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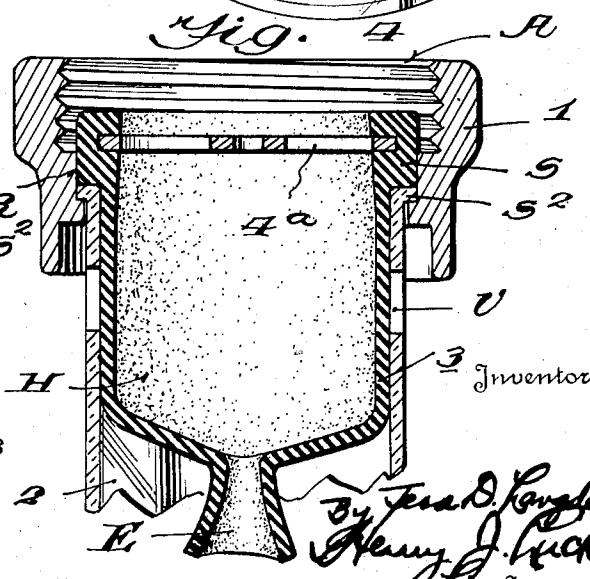
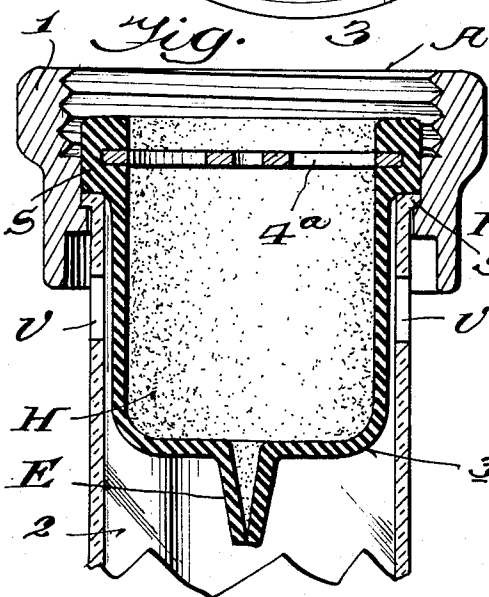
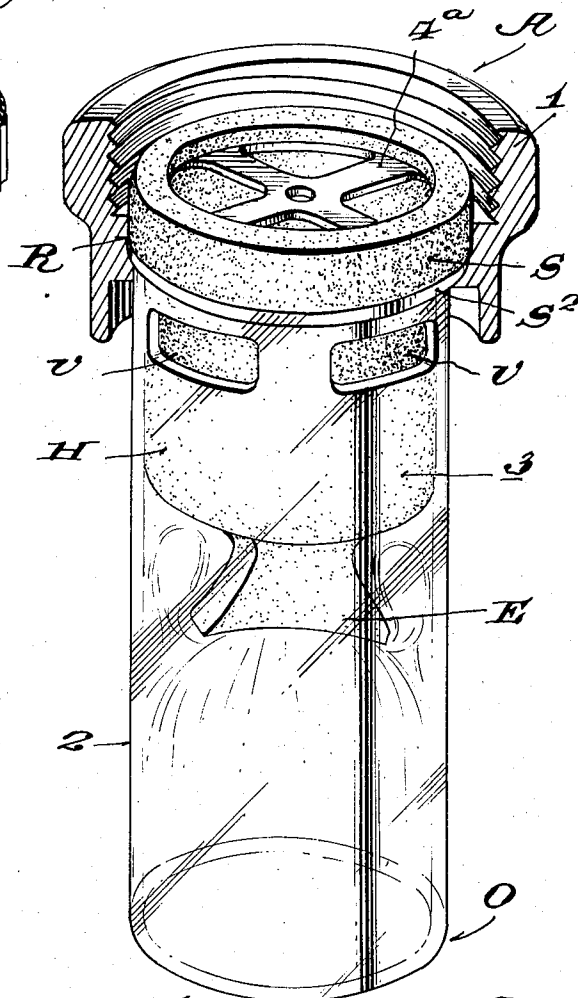
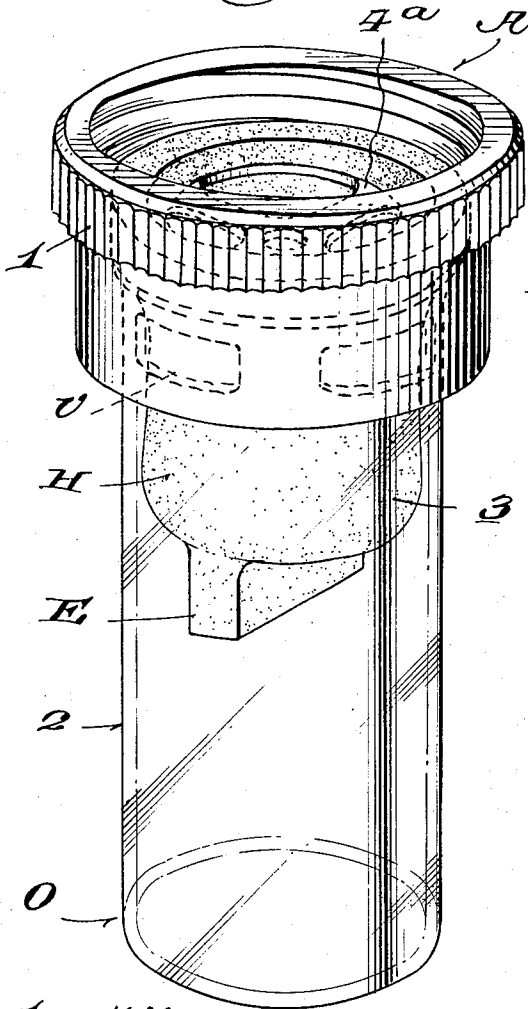
2,371,449

