March 16, 1965 W. M. McKILLIP 3,173,442

PLUMBING CLEANOUT PLUG

Filed Nov. 2, 1959 3 Sheets-Sheet 1

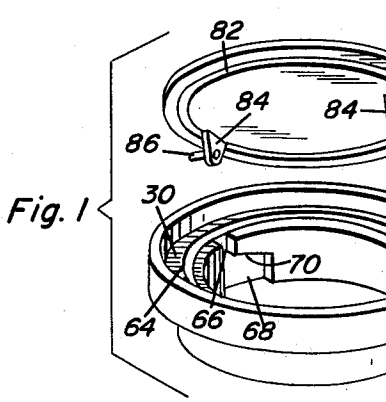


Fig. 1

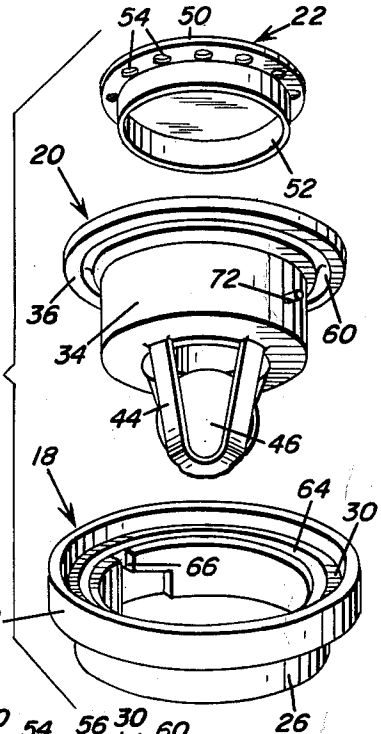
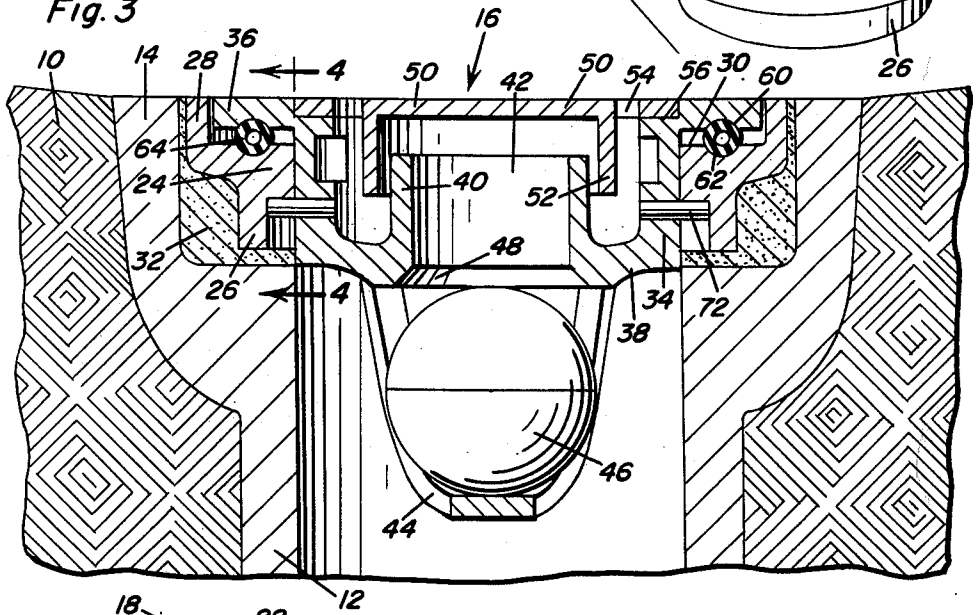


Fig. 2

Fig. 3



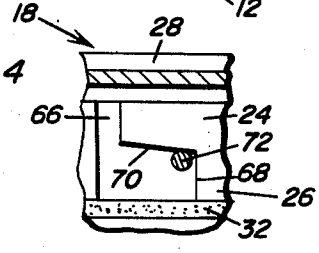


Fig. 4

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March 16, 1965 W. M. McKILLIP 3,173,442

