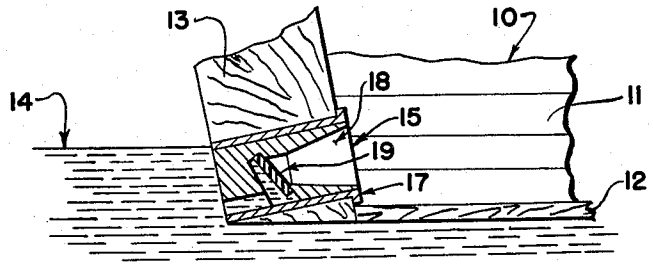
Nov. 8, 1960 R. K. YOUTIE 2,959,144

AUTOMATIC BAILER

Filed Dec. 13, 1957

FIG. 1



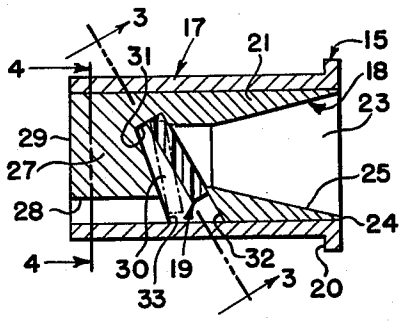


FIG. 2

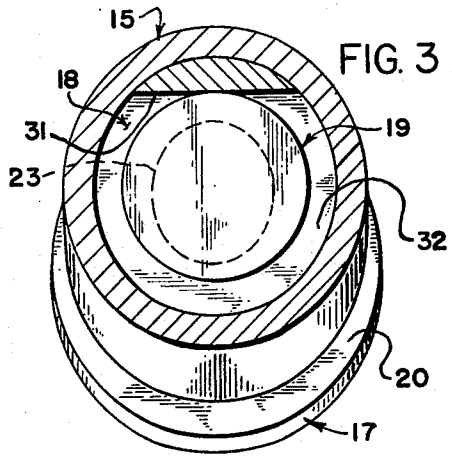


FIG. 3

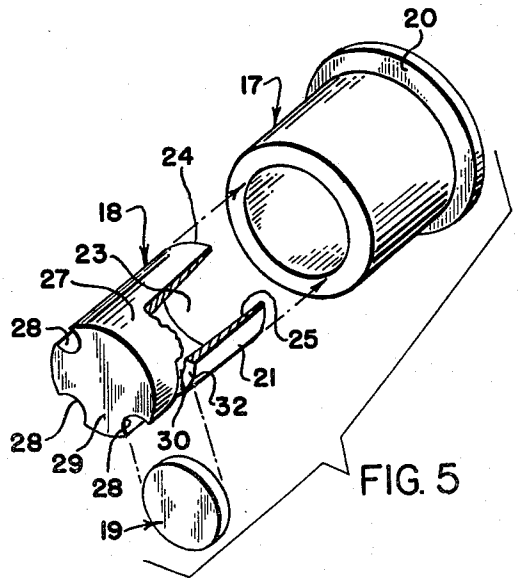


FIG. 5

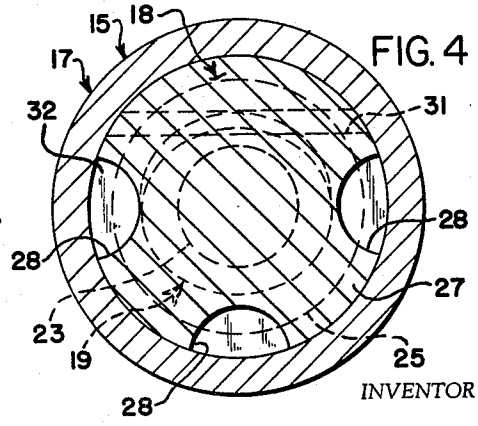


FIG. 4

INVENTOR

Robert K. Youtie

United States Patent Office 2,959,144 Patented Nov. 8, 1960

2,959,144

AUTOMATIC BAILER

Robert K. Youtie, Haddonfield, N.J.
(3201 PSFS Bldg., 12 S. 12th St., Philadelphia 7, Pa.)

Filed Dec. 13, 1957, Ser. No. 702,670

4 Claims. (Cl. 114—185)

This invention relates generally to one-way fluid passage means, and is particularly concerned with such means as are adapted to automatically pass fluid only in one direction and under certain conditions.

While the present invention has been primarily developed and employed for use as a bilge water outlet through the hull of a boat, and will be illustrated and described hereinafter with particular reference thereto, it is appreciated that the device is capable of many varied applications, all of which are intended to be comprehended herein.

It is therefore one object of the present invention to provide an automatically operable closure for an automatic bailer adapted to extend through the side or transom of a boat hull.