VALVE

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Fig. 1

Fig. 2



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2,371,449

VALVE

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4 Claims. (Cl. 137-69)

The invention relates to valves having a casing having openings vented to atmosphere for attachment to valves cross connected to a sewer system and has for its primary purpose protection of a fluid supply line against pollution by backflow from any possible source of contamination due to subatmospheric pressure induced in such cross connected fluid supply system.

A further purpose is to render the device proof against tampering or removal of vital parts with the object in view of rendering all parts visible at a glance at all times, by providing means to make such tampering a visible factor.

A still further object is to render the device as nearly foolproof as possible: First, by such construction as to eliminate possible distortion by use of undue wrench power; second, the design of the device is such that the operation of the device as to make obvious the fact that a wrench is not needed to make fluid tight connections with the supply line.

Other and further objects and purposes will appear as the specification proceeds.

The accompanying drawing illustrates a preferred form of reduction to practice which it is definitely understood is for the purpose of illustration only, and the invention is not confined to the specific form shown, being limited only by the scope of the appended claims.

In the drawing:

Figure 1 is an elevational view of a preferred form of the invention; in phantom showing the transparent casing with a slit rubber sleeve valve at rest in normal position.

Figure 2 is an elevational view of Figure 1, as viewed at an angle to that of Figure 1, with coupling portion partly cut away in section, and indicating liquid passing through the device.

Figure 3 is a central vertical sectional view of Figure 1.

Figure 4 is a central vertical sectional view of Figure 2.

Like characters designate like parts in the respective figures of the drawing. The reduction to practice illustrated by Figures 1 through 4 shows a casing made of glasslike transparent material such as transparent plastics suitable to the purpose, polystyrene, cellulose acetate, vinylidene chloride, Lucite, etc., for example, which are of a nature to absorb a minimum of moisture and afford maximum strength. The coupling means or the internally threaded nut 1 forms an intake aperture A, while the extended tube 2 provided with vents V forms the wall of the casing

depending from nut 1 and terminating in an outlet O.