PLUMBING CLEANOUT PLUG

Filed Nov. 2, 1959 3 Sheets-Sheet 2

Fig. 5

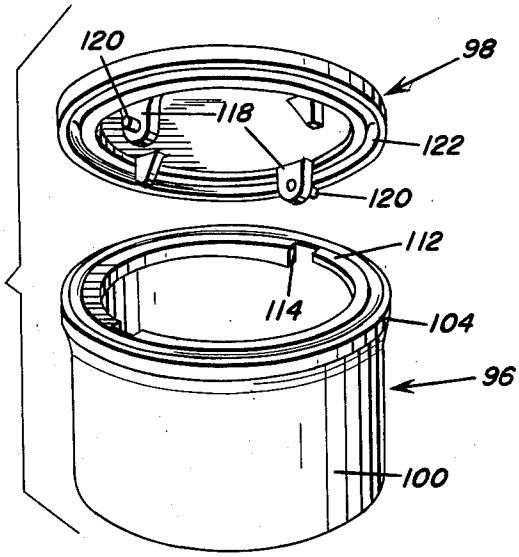


Fig. 6

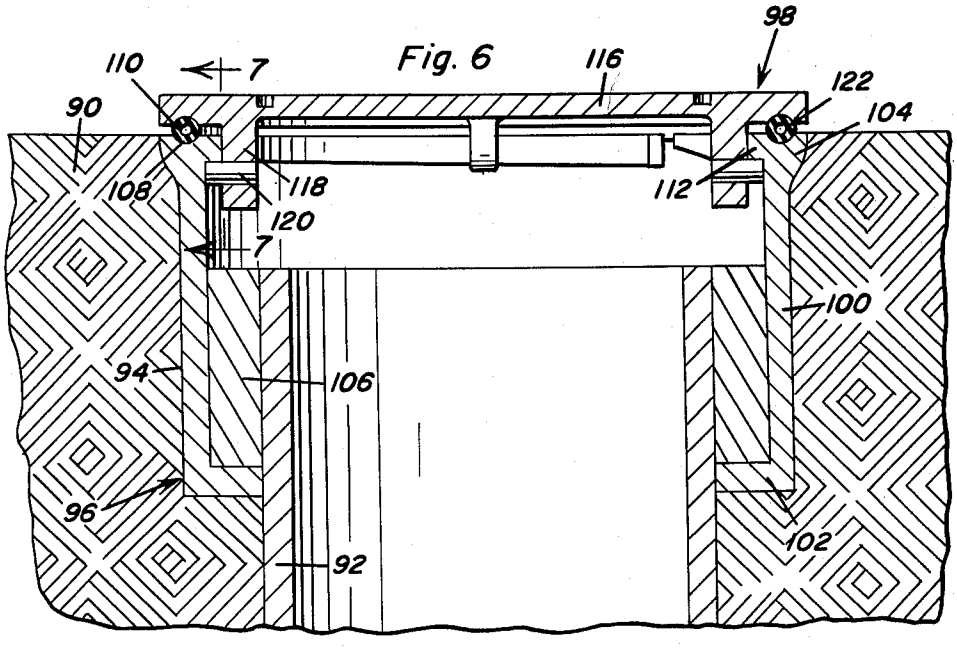
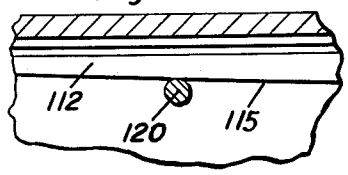


Fig. 7



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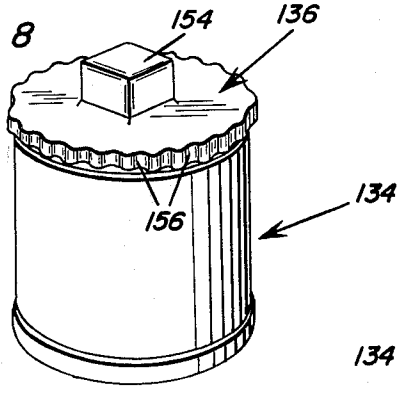
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March 16, 1965 W. M. McKILLIP 3,173,442