It is a further object of the present invention to provide a one-way fluid valve which overcomes the above-mentioned difficulties, and is adapted for use on the outlet of a bilge pump at a relatively low location to minimize the necessary pumping capacity.

It is still another object of the present invention to provide a one-way valve of the type described which is extremely simple in construction and operation, durable and trouble free in use, relatively inexpensive to manufacture, and which can be quickly and easily installed without the exercise of greater than average skill or care.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

Figure 1 is a longitudinal sectional elevational view showing a fluid-outlet device constructed in accordance with the present invention, and illustrating the device as installed in the hull of a boat;

Figure 2 is a longitudinal sectional view similar to Figure 1, somewhat enlarged, the device being illustrated in closed condition in solid lines, and in open condition in phantom;

Figure 3 is an enlarged, transverse sectional view taken substantially along the line 3—3 of Figure 2;

Figure 4 is an enlarged transverse sectional view taken substantially along the line 4—4 of Figure 2; and

Figure 5 is an exploded, perspective view showing the elements of the device of Figure 2, partly broken away for clarity of understanding.

Referring now more particularly to the drawings, and specifically to Figure 1 thereof, a boat hull is generally designated **10**, and includes a side wall **11**, bottom wall **12**, and transom or rear wall **13**. An outlet device of the present invention is generally designated **15**, and illustrated as installed in the transom **13**. Exteriorly of the hull **10** is illustrated the water **14**; and, the outlet device

or valve **15** may be installed below the water surface, or waterline of the boat, as shown.

The outlet device or valve **15** may be formed of three parts, as illustrated, or designed otherwise, if desired. The three parts are best seen in Figure 5 as including an open-ended tubular housing or sheath **17**, an insert **18** adapted to be received in the housing, and a valve member or closure **19** adapted to be received in the insert. The tube or sheath **17** may be of generally cylindrical configuration, and may be provided on its inner end with an outstanding, peripheral flange **20**.

The insert **18** has a generally cylindrical external configuration and is of a size for snug reception longitudinally within the housing **17**. Of course, if the sheath **17** is of other than cylindrical configuration, the insert **18** may be configured for snug conforming engagement in the sheath. The insert **18** includes an inner portion **21** which defines a constriction or port element in the sheath **17**. That is, the port element or constriction **21**, formed of the inner part of insert **18**, is of externally cylindrical configuration for snug engagement in the housing **17**, and is provided with an opening, bore, or passageway **23** extending longitudinally inward from the inner end **24** of the insert **18** and terminating medially thereof. Further, the bore **23** may have its inner-end portion, that is the portion **25** adjacent to the inside of the hull **10**, of a flaring or increasing dimension toward the inner end **24** of the insert.

The outer-end portion **27** of the insert **18** defines a retainer for the valve closure **19**, as will appear more fully hereinafter, and is also of generally cylindrical external configuration, but provided with one or more openings **28** about the periphery of the part, which openings extend longitudinally inward from the insert outer end **29** and define external, longitudinal grooves in the retainer part **27**.

Intermediate the ends of the insert **18**, and substantially sub-dividing the insert into its constriction or port element **21** and retainer **27**, is a transverse kerf or slot **30**. More specifically the kerf or slot **30** extends transversely inward from the underside of insert **18** at an oblique angle with respect to the insert axis, opening laterally outward through the insert, and terminating in an end wall **31**. It will be observed that the opening or slot **30** is inclined rearward or outward, that is it extends upward and rearward or outward, so as to define a rearwardly or outwardly inclined, preferably flat face **32** on the outer side of the port element or constriction **21**. Stated otherwise, the outer side or face **32** of the port element or constriction **21** faces outward and downward, so as to face at least partially downward, and intersects at its uppermost region with the top or end wall **31** of the opening **30**. The face **32** is preferably flat for conforming engagement with the closure or valve element **19**, as will appear presently. The upper or end wall **31** of the opening **30** preferably inclines forwardly or inwardly to its intersection with the face **32**. The wall or surface **33**, which defines the inner end or face of the retainer **27**, also preferably inclines rearward or outward, intersecting at its upper end with the end surface **31**, and may be parallel or at an angle with respect to the face **32**. Obviously, the port element or constriction **21** is thus spaced from the retainer **27** by the slot or opening **30**; and, the port element and retainer are spaced from each other a distance greater than the thickness of the closure element **19**, as will appear presently.

