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BACK PRESSURE VALVE FOR DRAINAGE SYSTEMS

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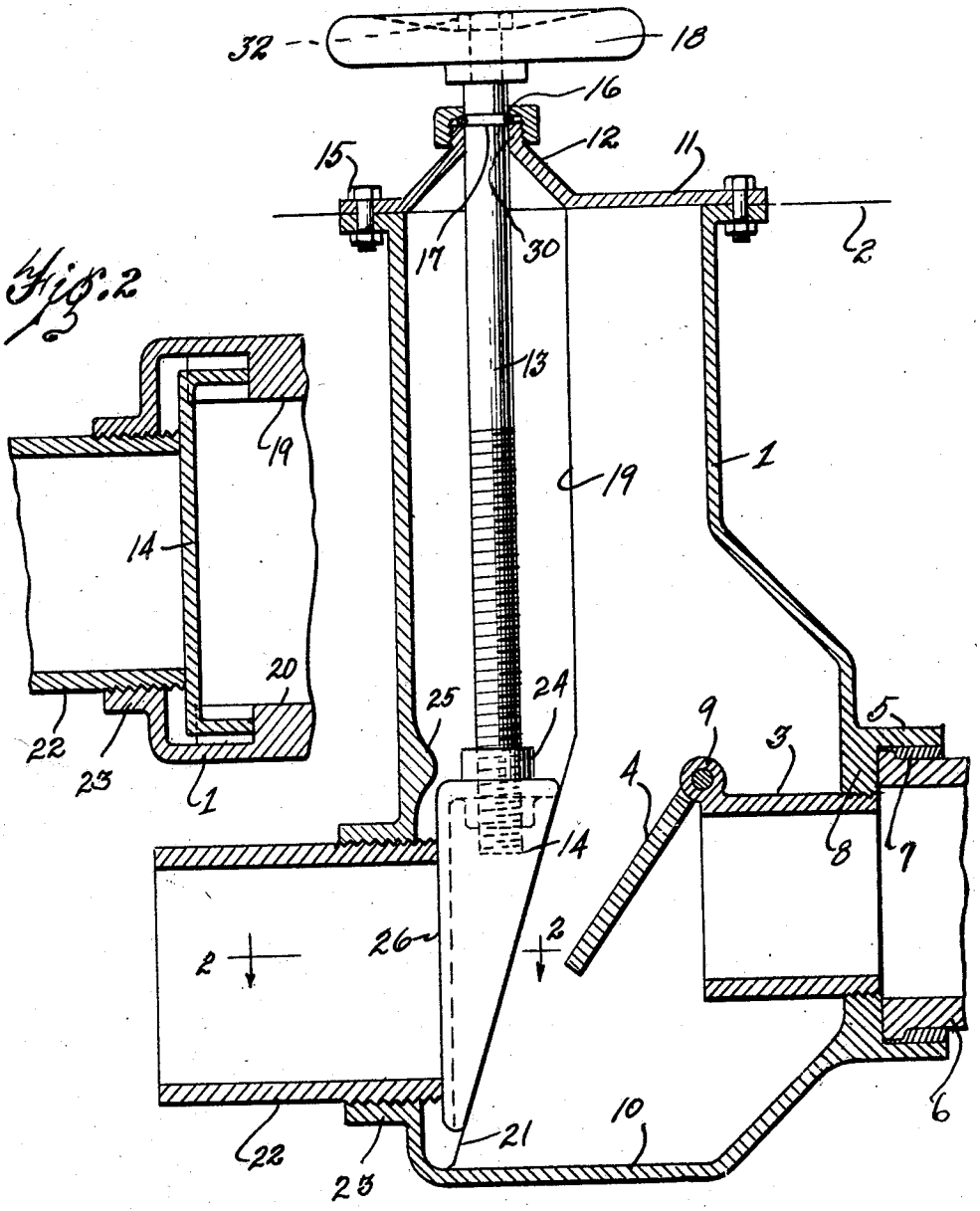


Fig. 2

Fig. 1

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BACK-PRESSURE VALVE FOR DRAINAGE SYSTEMS

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This invention relates to a fitting for sewage conduits, and the object of the invention is to provide a simple and comparatively inexpensive device for introduction in a sewage line having means adapted on back flow into the sewage line to close the portion of the line connected with the inlet or drain. It is further provided with a manually operable valve by which the outlet line may be positively closed in the event the back flow is not prevented by the first named means with which the apparatus is provided.

The invention seeks to embody in a single unit an automatically operating valve for closing the inlet conduit through back flow in the sewage line and in conjunction with which is provided a positive means for closing the sewage line to the device.