A shouldered sleeve valve 3 made preferably of resilient or elastic material capable of being deformed and returning to normal shape after being deformed, is provided with the shoulder S forming a rim projecting radially outward of the upper end of a hollow sleeve portion H of valve 3 supported by a shoulder S projecting radially inward of the wall of the nut 1 and just below the threads. A smooth narrow centralizing ring formed by the inner wall of nut 1 surrounds the outer periphery of the shoulder S of valve 3.

The illustrated preferred embodiment has a flanged rigid spider 4a inserted into the upper end of valve 3, and forms a barred member across the upper end of the valve 3. The flange of spider 4a acts as a friction washer and when installed a rubber or fiber sealing washer (not shown) is used above the spider 4a to make a tight coupling joint with the fluid supply line (not shown) and prevent leakage of fluid.

The illustrated preferred embodiment has the valve 3 with the peripheral edge of spider 4a disposed in a recess formed by a groove running around the inner circumference of the shoulder S. The material of the valve 3 forms a combined resilient friction and sealing washer having sufficient thickness to allow spreading to easily seal the coupling against leakage when applied hand tight to the threaded outlet of a supply valve; the use of a wrench being unnecessary because the soft shoulder S is forced radially outward across the top of ring 4a toward the internal thread of nut 1. The shoulder S is of ample thickness to allow for an amount of turning pressure sufficient to distort or even wreck the attaching means without detrimental effect on the operation of the device, due to the inherent elasticity of the valve 3; fluid pressure passing through the casing will cause the valve 3 to conform to any change in the shape of nut 1 or tube 2.

It will be noted that the nut 1 has no facets to invite the use of a wrench.

The operation of the invention and effect of the transparent casing are as follows:

When the operating parts of the device are in normal position of rest as illustrated in Figure 1, the hollow sleeve portion H clears the wall of the casing 2 to permit the ingress of air therearound to prevent backflow of fluid. At such times as a subatmospheric condition may exist when pressure fluid is flowing through intake A and when the extended lips E are held apart to form an opening not beyond the capacity of vents V to al-

low atmospheric pressure to obviate backflow when any abnormal condition exists such as a foreign body lodged between the extended lips E or a distortion of the material occurs which would render the device ineffective as a backflow preventing device.

If the wall surrounding the hollow sleeve portion were in normal position clearing the wall as in Figure 1, and a foreign body large enough to close the vents V were lodged between the extended lips E, the lower circumference of the sleeve 3 would be distended to impinge the casing wall 2, therefore the air vents V would be effectually closed at a point below the vents V, and the extended lips E open whereby the device could be rendered ineffective as a backflow preventer. This condition would not be indicated unless the casing is transparent. It will be seen that a transparent casing will expose to view at all times the operating part or check valve formed by sleeve 3. If the extended lips appear as in Figure 2 and the hollow portion H clears the casing wall 2 and vents V as indicated in Figure 1, it is obvious that the backflow preventer cannot function normally and proper attention can be immediately given to remedy the difficulty.

Furthermore, any abnormal condition will be apparent at all times.

It will be observed that if the hollow portion H bulges into the vents V shown in Figure 2, and a restricted amount of fluid or none at all, due to artificial stoppage in the member 3, is passing through the device, the location and the cause of such stoppage are immediately observable through the transparent casing, thus obviating the necessity of disassembling the device in order to locate and determine the cause of existing dangerous conditions, which might not be known without the transparent casing.

It has been proved by thousands of installation of various makes of backflow preventers that not only the abnormally induced hazardous conditions may often prevail but that the air vents are often soldered up by repair men to stop leakage; also in many instances the waterway of the check valve has been deliberately wedged open, to thereby close the air vents to prevent leakage, thus rendering the backflow preventer inoperative. This is particularly true where rigid check valves are used. It is therefore apparent that a very certain way to obviate tampering is by the use of transparent material for the casing as all conditions can be observed and cured, as afforded by the present invention.

