

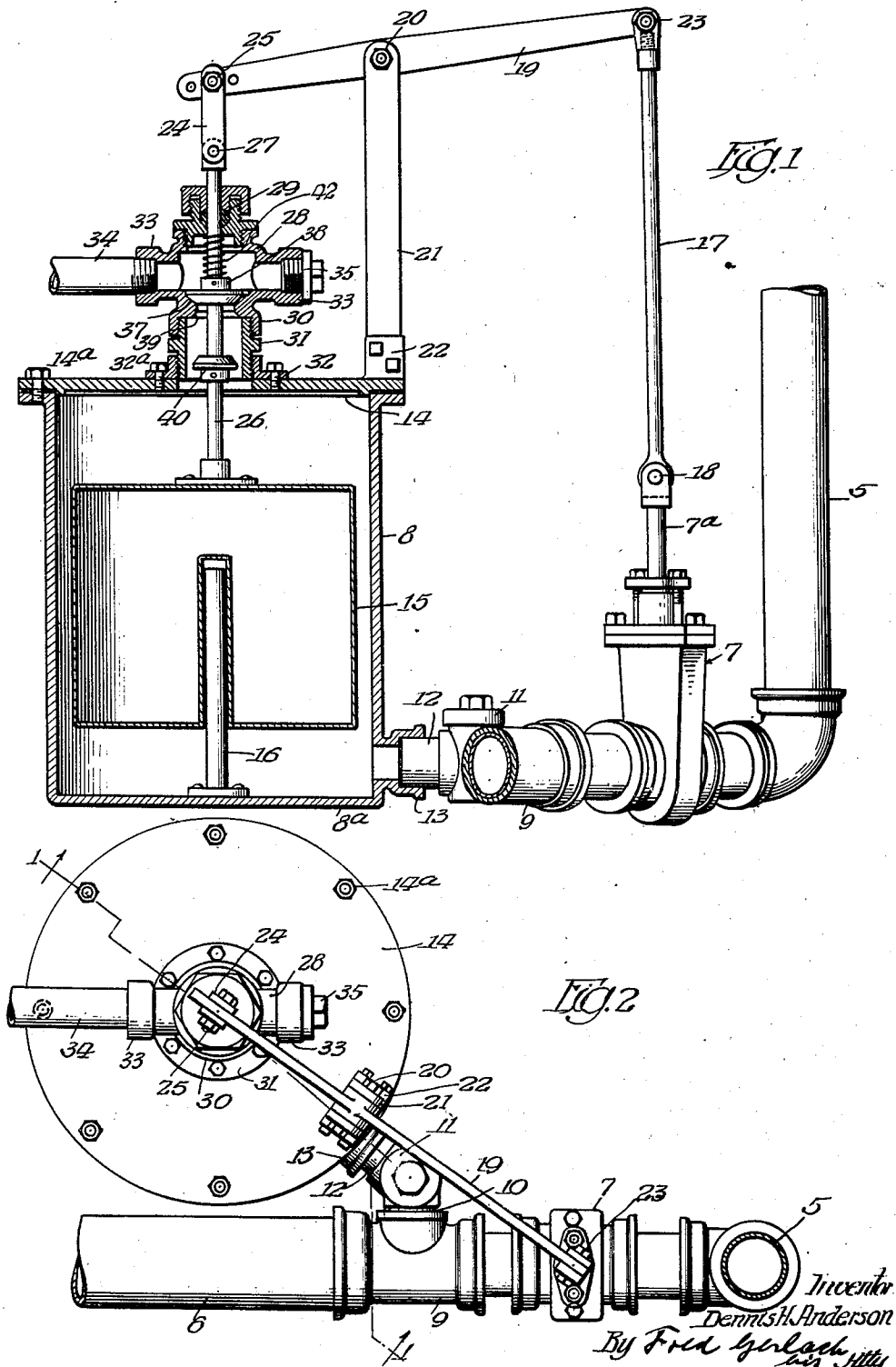
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BACKWATER CONTROL FOR SEWER

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BACKWATER CONTROL FOR SEWERS

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The invention relates to backwater control apparatus for sewers.

One object of the invention is to provide improved apparatus for preventing backflow of water from a sewer to provide for venting the basin containing the float which closes the backflow valve in the line leading to the sewer in order to permit the operation of the float responsively to any backwater in the basin, and preventing the escape of air or gases from the sewer through the basin except when necessary for the operation of the float.

Another object of the invention is to provide apparatus for preventing water from a sewer from backing into a conduit leading to the sewer from a building, which is simple in construction and efficient in operation.

Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing: Fig. 1 is a vertical section taken on line 1-1 of Fig. 2 of apparatus embodying the invention. Fig. 2 is a plan.

The invention is exemplified in apparatus with the usual waste pipe 5 for conducting the waste to a pipe 6 which leads to the sewer, and a gate-valve 7 between waste pipe 5 and sewer pipe 6 for preventing backflow from the sewer.

A basin or tank 8 is connected to receive fluid from pipe 6 by a T-fitting 9 which is included in pipe 6, a short pipe section 10 connected to fitting 9, a cleanout fitting 11, and a pipe section 12 which is connected to a boss 13 leading to the lower portion of the basin 8. Basin 8 has a cylindrical side wall, a bottom wall 8^a and a top 14 removably secured to the flanged upper end of basin 8 by screws 14^a. A float 15 in basin 8 is guided vertically by an upstanding stem 16 which is secured to the bottom wall 8^a of the basin and fits in a tubular guide 8^b in the float. Normally, the float 15 is in its lower position in the basin, as shown in Fig. 1, so that the float will not be lifted by waste flowing through pipe 6. When stoppage occurs in sewer pipe 6, the waste will flow through fitting 9, pipe 10, fitting 11, and pipe 12 into the lower portion of basin 8 and cause the float to rise so it will function to close the valve 7.

The operating connection between float 15 and the slidable stem 7^a of valve 7 comprises a vertical link 17, the lower end of which is pivoted at 18 to the upper end of stem 7^a; a lever 19 which

is centrally fulcrumed on a pivot 20 which is supported at the upper end of a standard or bracket 21 which has its lower end fixedly secured to a lug 22 on the basin top 14 and has the outer end of one of its arms pivotally connected at 23 to the upper end of link 17; a link 24 pivoted at 25 to the outer end of the other arm of lever 19; and a stem 26, which has its lower end fixed to the top of float 15 and its upper end pivoted, as at 27, to the lower end of link 24. This exemplifies a simple and efficient operating connection for operating valve 7 with a slidable gate and stem.

The top 14 has an opening therein and a nipple 32 is secured in a flanged ring 32^a. A valve-casing 28 has a downwardly extending branch which is screw-threaded to the upper end of nipple 32 which is fixedly secured on the top of cover 14. Stem 26 extends through nipple 32, valve casing 28 and a packing box 29 in the upper end of said casing. Casing 28 has a pair of laterally and oppositely extending members 33 to one of which a vent pipe 34 is connected. A screw plug 35 closes the other member 33. Two of these extensions are provided so that the pipe 34 can be connected so as to extend from either side of the fitting for convenience in installing the vent pipe. The latter is usually extended to a sufficient elevation and outside of the building so that any gases from the sewer will not be delivered into the building.

In these installations it is desirable to prevent gases from the waste passing to the sewer and through the basin 8 from passing to the vent pipe 34, both when the pipe 6 is carrying off the waste and also when backwater from the sewer lifts the float 15 to close valve 7. For this purpose, casing 28 is provided with an upwardly facing seat 37 for a valve 38 which is fixed to the stem 26 of float 15 and is adapted to close communication between the chamber in basin 8 and the vent pipe 34 when the float is in its lowered position and the waste is being carried off by the sewer pipe. Casing 28 is also provided with a downwardly facing seat 39 for a valve 40 which is also fixed to stem 26 and is adapted to engage said seat to cut off communication between the chamber in basin 8 and vent pipe 34 when the float has closed valve 7 and has been lifted by backwater in the basin. These valves serve to prevent gases in tank 8 from escaping to vent pipe 34 when the float is either in its lowered or raised positions and also prevent water in basin 8 from passing to said pipe in the event that the backwater is sufficient to overflow tank 8. A light spring 42 in casing 28 is applied to stem 26 to

insure the lowering of the float and the opening of valve 7 if the weight of the float and its stem is insufficient. During the movements of the float between its raised and lowered positions, the chamber in basin 8 will be placed in communication with vent pipe 34 but the basin will be closed when the float is either in its raised or lowered position. In the operation of float 15 it is necessary to provide for the escape of air from basin 8 in order to permit the float 15 to be freely lifted by the backwater. As soon as the float 15 rises from its normal or lowered position, valve 33 will move away from its seat 37 and permit the air to escape from the chamber in basin 8 to vent pipe 34 until the valve 7 has been closed by the float. When the float has been lifted, valve 40 will engage seat 39 and close the chamber in the basin. When the backwater flows out of basin 8, valve 40 will leave its seat 39 and permit air to enter the chamber in basin 8 from pipe 34 until it is again lowered and valve 33 engages seat 37. This provides for opening the basin so the operation of the float 15 by the backwater will not be interfered with by air pressure or suction and also provides for closing the chamber in the basin so that no gases will escape therefrom when the float 15 is in its normal or raised positions.