It will now be understood that the interior passageway or port **23** of the constriction or port element **21** opens through the inclined face **32** to the opening or open space **30**, which in turn communicates through the retainer openings or grooves **28** to open through the outer-end surface **29**. Thus, with the insert **18** snugly received

in the housing 17, there is fluid communication afforded through the housing. In the assembled condition with the insert 18 received in the housing 17, as best seen in Figure 2, the valve member or closure 19 is loosely disposed in the space or opening 30. The closure 19 is illustrated as being a generally flat disc, which is preferred, but its configuration may be varied without departing from the spirit and scope of the present invention. The closure 19 is advantageously fabricated of a buoyant material adapted to float in water, and also preferably of material having a slight flexibility or resilient yieldability. For this purpose, polyethylene plastic has been found satisfactory. In Figure 2 it will be observed that the closure 19 is of a thickness less than the width of the slot or opening 30, as defined between the faces 32 and 33, and from Figures 3 and 4 that the closure disc 19 is of a diameter smaller than the depth or height of the slot 30. Thus, the closure member 19 is loosely received in the opening 30 and freely movable therein between a position in facing engagement with the surface 32, the solid-line position of Figure 2, and a position out of facing engagement with or away from said face. Further, in Figure 3 it may be observed that the closure member 19 is of a size and shape such as to completely close the passageway 23 when in facing engagement with the face 32, and also of a size and shape such as to leave open the retainer openings 28 when the closure is moved outward against the retainer. Thus, the closure 19 is configured so as to close the port element or constriction 21 to the movement of fluid inward therethrough when the closure element engages with the outer side or face 32 of the constriction, and also is configured so as not to close the retainer openings 28 when the closure is moved against the retainer out of its closing relation with respect to the constriction.

In practice, the outlet device 15 may be installed in the transom 13, or may also be installed in the bottom wall 12 or side walls 11, if desired. However, for use as an automatic bailer, transom installation is preferred, while use as a bilge-pump outlet may dictate otherwise. In the installation of Figure 1, the water 14 exteriorly of the hull 10 flows into the outlet device 15 through the retainer openings 28 and into the opening 30. This floats the buoyant valve element 19 to its highest possible position in the opening 30, in which position the valve element is in sealing engagement with the port-element face 32. Thus, the port element 21 is automatically sealed or closed by the tendency of water to pass inward through the outlet device. However, upon forward movement of the hull 10, a suction would be produced rearward of the outlet device to move the closure 19 to its dot-and-dash-outline position of Figure 2, and if water is contained in the hull it will then pass outward through the port passageway 23, opening 30, and retainer openings 28, to effect automatic draining or bailing.

Although the device, as described hereinbefore, has been found entirely satisfactory in preventing the entry of water into the hull, even during long periods of nonuse of the boat, it may be desirable under certain circumstances to provide a manually insertable and removable plug in or cap on the outlet device, to positively seal the latter when the boat is not in use.

From the foregoing, it is seen that the present invention provides a one-way valve or fluid outlet for boats which fully accomplishes its intended objects, and is well adapted to meet practical conditions of manufacture, installation, maintenance, and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A one-way valve comprising an open-ended housing, a constriction in said housing, an open retainer in said housing on one side of and spaced from said constriction, said constriction having its side adjacent to said retainer facing obliquely downward, and a generally flat closure element loosely interposed between said constriction and retainer and freely movable between positions in engagement with said constriction and retainer, respectively, said closure element being configured to close said constriction when engaging the latter and not to close the said retainer when in engagement therewith.

2. A one-way valve according to claim 1, said closure element being buoyant to float upward into closing engagement with the adjacent constriction side.

3. A one-way valve for the hull of a boat, said valve comprising an open-ended tubular housing having inner and outer ends and adapted for insertion into a boat hull with its inner and outer ends opening respectively toward the inner and outer sides of said hull, an open constriction in said housing having inner and outer sides respectively adjacent to the inner and outer ends of said housing and having its outer side facing only partially downward, a buoyant generally flat closure loosely received in said housing adjacent to the outer side of said constriction and floatable in said housing into closing engagement with the outer side of said constriction, and an open retainer fixed in said housing outward of said closure and spaced from said constriction sufficiently to permit said closure movement away from said constriction to open the latter while retaining said closure in position to float into said closing engagement.

4. A one-way valve comprising a port element having a through opening terminating at opposite sides of said port element, said port element being adapted for installation with one side facing obliquely downward, a permanently open retainer mounted in facing spaced relation with respect to said one side of said port element, a generally flat closure element loosely interposed between said port element and retainer and freely movable between a closed condition bearing against said port element and an open condition spaced from said port element, said closure element being buoyant to float upward into closed condition against said one side of said port element, and a generally downwardly facing abutment wall located between said retainer and said one side of said port element above said opening, said abutment wall being engageable with said closure element to properly position the latter in its closed condition.

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