It is therefore further apparent that the safety factor of a health protecting device of the present nature is greatly enhanced with the definite new result achieved, of producing a self-indicating and policing device for the more adequate protection of public health.

The combination is new, and while the features and parts of the invention may be separately old, the combination and novelty of the present invention is such as to accomplish the purpose of more adequate mechanical policing and unquestioned novelty of structure, combining in a new way both mechanical and physical qualities to obtain in a new way the exact results and benefits shown.

Having described my invention and that which is new and novel and the results therefrom, I claim:

1. A check valve device comprising hollow means of pressure-distortable material and other hollow means including a tubular member

having vents opening to one condition of pressure, the hollow means further comprising coupling means connectably associated at one of its end openings with said tubular member to form jointing faces and at its opposite end opening exposed to another condition of pressure; and a check valve disposed between said coupling means and the vented portion of said tubular member, said check valve including a shoulder of resilient material arranged to be disposed in pressure engagement with the jointing faces of said tubular member and of said coupling means, said check valve further including a hollow body portion associated with the vents of said tubular member, whereby under said one condition of pressure said hollow body portion effects closure of the vents of said tubular member and under said another condition of pressure the vents of said tubular element communicate with the interior of said tubular member.

2. A check valve device comprising hollow means of pressure-distortable material, said hollow means including a tubular member having vents opening to one condition of pressure, said hollow means further comprising coupling means connectably associated at one of its end openings with said tubular member to form jointing faces and at its opposite end opening exposed to another condition of pressure; a check valve disposed between said coupling means and the vented portion of said tubular member, said check valve including a shoulder of resilient material arranged to be disposed in pressure engagement with the jointing faces of said tubular member and of said coupling means, said check valve further including a hollow body portion associated with the vents of said tubular member, whereby under said one condition of pressure said hollow body portion effects closure of the vents of said tubular member and under said another condition of pressure the vents of said tubular element communicate with the interior of said tubular member; and means of rigid material affording passage of fluid flow therethrough engaging said shoulder of resilient material for maintaining said shoulder in pressure engagement with said jointing faces.

3. A check valve device comprising hollow means of pressure-distortable material, said hollow means including a substantially transparent tubular member having vents subject when open to one condition of pressure, said hollow means further comprising coupling means connectably associated at one of its end openings with said tubular member to form jointing faces and at its opposite end opening subject to another condition of pressure; a check valve disposed between said coupling means and the vented portion of said tubular member, said check valve including a recessed shoulder arranged to be disposed in pressure engagement with the jointing faces of said tubular member and of said coupling means, said check valve further including a hollow body portion associated with the vents of said tubular member, whereby under said one condition of pressure said hollow body portion effects closure of the vents of said tubular member and under said another condition of pressure the vents of said tubular element communicate with the interior of said tubular member, and a spider having its rim disposed within the recess of said shoulder of said check valve.

4. A check valve device comprising hollow means of pressure-distortable material, said hollow means including a substantially transparent

tubular member having vents opening to one condition of pressure, said hollow means further comprising coupling means connectably associated at one of its end openings with said tubular member to form jointing faces and at its opposite end opening exposed to another condition of pressure; a check valve disposed between said coupling means and the vented portion of said tubular member, said check valve including a shoulder of resilient material arranged to be disposed in pressure engagement with the jointing faces of said tubular member and of said coupling means, said check valve further includ-

5 ing a hollow body portion associated with the vents of said tubular member, whereby under said one condition of pressure said hollow body portion effects closure of the vents of said tubular member and under said another condition of pressure the vents of said tubular element communicate with the interior of said tubular member; and means of rigid material affording passage of fluid flow therethrough engaging said 10 shoulder of resilient material for maintaining pressure upon said shoulder in pressure engagement with said jointing faces.

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