Nov. 27, 1962 R. E. KAROLY 3,065,725

AUTOMATIC BOAT BAILER

Filed Nov. 28, 1960

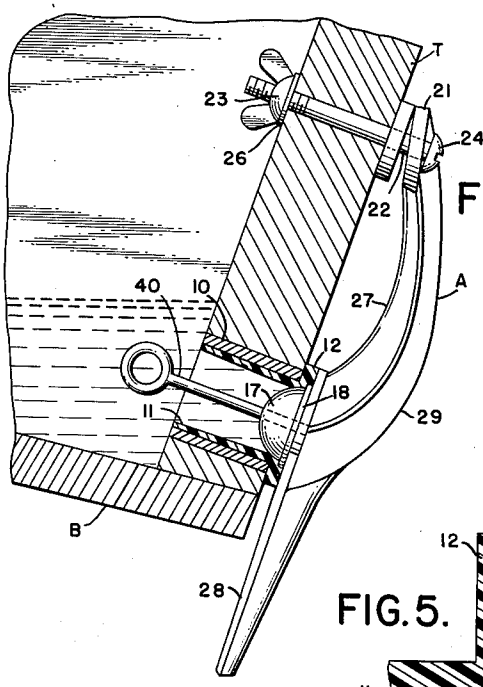


FIG. 1.

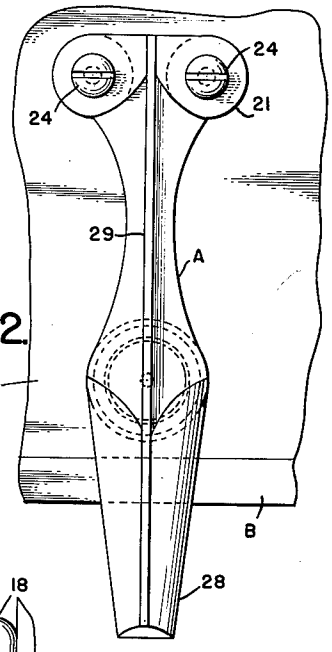


FIG. 2.

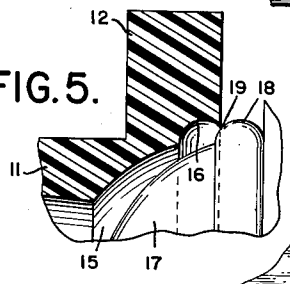


FIG. 5.

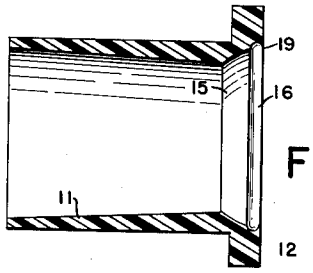


FIG. 3.

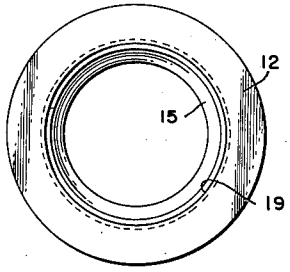


FIG. 4.

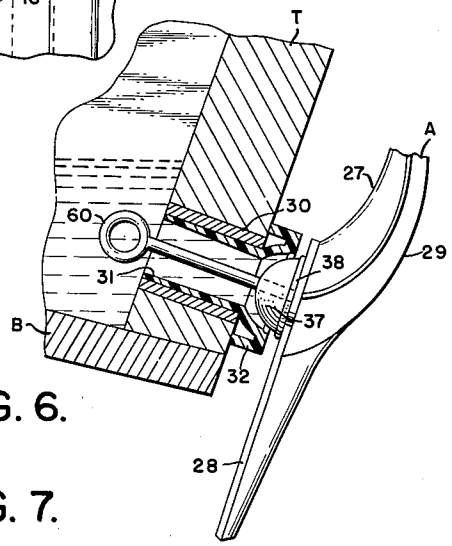
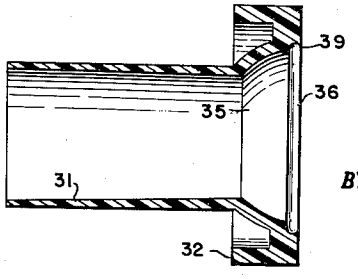


FIG. 6.

FIG. 7.



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AUTOMATIC BOAT BAILER

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This invention pertains to an automatic bailer for small power-driven boats. More particularly it is concerned with certain features of improvement by which (*a*) the bailer may be readily attached in operative position upon the boat, (*b*) a valve is provided to automatically control operation of the bailer, (*c*) the valve may be manipulated to a snap-locked position wherein it tends to remain closed to safeguard the boat during periods of non-operation, (*d*) the valve is spring pressed to a second closed position from which it may normally be displaced to an open position only when the boat has attained a predetermined speed of movement through the water, (*e*) adjustments may readily be made to require the speed of boat movement to be slower or faster, as desired, for producing an automatic displacement of the valve to open position, and (*f*) all these ends, and others hereinafter to be pointed out, may be accomplished with a construction having a minimum number of part all of which may be sturdy, fully accessible, and non-corrosive in the presence of water.