PLUMBING CLEANOUT PLUG

Filed Nov. 2, 1959 3 Sheets-Sheet 3

Fig. 8



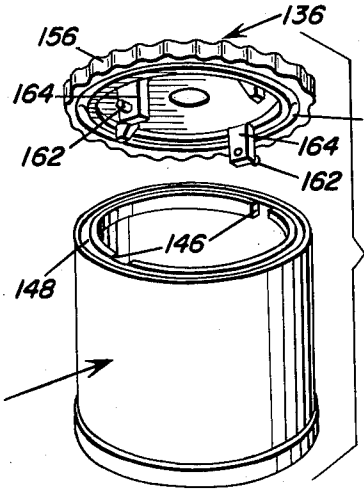
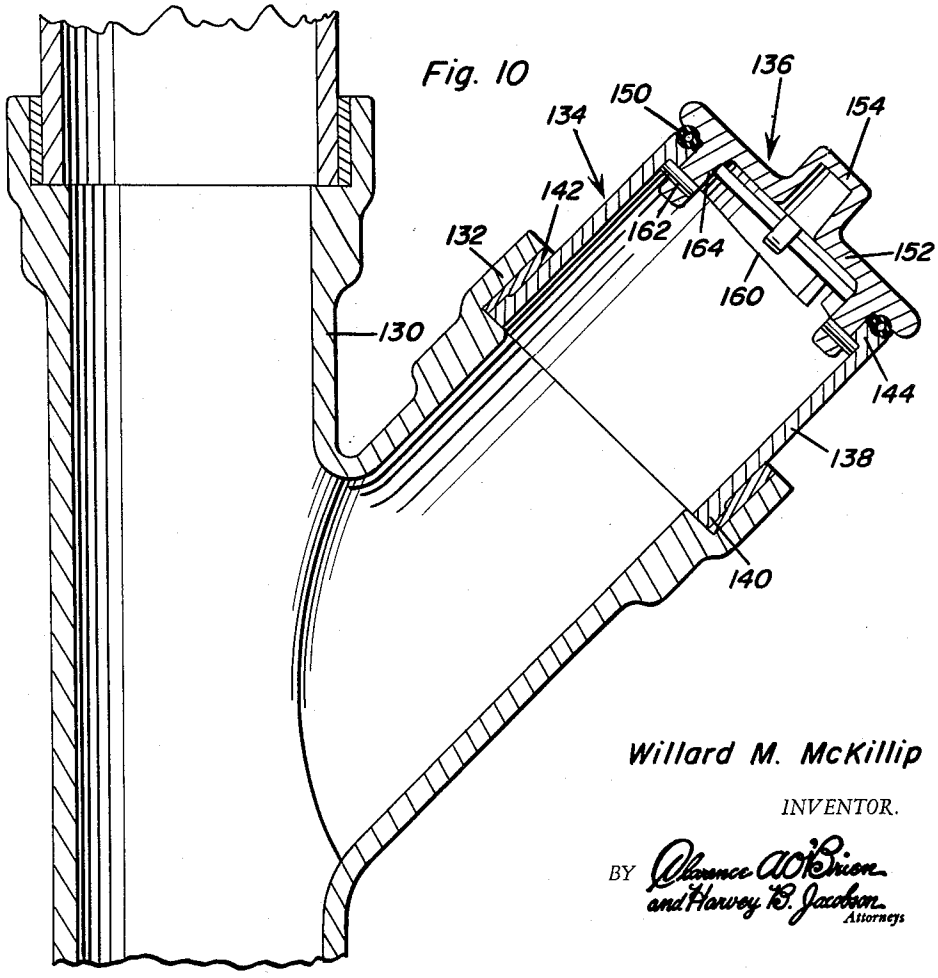


Fig. 9

Fig. 10



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1

3,173,442

PLUMBING CLEANOUT PLUG

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8 Claims. (Cl. 137—247.23)

This invention comprises a novel and useful plumbing cleanout plug and more particularly relates to a removable closure for use with soil pipes and similar purposes.

