B. T. VERNON.

BACKWATER VALVE FOR SEWER PIPES.

APPLICATION FILED MAY 15, 1915.

1,187,683. Patented June 20, 1916.

Fig. 1

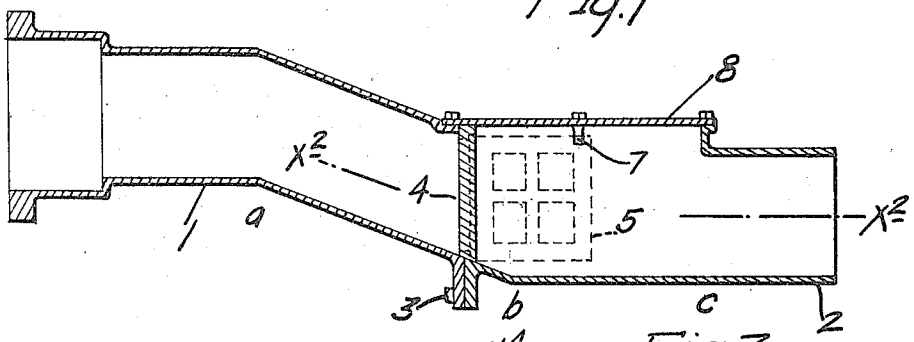


Fig. 2

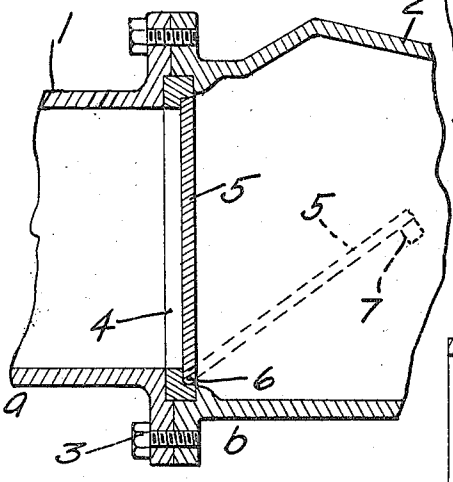


Fig. 3

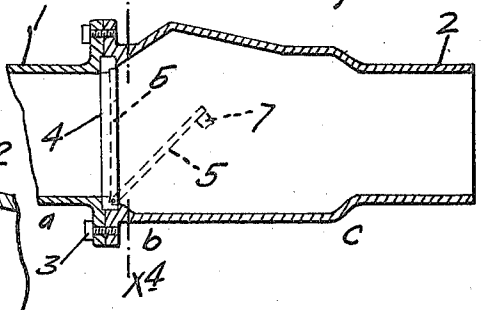
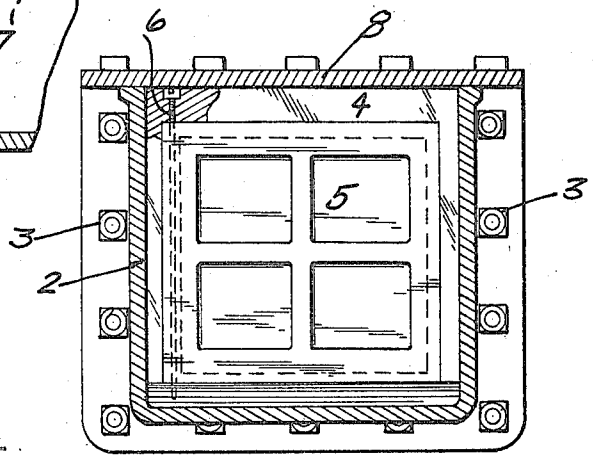


Fig. 4



WITNESSES

E. C. Skinkle

H. O. Kilgore

INVENTOR

Bert T. Vernon

BY HIS ATTORNEYS

Williamson & Merchant

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BERT T. VERNON, OF MINNEAPOLIS, MINNESOTA.

BACKWATER-VALVE FOR SEWER-PIPES.

1,187,683. Specification of Letters Patent. Patented June 20, 1916.

Application filed May 15, 1915. Serial No. 28,424.

To all whom it may concern:

Be it known that I, BERT T. VERNON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Backwater-Valves for Sewer-Pipes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved back water valve for sewer pipes, and to such ends, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

These back water valves are intended for application in the sewer pipes leading from the sewer mains to houses or buildings, and the purpose thereof is to prevent flooded sewers from backing up into the basements and flooding the same. Hitherto, these backwater valves have been normally held yieldingly closed, usually by gravity and adapted to open to permit the sewage to run from the house or building to the main sewer line but to check a back or reverse flow. They were subject to the serious objections that, as they were normally closed, they would not, under normal conditions, permit circulation of air required for ventilation.

My invention provides a back water valve which normally stands open so as to permit free ventilation, to which, under a back flow of water from the flooded sewer, will close and prevent the flooded water from entering the basement.

This improved back water valve, which includes certain other important minor features, is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings: Figure 1 is a vertical section taken centrally through a portion of a sewer pipe which leads from a main or straight sewer pipe into the basement of a house or building; Fig. 2 is a horizontal section taken on the line x^2 x^2 on Fig. 1; Fig. 3 is a view corresponding to Fig. 2 but showing the valve supporting frame in full; and Fig. 4 is a vertical section taken on the line x^4 x^4 on Fig. 3.