Link 24 is provided with a series of holes and lever 19 is also provided with a series of holes for the adjustment of pivot pin 25 so that lever 19 and link 17 may be adjusted to vary the stroke of valve stem 7^a. Link 17 is screw-threaded at its upper end into a sleeve 17^a so that the valve 7 may be properly timed to close. Valves 38 and 40 may also be adjustably secured by set-screws to stem 26 to time the seating of said valves.

When the sewer pipe 6 is carrying off the waste, float 15 will be in its lowered position, as illustrated in Fig. 1, and gate-valve 7 will be open. Valve 38 will then prevent the escape of gases from the chamber in basin 8. If the sewer pipe 6 fails to carry off waste, the backwater will enter into the lower portion of the basin from fitting 9 and lift the float 15. The upward movement of the float will lift stem 26 and link 24 to rock lever 19 and lower link 17 to close the gate-valve 7 and prevent backwater from flowing upwardly through pipe 5. During the upward movement of the float, valve 38 will be unseated and permit air to escape from basin 8. When valve 7 has been closed, valve 40 will close against seat 39 and prevent gases from escaping from the basin 8.

The invention exemplifies a backwater control apparatus for sewers, which is simple in construction and efficient in operation. The invention also exemplifies apparatus of this type which includes valve means for opening to atmosphere the basin containing the float for the free operation of the float and which closes the basin to prevent escape of gases both when the float is in its lowered position and also when it has been lifted and the basin 8 contains backwater.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver

waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin provided with an opening in its top, a float in the basin, a slidable stem extending through the opening and having its inner end connected to the float, an operating connection between the backflow valve and the stem of the float for closing the backflow valve when the float is raised by backwater from the sewage pipe, and a valve on the stem of the float for closing the opening in the basin when the float has been lifted by backwater.

2. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin provided with an opening in its top, a float in the basin, a slidable stem extending through the opening and having its inner end connected to the float, an operating connection between the backflow valve and the stem of the float for closing the backflow valve when the float is raised by backwater from the sewage pipe, and a valve on the stem on the float for closing the opening in the basin when the float has been lowered and the backflow valve is open.

3. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin provided with an opening in its top, a float in the basin, a slidable stem extending through the opening and having its inner end connected to the float, an operating connection between the backflow valve and the stem of the float for closing the backflow valve when the float is raised by backwater from the sewage pipe, and valve-means on the stem of the float for closing the opening in the basin when the float has been lifted by backwater and when the float has been lowered and the backflow valve is open.

4. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin provided with an opening in its top, a float in the basin, a valve-casing on top of the casing, a slidable stem extending through the opening and the casing and having its inner end connected to the float, an operating connection between the backflow valve and the upper end of the stem of the float for closing the backflow valve when the float is raised by backwater from the sewage pipe, and a valve on the stem of the float for closing the opening in the basin when the float has been lifted by backwater.

5. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin provided with an opening in its top, a float in the basin, a valve-casing on top of the casing, a slidable stem extending through the opening and the casing and having its inner end connected to the float, an operating connection between the backflow valve and the upper end of the stem of the float for closing the backflow valve when the float is raised by backwater from the sewage pipe, and a valve on the stem of the float for closing the opening in

the basin when the float has been lowered in the basin and the backflow valve is open.

6. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin connected to receive fluid from the sewage pipe, a float in the basin, a valve casing on the top of the basin and over said opening, a slidable stem extending through the opening and said casing and having its inner end connected to the float, a valve on said stem for closing said opening, a standard on the tank, a lever centrally fulcrumed in the standard and having one of its ends connected to the stem of the float, and a link between the backflow valve and the other end of said lever.

7. In backwater control apparatus, the combination with a sewage pipe, a waste pipe leading from a building and connected to deliver waste to the sewage pipe, and a valve for preventing backflow from the sewage pipe to the waste pipe, of a basin connected to receive fluid from the sewage pipe, a float in the basin, a valve casing over said opening and on top of the basin, a slidable stem extending through the opening and having its inner end connected to the float, valves on said stem for closing said opening when the float has been raised and when it has been lowered, a standard on the tank, a lever centrally fulcrumed in the standard and having one of its ends connected to the stem of the float, and a link between the backflow valve and the other end of said lever.

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