It is the primary object of this invention to provide an improved closure means for plumbing installations and arrangements which may be easily and readily applied thereto and which will effectively seal in a removable manner an opening into a pipe or other plumbing installation.

It is a further object of the invention to provide a cleanout, inspection or other closure for soil pipes and the like whereby there is attained an easily applied or removed closure for an opening and which closure will provide a gas-tight joint with its seat.

A further object of the invention is to provide a device in accordance with the preceding objects which will enable a back-water trap valve assembly to be securely but detachably mounted in a basement drain pipe or the like and will effectively prevent the escape of liquids or gases from the drain pipe to which it is connected.

Still another object of the invention is to provide a closure assembly especially adapted for use with cisterns, drain pipes, soil pipes or the like and which will provide a liquid and gas-tight seal therefor while effecting easy access to the interior of the casing.

A further object of the invention is to provide a closure assembly for coil pipes and the like which shall be specifically adapted for use as an inside leaded or an outside leaded bell construction for controlling access to drains, soil pipes and the like.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an exploded perspective view of an anchor collar and an interlocking closure therefor adapted to form a gas-tight closure for a conduit or tank to which it is connected;

FIGURE 2 is an exploded perspective view of a plumbing back-water trap showing the three components thereof in disassembled relation;

FIGURE 3 is a vertical sectional view of a plumbing back-water trap installation showing the three components of FIGURE 2 in the assembled relation of the installation;

FIGURE 4 is a detail view taken in vertical section substantially upon the plane indicated by the section line 4—4 of FIGURE 3 and showing in particular the locking means by which the back-water trap body is detachably secured in the anchor collar of the installation;

FIGURE 5 is an exploded perspective view showing in disassembled relation the two components of an inside leaded bell construction which may be utilized to control an opening in soil pipes or the like for cleanout of the same;

FIGURE 6 is a vertical sectional view of an inside leaded bell installation showing in their assembled relation the two components of FIGURE 5;

FIGURE 7 is a detail view taken in vertical section substantially upon the plane indicated by the section line 7—7 of FIGURE 6 and showing in particular the locking means by which the cover components of FIGURES 5 and 6 is detachably secured to the case or base component thereof;

2

FIGURE 8 is a perspective view showing in assembled relation the components of an outside leaded bell construction especially adapted for use as a closure for soil pipes and the like;

FIGURE 9 is an exploded perspective view of the outside leaded bell construction of FIGURE 8 but showing the casing and cover components in their disassembled relation; and

FIGURE 10 is a view in vertical section through a plumbing installation showing the outside leaded bell construction of FIGURES 8 and 9 with their casing and cover components in assembled relation with respect to each other and to the plumbing installation.

With continuing reference to the accompanying drawings, attention is directed first to the embodiments of FIGURES 2–4 wherein there is disclosed an application of the principles of this invention to a back-water trap installation. In these figures the numeral 10 designates a portion of a cellar floor or similar environment in which there is disclosed a drain or waste pipe 12 having the usual bell upper end 14 flush with the floor 10, in which drain pipe there is desired to be installed a back-water trap installation designated generally by the numeral 16 in order to prevent undesirable backflow of liquids or gases from the drain pipe 12 into the cellar or region above the floor 10, while permitting the draining of water or other liquids downwardly from the floor into the drain pipe 12.

The back-water trap assembly or installation 16 includes three components these comprising an anchor collar indicated generally by the numeral 18, a back-water trap body indicated generally at 20 and a closure designated by the numeral 22. The anchor collar 18 comprises an annular body or ring 24 having a diametrically reduced depending skirt portion 26 together with a diametrically enlarged upstanding cylindrical rim 28, these portions being connected by an annular horizontal surface or shoulder 30. The anchor collar 18 is adapted to be installed in the bell 14 of the soil pipe 12 and to be secured as by cement 32 or in any other desired and suitable manner. When so installed, it will be understood that the anchor collar is rigidly and fixedly secured in the bell 14, is flush with the top of the latter and with the cellar floor 10 and by virtue of its cement filling 32 is in a fluid-tight sealed engagement therewith.