The said sewer pipe which leads from the street or main sewer into the basement is, as shown, made up of two sections 1 and 2 having abutting flanges connected with water-tight joints and clamped together by screws 3. The pipe sections 1 and 2, near their ends, are preferably made round in cross section, but are made rectangular in the vicinity of the connected flanged ends thereof, and are preferably made approximately rectangular from points marked *a* and points marked *c* on Fig. 1. From point *a* and point *b*, the bottom portion of the pipe is flat and inclined to a very considerable extent, and the flat bottom of said pipe is also preferably slightly inclined in the same direction from point *b* to point *c*. The vertical sides and horizontal top of the abutting end portions of the pipe sections 1 and 2 are recessed so as to receive the vertical and top portions of a rectangular three-sided frame 4. This frame 4 has no bottom and the lower ends of its sides are beveled to fit the inclined bottom of the sewer pipe. The frame 4 is rabbeted so that it receives and closely fits the edge of a rectangular valve or gate 5. This valve, at one edge, is hinged to one side of the frame 4 by a vertically disposed hinge bolt 6 passed through the top of said frame, through one edge of the valve and down into a seat in the inclined bottom of the sewer pipe. The valve or gate 5 is thus mounted to swing on a vertical pivot, and hence, will be frictionally held in whatever position it may happen to be left, but will be freely moved by the slightest flow of water through the sewer pipe in either direction. This opening movement is limited by a stop lug 7 shown as applied to a removable closure plate 8 that is bolted to and tightly closes a larger opening formed in the top of the pipe section 2 in the vicinity of the valve 5. This stop limits the opening movement of the valve to approximately the position indicated by dotted lines in Figs. 1, 2 and 3, and stops the valve in such position that it will be moved and closed by a very slight movement of water from the pipe section 2 toward the pipe section 1. Here, it may be stated that the said pipe section 1 extends into the basement while the pipe section 2 extends to the street or main sewer pipe. It will thus be seen that the valve 5 will

always freely open to permit the usual discharge of sewage from the house or building, will normally remain in an open position so as to afford free air circulation and ventilation, and will be closed by the initial back flow of sewage or water from the street main. The inclined bottom of the sewer pipe in the vicinity of the valve insures the clean washing of all solid or refuse matter through the sewer pipe to points out of the line of movement of the valve.

It is highly important to note that the swinging movement of the valve 5 does not raise and lower the same, so that the said valve is always exposed to the back flow of a very slight amount of water through the sewer pipe. A valve hinged at its top, for example, would not only close by gravity and normally remain closed, but if normally sustained in an elevated position, would not be acted upon by a back flow of water unless the sewer pipe should be nearly or quite filled with water.

When the stopper plate 8 is removed, access is afforded to the interior of the pipe and to the valve 5. Also, it is important to note that the pipe 2, near the valve 5 is widened so that when the valve is against the stop 7, ample room is left between the valve and the bulged side wall of the said pipe for the desired flow of sewage from the building to the street sewer.

What I claim is:

1. The combination with a sewer pipe, of a back flow check valve freely mounted on a vertical pivot, so that it will normally stand in whatever position it may be set until acted upon by a flow of fluid in the one direction or the other through said pipe, but free for movements in the one direction or the other under the flow of fluid through said pipe.

2. The combination with a sewer pipe, of a back flow check valve therein mounted on a vertical pivot so that it will normally stand in whatever position it may be set until acted upon by a flow of fluid in the one direction or the other through said pipe, and a stop limiting the opening movement of said valve to a position that is oblique to the line of movement of the fluid through said pipe.

3. The combination with a sewer pipe made up of two sections detachably connected, of a valve supporting frame seated in and held between the abutting end portions of said pipe sections, and a back flow valve hinged at one vertical edge to one vertical side of said frame so that it will normally stand in any position in which it may be set until acted upon by a flow in the one direction or the other through said pipe.

4. The combination with a sewer pipe, of a back flow check valve mounted on a vertical pivot, so that it will normally stand in whatever position it may be set until acted upon by a flow of fluid in the one direction or the other through said pipe, and a stopper within said pipe limiting the opening movement of said valve to a position less than ninety degrees from its closed position.

5. The combination with a sewer pipe comprising two detachably connected sections, of a rectangular frame comprising a horizontal top and vertical side portions, seated in and secured between the abutting ends of said pipe sections, and a back flow valve hinged at one edge to one side of said frame by a vertical pivot and arranged to stand in any position in which it may be set until acted upon by a flow in the one direction or the other through said pipe.

6. The combination with a sewer pipe, of a back flow check valve mounted on a vertical pivot, so it will normally stand in whatever position it may be set until acted upon by a flow of fluid in the one direction or the other through the said pipe, the said pipe having a flat inclined bottom portion extended on both sides of said valve.

7. The combination with a sewer pipe comprising two detachably connected sections, of a rectangular frame comprising a horizontal top and vertical side portions seated in and secured between the abutting ends of said pipe sections, and a back flow valve hinged at one edge to one side of said frame by a vertical pivot and arranged to stand in any position in which it may be set until acted upon by a flow in the one direction or the other through said pipe, said pipe having a flat inclined bottom extended on both sides of said valve.

8. The combination with a sewer pipe, of a back flow check valve mounted in said pipe and comprising a marginal frame and a valve proper connected to one side of said frame by a free vertical pivot, whereby the said valve will normally stand in whatever position it may be set until acted upon by a flow of fluid in the one direction or the other through said pipe, but free for movement in either direction when acted upon by the flow of fluid through said pipe.

In testimony whereof I affix my signature in presence of two witnesses.

BERT T. VERNON.

Witnesses:

HARRY D. KILGORE,

F. D. MERCHANT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."