG. 2

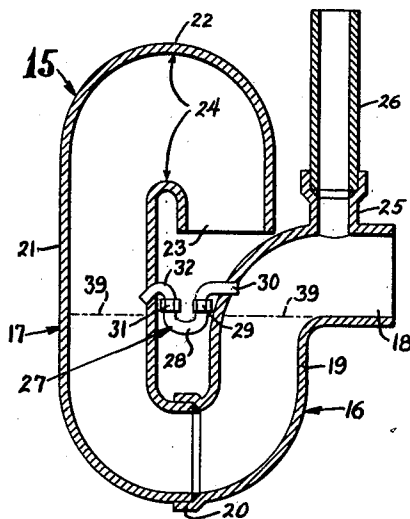


FIG. 3

FIG. 4

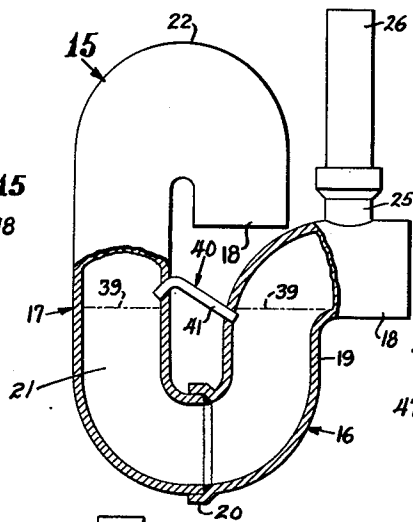
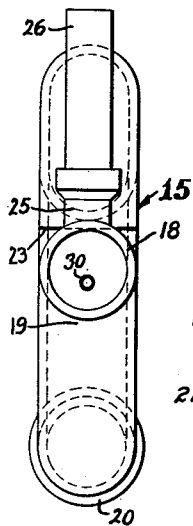


FIG. 5

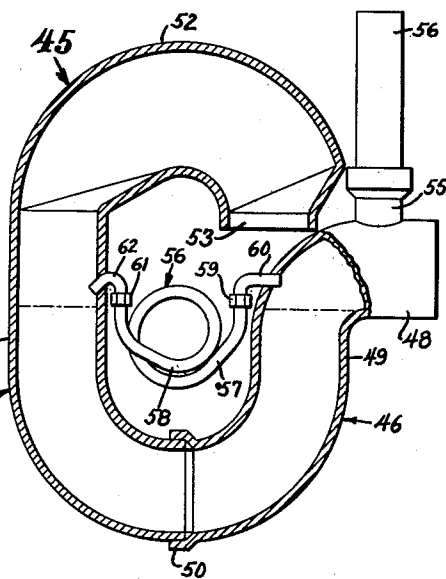
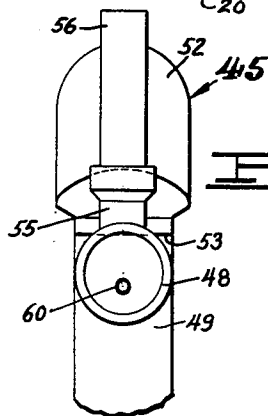


FIG. 6



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1,951,463

SEWER FLUSHING APPARATUS

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3 Claims. (Cl. 137-106)

This invention relates to improvements in sewer flushing apparatus.

The general object of the invention is to provide an improved automatic apparatus for flushing main sewers with fresh water.

Another object of the invention is to provide an automatic sewer flushing apparatus including a water reservoir in which fresh water is run until the water level in the reservoir reaches a predetermined level whereupon the water is siphoned from the reservoir and directed into a main sewer.

A further object of the invention is to provide novel means for controlling the action of a siphon used in a sewer flushing apparatus.

A still further object of the invention is to provide a siphon for use in a sewer flushing apparatus which is without mechanically operated means for controlling the action of the siphon.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a vertical section through a sewer flushing reservoir showing our improved flushing apparatus operatively installed therein.

Fig. 2 is an enlarged vertical section through our improved sewer flushing siphon.

Fig. 3 is an end view of the device shown in Fig. 2.

Fig. 4 is a view similar to Fig. 2 showing a modified siphon action control means.

Fig. 5 is a vertical section through a further modified form of sewer flushing siphon and

Fig. 6 is a fragmentary end view of the device shown Fig. 5.

Referring to the drawing by reference characters we have indicated a tank generally at 10. As shown the tank is constructed of concrete and includes a water reservoir portion 12 and a well portion 13. A pipe 14 which communicates with the main sewer (not shown) opens from the tank adjacent the juncture of the reservoir portion 12 and the well 13.