Heretofore, with devices of this nature an ordinary swing valve is used in a chamber, the outlet of which is connected with a sewer and to the inlet of which a swing valve is applied, the inlet being connected with a drain from a building. Such devices heretofore in use in sewage lines utilizing a swing valve for closing the inlet become inoperative at times due to the inlet becoming partially clogged with material in a manner to prevent closing of the swing valve. Under this condition back pressure in the outlet line opening to the chamber causes flow past the swing valve and into the drain and consequently into the building.

A feature of this invention is in the provision of a valve of peculiar form for closing the outlet to the chamber and a connection provided therefor which is provided with an inclined runway on which the valve rides. This inclined way through movement of the valve to desired position forces the face thereof into wedging engagement with the outlet and closes the chamber to back flow. This effectually closes the outlet line and permits opening of the chamber for repair of the device, or clearing of the device to permit normal operation of a swing valve under absence of back flow from the outlet.

A further feature of the invention is in providing a casing having an inlet adapted for connection with a drain and provided with a swing valve at a distance above the bottom of the chamber and positioned above the outlet giving opportunity for material of a character that might naturally prevent closing of the swing valve to pass to position below the said valve thus permits it to close.

These several objects and the various novel features of the invention are hereinafter more fully described and claimed, and the construction of a fitting involving my invention is shown in its preferred form in the accompanying drawings in which—

Fig. 1 is a vertical section of my improved sewage fitting.

Fig. 2 is a cross section thereof taken on line 2—2 of Fig. 1.

The device consists of a hollow casing 1 adapted to be set with its upper end practically level with the floor line indicated at 2 and has an inlet in the form of a ferrule 3 threaded at one end for assembly in the threaded aperture therefor in the casing and extending into the chamber a short distance as shown. This member 3 supports a swing valve 4 tending to close by gravity against the end of the inlet 3 which is preferably finished to provide a seat for the valve. The member 1 is provided with a cylindrical flange 5 to receive a tile drain 6 and a packing 7 is interposed between the tile and the flange 5. The end of the tile may seat against the bottom 8 of the recess formed about the threaded aperture for the ferrule 3 within the flange 5. The swing valve 4 is pivoted to a lug 9 on the ferrule 3 and the ferrule with the valve assembled thereon may be introduced into the interior of the casing through the upper end and threaded in place as shown. It will be noted that the inlet member 3 is positioned some little distance

above the bottom 10 of the casing 1. This casing, as before stated, extends to the floor line and is there provided with a removable cap 11 formed with an apertured portion 12 to receive the stem 13 of the valve 14. This portion 12 is provided with a threaded part 30 to receive the nut 15 and in which the stem fits. The nut is recessed to receive a ring 16 seated in a groove 17 on the valve stem. This permits rotation of the stem by the wheel 18 and prevents longitudinal movement of the stem through the nut but any arrangement of parts permitting such operation may be employed.

On opposite sides respectively the casing 1 is provided with ways 19 and 20 which extend practically vertically for the major portion of its length and, as is indicated at 21 in Fig. 1, is inclined toward the outlet conduit 22 which is threaded in the box 23 provided in the casing. The axis of the conduit 22 is materially below that of the ferrule 3 as shown. The valve is open on the inner side engaging the ways being U shaped in form in cross section as will be understood from Fig. 2, and tapering in form as will be understood from Fig. 1. The valve 14 at its upper end is provided with a boss 24 threaded to receive the threaded stem 13 whereby rotation of the hand wheel 18 causes the stem to revolve and to force the valve to the position shown in Fig. 1 or to raise it from the said position depending upon the direction of rotation of the hand wheel. It will be evident from the foregoing that by turnnig the wheel 18 in one direction will force the valve downwardly on the stem and, due to its riding on the inclined portion 21 of the ways, will wedge the same tightly in contact with the inner end of the outlet conduit 22 which extends into the chamber a slight distance as shown and finished to provide a seat for the valve. Preferably adjacent the boss 23 on the inner wall of the casing is provided a protruding portion or lug 25 adapted to cause the surface 26 of the valve to engage thereagainst when the valve is moved upwardly to open the conduit 22. This lug does not extend into the chamber to a distance quite equal to the extent to which the member 22 extends thereinto but practically to the same extent and the purpose of the lug is to guide the terminal point of the valve in such manner that in closing the valve from its open position the end thereof is held from striking the inwardly projecting end of the conduit 22 and thus insures the valve passing the end of the conduit to the position shown in Fig. 1.