The back-water trap 20 comprises a generally cylindrical hollow body 34 having an annular outwardly projecting flange 36 at its upper end, the body 34 being of a size to be slidably received within the body portion 24 of the anchor ring with the flange 36 in turn being received within the rim or upper wall 28 of the annular anchor collar for disposition above the horizontal annular surface or seat 30 as shown in FIGURE 3.

The cylindrical body 34 has a bottom wall 38 having thereon a centrally disposed upstanding sleeve 40 which defines a central passage 42 through the valve body. Depending beneath the bottom wall 38 and centrally located with respect to the passage 42 is a valve retaining cage 44 which supports and retains a ball check valve 46 beneath the bottom wall 38 for cooperation with the valve seat 48 formed in the bottom wall. The arrangement is such that when the valve body 46 is lowered by gravity to the bottom of the supporting cage 44 as shown in FIGURE 3, the valve seat will be uncovered and free passage through the sleeve 40 and the valve assembly into the drain pipe 12 will be permitted. However, when backflow of liquids and/or gases occur the valve 46 will be lifted against the seat 48 thereby establishing a fluid-tight seal therewith and preventing flow of liquids or gases up through the valve assembly.

The backwater trap closure 22 preferably comprises a

flat circular plate or disk 50 having a depending cylindrical skirt or sleeve 52. The disk is provided with a plurality of apertures 54 disposed in circumferentially spaced relation thereon and exteriorly of the skirt or sleeve 52 as shown in FIGURE 2.

From a study of FIGURE 3 it will be observed that the sleeve or skirt 52 extends into the hollow body 34 and has its lower end positioned below the top edge of the upstanding sleeve 40, while the disk 50 is snugly received in an annular recess 56 provided in the top surface of the cylindrical body 34. Thus, the apertures 54 establish continuous communication from the space above the installation into the hollow interior of the body 34 and through the annular passage between the sleeves 52 and 40 into the passage 42 and from thence through the valve seat 48 and valve cage 44 into the upper end of the drain pipe or soil pipe 12.

In order to effect a fluid tight seal between the back-water trap assembly 20 and the anchor collar 18 there are provided complementary circumferential grooves as at 60 and 62 in the undersurface of the flange 36 and in the horizontal shoulder or surface 30 for the reception of an annular O-ring or sealing ring 64 preferably of neoprene or other suitable material, this ring being preferably in the form of a tube as shown in FIGURE 3 to contribute to its resiliency of action.

An interlocking means is provided by which the back-water trap assembly 20 may be detachably securely fastened into the anchor collar 18. For this purpose, the inside wall of the anchor collar is provided with a plurality of vertically extending recesses or slots 66 which open upon the horizontal shoulder or surface 30 and which at their lower portions are circumferentially enlarged as at 68, and which have inclined top surfaces as at 70.

Corresponding to each of the slots 66 is a locking pin 72 carried by and projecting radially from the cylindrical body 34, which pins are adapted to be passed downwardly into the slots 66, and then by rotation of the body will be caused to engage the inclined shoulder 70 as the pins move from the slot 66 to the position shown in FIGURE 4. As the pins 72 move circumferentially along the inclined surfaces 70, they cause the body 34 to move downwardly towards the anchor collar 18 and thus serve to compress the O-ring 64 to thereby effectively establish a fluid-tight seal as previously mentioned.

It will thus be apparent as so far described that there has been provided a back-water trap assembly which when installed as shown in FIGURE 3 will be very efficient in permitting the drainage of water from a cellar floor or other area into a drain pipe 12, but will effectively prevent any return flow of liquid or liquid accompanied by gases into the cellar.