Our improved siphon device is indicated generally at 15 and is shown in detail in Figs. 2 and 3. The device 15 may be made of clay and includes a goose neck portion 16 and a main portion 17. The goose neck portion 16 includes a horizontal outlet section 18 which curves downwardly into a vertical section 19 which in turn curves away from the section 18 where it is provided with a connection bell 20. The main portion 17 of the siphon includes a vertical section 21 which adjacent the lower end curves toward

the portion 16 and is positioned in the connection bell 20 and cemented thereto. Adjacent the upper end the vertical section 21 makes a complete half circle towards the portion 16 as at 22 and terminates in a vertical entrance section 23. The lower end of the inlet section 23 is preferably approximately on the same plane as the upper surface of the interior of the outlet section 18.

The portions 16 and 17 of the siphon device 15 are preferably made of clay pipe and the sections 18, 19, 21 and 23 are preferably all of the same interior cross sectional area or diameter while the interior of the curved section 22 is preferably of a greater height or cross sectional area as indicated at 24. Adjacent the outlet 18 of the portion 16, we provide a reduced connector portion 25 in which a length of vertical clay pipe 26 is positioned and secured thereto by cementing.

For controlling the action of the siphon device 15 we provide a control device indicated generally at 27. As shown the control device 27 includes a U-shaped section of pipe 28 which may be made of metal and is secured at one end by a union 29 to an elbow pipe fitting 30 and at the opposite end is secured by a union 31 to a curved pipe fitting 32. The elbow pipe fitting 30 opens into the siphon portion 16 a predetermined distance above the lower surface of the interior of the outlet section 18 and the curved pipe fitting 32 enters the siphon section 21 on the same plane and opens into the section 21 at a downward inclination.

In operation the siphon device 15 is positioned in the well 13 and the outlet section 18 connected with the pipe 14. As shown in Fig. 1 the outlet section 18 of the siphon 15 is connected with the pipe 14 through the medium of a clean out Y device 34 such as shown in our copending application Ser. No. 595,925 filed Feb. 29, 1932. It will be understood however that the clean out Y device 34 may be omitted and the outlet section 18 of the siphon device connected directly to the pipe 14 if desired.

After the siphon device 15 has been operatively connected to the pipe 14 the well 13 is preferably filled with cement as indicated at 35. When the siphon device 15 is thus operatively installed in the tank 10 the upper end of the vent pipe 26 extends upward a predetermined distance above the normal high water level in the tank which is indicated by the broken line 36 in Fig. 1.

For filling the reservoir 12 with water we have shown a standard type of metering valve 37 such as is now commonly used in sewer flushing devices

and which is connected to a suitable source of fresh water supply by a pipe 38. In operation the metering valve 37 is opened sufficiently to allow a predetermined amount of water to flow into the reservoir 12 in a given length of time.

In operation the sections 19 and 21 of the siphon are filled with water up to the level of the bottom of the interior of the outlet section 15 as indicated by the broken line 39 in Fig. 2 and the control device 27 is filled with water. As the level of the water in the reservoir rises it enters the inlet section 23. Thereafter as the water level raises the air in the siphon between the water level at the inlet 23 and the water level 39 is compressed. As the air continues to be compressed it forces the water in the control device 27 out through the elbow fitting 30 into the outlet section 18 whereupon the water level in the inlet 23 rises above the lower surface of the section 22 and flows into the vertical section 21. When the water reaches the fitting 32 the air is completely evacuated and the control 27 is resealed thus insuring that the siphon action will not be broken. This also assures that the siphon will not be air bound so that a perfect action is assured. The water passes through parts 27 and 16 at the same time and when the action ceases 27 and 16 remain full for the next operation. From the portion 15 the water passes out through the outlet 18 and through the Y clean out device 34 into the pipe 14.

The amount of water contained in the control device is sufficient to allow the water in the reservoir 12 to rise to the level indicated at 36 before the pressure of the air in the siphon is sufficient to force water out of the control device. The speed with which the water rushes through the outlet 18 draws air downward through the vent pipe 26 and this air is drawn into the sewer with the water. Thus every time the flushing device operates a supply of fresh air is admitted to the sewer thereby diluting the gases formed in the sewer and lessening the danger of severe gas explosions. When the siphon device 15 is not actuating to flush the sewer, gases formed in the main sewer can back up through the pipes 14 and 34 and pass out through the vent pipe 26.

In Fig. 4 we have indicated a modified form of control device generally at 40. As shown the control device 40 comprises a length of pipe 41 which enters the siphon portion 16 at a predetermined distance below the lower surface of the interior of the outlet section 18. The pipe 41 inclines upwardly towards the vertical section 21 and curves downwardly and enters the section 21 at a downward inclination a predetermined distance above the water level 39.

When the control device 40 is used the water level in the reservoir rises until the compressed air in the siphons is sufficient to force air out through pipe 41 against weight of the water in the portion 16 above the lower end of the pipe thus relieving the air pressure in the portion 17 whereupon the water rushes from the reservoir 12 into the siphon and thence into the pipe 14 as previously described.