The operation of the device will be readily understood from the foregoing—that is, the inlet member 3 being provided with the swing valve which tends normally by gravity to assume the closed position and being above the bottom of the chamber formed by the casing 1 and also above the axis of the outlet conduit 22, provision is made for any non-liquid material to drop from the inner end of the member 3 to below the swing valve 4 and thus readily pass through the normally open outlet. This arrangement alone largely eliminates a source of the trouble in devices of this character but in the event the swing valve is held open by material lying in the outlet end of the member 3 and the swing valve thus held from completely closing under pressure of the back flow, and back flow through the member 3 and drain conduit 6 connected therewith may be prevented by the closing of the valve 14. This valve is made in tapered form preferably of thin material as indicated in order that it may readily be forced through material that may lie in or at the mouth of the outlet conduit 22 and the inconvenience that would arise through back flow into the drain connection and thence into a building may positively be eliminated by the manually operable valve.

By arranging this device with a detachable cover at or slightly above the floor surface the said cover may be removed from the casing after the valve is closed by removing the hand wheel 18 and the retaining nut 15. This will permit access to the interior of the chamber for cleaning or repair even though there is a tendency to back flow in the outlet line, the chamber being held free from such flow or pressure by the closed valve 14. To permit a removal of the hand wheel 18, the end of the stem may be squared as indicated at 31 on which the handle fits and on which it may be retained in place by the removable nut indicated at 32. In this manner the cap can be removed while the valve member 14 is still in wedged position closing the outlet.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States is—

1. A fitting for sewage conduits comprising a casing, a hollow member extending into the casing at one side adapted for connection with a drain and providing an inlet to the casing, a swing valve on the said member within the casing adapted to normally close the said conduit by pressure within the casing, an outlet conduit extending into the said casing at a point below the inlet member, the said outlet conduit having a finished inner end, a valve member within the casing adapted to be moved to position over the said finished end of the outlet conduit or withdrawn therefrom, and an inclined way in the casing engaged by the valve in its movement to closed position providing a means for wedging the valve against the end of the outlet conduit.

2. A fitting for sewage conduits located below a floor or street surface comprising a chambered casing, the upper end of which extends to the said surface, a ferrule inserted in the casing with an aperture provided

therein at a distance from the bottom, a swing valve on the inner end of the ferrule, the opposite end of the ferrule being adapted for connection with a drainage conduit, the said casing having an aperture on the opposite side of the casing, an outlet conduit therein having a finishing inner end within the casing, a slide valve movable vertically in the casing, a stem therefor projecting through the said upper end, a hand wheel on the said upper end for operation thereof, the said valve having a flat side face to engage the end of the outlet conduit, the opposite side of the valve being formed at an angle thereto, an inclined way on each side of the casing on which the angular face of the valve rides, the said valve on being moved to closed position being wedged between the ways and the outlet end of the conduit, the arrangement being such that rotation of the hand wheel in one direction raises the valve from its seat and in the opposite direction forces it thereagainst.

3. A fitting for sewage conduits comprising a casing providing a hollow chamber, a sealable cover for the upper end thereof, said chamber having an opening on one side near the bottom for connection of an inlet conduit, a hollow tubular member mounted in the said opening and extending into the interior of the chamber, a swing valve on the inner end of the said member adapted to normally close the same by pressure within the chamber, said chamber further having an opening on the side opposite and below the first named opening, an outlet conduit connected with the last named opening and having an end portion extending into the said chamber, a valve member in the said chamber having a stem projecting through the said cover, means including a hand wheel on the extending end of the stem for moving the valve vertically, said chamber having vertical ways terminating in a portion adjacent the outlet inclined to the vertical on which the valve rides, said valve having portions for engaging the ways and an opposite portion seating against the inner end of the outlet conduit under pressure when the valve is moved to ride the inclined portion of the ways.

4. A fitting for sewage conduits comprising a casing providing a hollow chamber, a cover for sealing the upper end thereof, said chamber having an opening on one side for the connection of an inlet conduit and further having an opening on the opposite side and below the first named opening, an outlet conduit connected with the last named opening and having an end portion extending into the chamber, a vertically slidable valve member in the chamber, the chamber having vertical ways including a portion adjacent the outlet inclined to the vertical on which the valve rides, said valve having opposite and similarly inclined side portions for engaging the ways and a flat face portion for seating against the inner end of the outlet conduit under pressure when the inclined side portions of the valve are moved to ride the inclined portions of the ways whereby the valve is held against the inner end of the outlet conduit under pressure by the inclined ways and against back pressure in the outlet conduit.

In testimony whereof, I sign this specification.

EDWARD W. N. BOOSEY.