In some instances, it may be desired to use the installation of the anchor collar 18 in a drain pipe, cellar floor or to control the opening into some other space by a closure but without employing a non-return valve assembly. For this purpose the arrangement shown in FIGURE 1 may be employed it being understood that the anchor collar 18 is of the same construction described in connection with FIGURE 3. However, with the anchor collar 18 of FIGURE 1 secured in place in the same manner as the collar 18 of FIGURE 3, there is provided a removable closure 80 in the form of a disk which is adapted to be received within the rim 28 of the collar and which in turn is provided with a circumferential groove 82 for receiving therein the previously mentioned O-ring or sealing means 64 which is seated in the groove in the annular surface 30 of the anchor collar 18. In order to interlockingly engage the cover 80 with the anchor collar 18, the cover is provided with a plurality of depending lugs 84 thereon, each of which carries a laterally projecting locking pin 86. As will be understood, there is provided one such lug and locking pin for each of the interlocking slots 66 of the anchor collar 18.

Thus, the arrangement of FIGURE 1 provides a convenient means whereby the back-water trap assembly of FIGURE 3 may be removed and the opening in the drain pipe closed by the closure 80; or whereby a convenient readily removable closure may be provided for waste pipes, soil pipes or other similar arrangements.

Attention is next directed to the embodiment of the invention illustrated in FIGURES 5–7. In these figures is disclosed an inside leaded bell construction adapted for use with drain pipes or soil pipes to provide a cleanout or inspection opening for obtaining access thereto. In FIGURE 6 the numeral 90 designates a body into which extends one end of a drain pipe or soil pipe 92 for which it is desired to provide a cleanout plug or inspection plug controlling the open end of the same. As shown in FIGURE 6, there is provided a cylindrical recess 94 in the material 90 into which the upper end of the pipe 92 extends. The bell construction of this embodiment comprises a lower or base component indicated generally by the numeral 96 together with a closure component indicated at 98. The base component consists of a cylindrical casing 100 of greater diameter than the pipe 92 with which it is to be associated, and which has an annular inturned flange 102 at its lower end which snugly embraces and receives an upper portion of the pipe 92. At its upper end, the casing is diametrically enlarged as at 104 and is flush with the surface of the material 90 so that the casing 100 is embedded in the chamber 94. A fluid tight joint is provided between the exterior surface of the pipe 92 and the casing 100 by means of the usual filling or packing 106 of lead or other suitable material inserted and forced into position for this purpose in the usual manner.

The top surface of the casing 100 is a flat annular surface which is provided with a circumferentially extending groove 108 in which is received a neoprene O-ring or sealing ring 110 of the same construction as the previously mentioned ring 64. The upper edge of the casing 100 is also provided with an annular inturned flange as at 112 and this flange is provided with one or more locking slots 114 which extend vertically therethrough as shown in FIGURE 5. The inside or lower edge of the flange 112 as shown best in FIGURE 7 has an inclined or camming surface 115 which extends circumferentially of the flange.

The closure 98 comprises a flat disk or plate 116 for its top surface portion and has a plurality of depending lugs 118 projecting therebeneath, each lug in turn carrying outwardly projecting locking pins 120 which may be passed downwardly through the slots 114 as previously mentioned and upon rotation of the cover the pins will pass under the camming surface 115 as shown in FIGURE 7 and thus draw the closure member downwardly to tight engagement with the casing 100. For this purpose, there is provided a circumferential groove or channel 122 on the underside of the cover which cooperates with and is complementary to the channel 108 for receiving the gasket 110 therebetween in tightly sealed engagement.

From the foregoing it is believed that the operation of this embodiment of the invention will be readily understood and it will be seen that there is provided a secure interlocking but readily detachable engagement between a closure member and an inside leaded bell for a cleanout assembly for pipes and the like.