In Figs. 5 and 6 we have indicated a modified form of siphon device generally at 45. The device 45 includes a goose neck portion 46 similar to the portion 16 of the device 15, and a main portion 47. The goose neck portion 46 includes a horizontal outlet section 48 which curves downwardly into a vertical section 49 which in turn curves away from the section 48 where it is provided with a connection bell 50. The main por-

tion 47 of the siphon includes a vertical section 51 which adjacent the lower end curves towards the portion 46 and is positioned in the connection bell 50 and cemented thereto. Adjacent the upper end the vertical section 51 makes a substantially complete half curve as at 52 towards the section 46 and terminates in a vertical entrance section 53. The lower end of the inlet section 53 is preferably approximately on the same plane as the upper surface of the interior of the outlet section 48. The portions 46 and 47 of the siphon device 45 like the portions 16 and 17 of the siphon device 15 are preferably made of clay pipe and the sections 48, 49, 51 and 53 are preferably all of the same cross-sectional area or interior diameter while the interior of the curved section 52 is preferably of a greater cross-sectional area or diameter.

Adjacent the outlet 48 of the portion 46 we provide a reduced connector portion 55 in which a length of vertical clay pipe 56 is positioned and secured thereto by cement. For controlling the action of the siphon device 45 we provide a control device indicated generally at 56. As shown the control device 56 comprises a length of pipe 57 formed into one complete coil intermediate its length as indicated at 58. One end of the pipe 57 is secured by a union 59 to an elbow pipe fitting 60 and the opposite end is secured by a union 61 to a curved pipe fitting 62. The elbow pipe fitting 60 like the elbow pipe fitting 30 of the device 15 opens into the siphon portion 46 a predetermined distance above the lower surface of the interior of the outlet section 48 and the curved pipe fitting 62 like the curved pipe fitting 32 of the device 15 enters the siphon section 51 on the same plane and opens into the section 51 at a downward inclination. The operation of the siphon device 45 is similar in all respects to the operation of the siphon device 15.

From the foregoing description it will be apparent that we have provided a novel sewer flushing device which is simple in construction and highly efficient in use.

Having thus described our invention, we claim:

1. In a sewer flushing device, a water reservoir, a pipe positioned adjacent the bottom of said reservoir and communicating with a sewer, means to conduct water from said reservoir to said pipe, said means comprising a siphon device, said siphon including a horizontal outlet section communicating with said pipe, said outlet section being curved downwardly and thence upwardly into a vertical section, the upper end of said vertical section being curved towards said outlet and terminating in a vertical inlet section, the lower end of said inlet section being approximately on the same plane as the upper inner surface of said outlet section, the interior area of said last mentioned curved section being greater than that of said other sections, a hollow conduit member, one end of said conduit opening into said outlet section above the lower inner surface of said outlet section and the opposite end of said conduit opening into said first vertical section above the lower inner surface of said outlet section, an intermediate section of said conduit being bent downwardly to a point below the ends thereof and a vent conduit, said vent conduit opening into said outlet section and extending upwardly thereby therefrom to a point above said last mentioned curved section.

2. In a sewer flushing device, a reservoir, a pipe positioned adjacent the bottom of said reservoir and communicating with a sewer, means to

conduct water from said reservoir to said pipe, said means comprising a siphon device, said siphon including an outlet section communicating with said pipe, said outlet section being curved downwardly and thence upwardly into a vertical section, the upper end of said vertical section being curved towards said outlet and terminating in a vertical inlet section, the lower end of said inlet section being approximately on the same plane as the upper inner surface of said outlet section, the interior area of said last mentioned curved section being greater than that of said other sections, and a hollow conduit member, one end of said conduit opening into said outlet section above the lower inner surface of said outlet section and the opposite end of said conduit opening into said first vertical section above the lower inner surface of said outlet section, an intermediate section of said conduit being bent downwardly to a point below the ends thereof.

3. In a sewer flushing device, a water reservoir, a pipe positioned adjacent the bottom of said reservoir and communicating with a sewer,

means to conduct water from said reservoir to said pipe, said means including a siphon device, said siphon device including a horizontal outlet portion communicating directly with said pipe, said horizontal portion being continued directly downward and thence upward to form a U-shaped portion with spaced upwardly directed legs, the upper end of one leg of said U terminating in an inverted U-shaped inlet section having an open end, and a conduit member, one end of said conduit member being inclined downward and in communication with the inlet side of the first mentioned U-shaped member at a point above the level of the lower inner surface at said outlet portion, the other end of said conduit member opening into the outlet side of said U-shaped member substantially in line with and being directed towards the said pipe communicating with the sewer, said conduit member including a portion normally water sealed.

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