FIGURES 8–10 disclose still another manner in which the principles of this invention may be employed to effect a releasable, fluid-tight closure adapted for use with an access opening, cleanout or inspection opening for drain pipes and the like. In this arrangement there is shown a plumbing installation in which an outside leaded bell closure assembly is installed. Thus, the numeral 130 designates a portion of a pipe having a bell outlet portion

132 in which is desired to install a cleanout and inspection assembly. As illustrated, the assembly provided for this purpose is installed within the bell 132 and consists of two components, these being a casing component 134 and a detachable closure component 136. The casing component comprises a cylindrical casing 138 having an annular enlargement or rib 140 at its lower end which is received within the bell 132 and is retained therein as by leading or other packing means 142 in a conventional manner. At its upper end the casing has an inturned annular flange 144 having a flat annular top surface in which is provided a locking slot or slots 146. Also provided in the top surface of the flange 144 is the annular groove 148 in which is received the neoprene locking ring 150 which preferably is of the construction described in connection with the preceding embodiments.

The closure member 136 consists of a flat disk or plate 152 provided at its intermediate portion with a raised boss 154 which is non-circular and provides a means for applying a wrench or the like to the closure for removing the same or for applying the same to the casing 138. To facilitate rotating of the closure, the rim of the same may be roughened or notched as at 156 to afford a good gripping engagement of the closure. The underside of the plate 152 is likewise provided with an annular circumferentially extending groove 158 which is complementary to the groove 148 for receiving the O-ring therebetween.

When the cylindrical closure casing 138 is installed in a floor, the flat closure member similar to member 116 of FIGURE 6 will be used. Such closure member will be provided with blind bores for engagement by suitable wrenches for applying or removing the same.

The underside of the flange 144 is preferably likewise provided with an inclined camming surface as at 160, see FIGURE 10, with which the locking pins 162 carried by depending lugs 164 of the closure are adapted to cooperate.

The operation of this form of the invention is identical to that previously described.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A back trap construction for drain pipes and the like of the type having a diametrically enlarged end portion with a diametrically enlarged chamber therein, said construction comprising an anchor collar with all portions thereof being disposed entirely within said chamber, means securing said collar in said chamber in fluid tight engagement with said enlarged end portion, said collar including a cylindrical lower rim, a diametrically enlarged cylindrical upper rim and an annular laterally thickened portion connecting said rims, an annular recessed upwardly disposed seating surface in said annular portion disposed in said upper rim, a back flow preventing valve assembly detachably mounted in said collar, said valve assembly comprising a hollow body provided with rigidly connected cylindrical inner and outer sleeves rigidly joined and closed at their lower ends by an annular web and each extending into said collar, an annular mounting flange on said outer sleeve seated on said seating surface, a valve seat on the lower end of said inner sleeve, a valve cooperating with said valve seat, said valve and valve seat being disposed

below said collar, locking means on the inner and lower portion of said lower rim and on the outer surface of said outer sleeve for releasably securing said valve assembly to said collar.

2. The combination of claim 1 wherein said securing means sealingly engages the entire exterior side and bottim surfaces of said collar and is disposed between and spaces the side and bottom surfaces of said collar from the adjacent surfaces of said chamber.

3. The combination of claim 1 including a recess in the top surface of said body, a closure removably seated in said recess and having a top surface flush with those of said body and collar, said closure having a depending skirt loosely embracing said inner sleeve.

4. The combination of claim 1 wherein the lower surface of said annular flange and said horizontal surface of said collar have complementary circumferential grooves, a compressible neoprene sealing ring seated in said grooves and retained under compression by said locking means.

5. The combination of claim 1 wherein said locking means comprises vertically extending slots in said lower rim having circumferentially extending cam surfaces projecting laterally therefrom, said outer sleeve having laterally projecting locking elements receivable in said slots.

6. The combination of claim 1 wherein said closure has a depending skirt embracing said inner sleeve in spaced relation thereto, said closure having drain apertures therethrough communicating with the interior of said valve body between said sleeves.

7. The combination of claim 6 wherein said annular web and the walls of said sleeves are imperforate defining a collection chamber therebetween, the upper end of said inner sleeve terminating below the upper end of said outer sleeve, said skirt having its lower edge disposed in said collection chamber below said upper end of said inner sleeve.

8. The combination of claim 7 wherein the lower surface of said annular flange and said horizontal surface of said collar have complementary circumferential grooves, a compressible neoprene sealing ring seated in said grooves and retained under compression by said locking means.

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