These and other objects of my invention may be realized from an embodiment thereof in the preferred form which is illustrated in the accompanying drawing in the manner following:

FIGURE 1 is a fragmentary view in section, centrally and longitudinally of a boat bottom adjacent its transom at the stern, showing in side elevation my improved automatic boat bailer as it appears when installed operatively and in snap-locked closed position relative to a scupper that is commonly provided through the transom adjacent the boat bottom; FIG. 2 is a rear elevation of the bailer when installed upon a boat transom; FIG. 3 is a longitudinal section through a scupper-fitting sleeve having at one end a head which is formed with a valve seat facing rearwardly adjacent the outer side of the transom; FIG. 4 is a view in elevation looking toward the head end of the sleeve; FIG. 5 is an enlarged fragmentary detail in section, taken longitudinally of the sleeve, showing the contour of the seat and that of the cooperating valve member, the latter being displaced from a snap-locked sealing position in resilient engagement with the sleeve head; FIG. 6 which is a view similar to FIG. 1, shows a smaller diameter sleeve having a head of sufficient diameter to accommodate a seat of the same size as the larger sleeve of FIG. 3, the valve being illustrated as removed from its seat to an open position; and FIG. 7 is an enlarged longitudinal section through the sleeve and head of FIG. 6.

Referring to FIGS. 1 and 2, the after end portion of the bottom B of a conventional power-driven boat is illustrated, as is also at its stern a transom T that is joined thereto to rise therefrom. When in motion, the bow end of the boat tends to rise so that any water accumulated within the boat will flow to the stern where it attains a maximum depth. A scupper hole wherein is fixedly secured a bushing **10** of bronze or the like is commonly provided through the transom just above the boat bottom, its location being usually just below the water line when the boat is at rest. At such times a plug or stopper (not shown), fitted to the scupper inner end, provides a closure therefor. Upon a boat having such a bushed scupper opening, but with the plug or stopper first removed therefrom, the automatic bailer now to be described may be readily installed.

A resilient sleeve **11** of rubber, plastic or the like (see

FIG. 3) is driven into the bushing **10** from its outer end to remain fixedly in place therein. The walls of the sleeve may taper to an increased thickness toward its outer end where it is provided with a flange head **12** defining interiorly thereof a duplex seat having a diameter slightly greater than the inside diameter of the sleeve. The contours of these seats (see FIG. 5) are such as to provide an inner concave portion **15** of relatively long radius and an outer concave portion **16** of relatively short radius, both conforming in size and contour to that of a movable duplex valve member having a ball portion **17** extending inwardly and axially from a larger diameter circular base portion **18** formed with a convex peripheral contour. When the valve member is fully advanced into the duplex seat, its ball portion **17** occupies the circular chamber of concave contour defined by the inner seat portion **15**, its base portion **18** being then disposed within the outer seat portion **16**. A lip **19** at the after end of the outer concave portion **16** stands at the entrance to the valve seat. It extends radially inwardly to slightly reduce the diameter of the opening into the seat. The ball portion **17** of the duplex valve member is of sufficiently small diameter to pass freely through this opening when moved axially in either direction, but not so its circular base portion **18** whose diameter exceeds slightly that of the entrance opening defined by the lip **19**. Movement of the valve member completely into seating position to effectively close the scupper opening requires, therefore, application of an axial force sufficient to compress or deform the resilient lip **19** to the point that the circular base portion **18** of the valve member may pass thereby and into the outer concave seat portion **16** provided for its reception. In this position the valve member remains securely locked in place from which it may be displaced only by application of a counter force sufficient to overcome the yielding resistance of the lip **19** at the entrance into the duplex seat.

The duplex valve member just described may conveniently be formed as part of an integral with a vertically disposed arm A which is mounted upon the after face of the transom T (see FIGS. 1 and 2). As shown, the upper end of this arm is provided with a cross head **21** through which are formed two holes, one toward each end thereof. Through each such hole is inserted a bolt **22** whose shank is extended through a registering hole bored through the transom T to receive on its threaded inner end portion a wing nut **23** or the like. At its opposite end each bolt is formed with a head **24** adapted to engage the outer face of the cross head **21**. A spacer ring **25** of desired thickness is placed on each bolt between the outer face of the transome and the cross head of the arm, and upon each bolt may also be placed a washer **26** at the base of its nut **23** to receive and distribute the thrust force thereof, when tightened upon its bolt. Both the ring and washer are desirably produced from bronze or other material which is non-corrosive when wet.

The arm A just described need be but a few inches in length, probably less than half a foot. Preferably it is bowed rearwardly at **27**, starting at its cross head and continuing downwardly for something more than half its length where the forwardly facing duplex valve member is carried and axially positioned at a point oppositely of the sleeve **11** so as to cooperate with the duplex valve seat at its outer end. Below this point the arm is extended to provide, in effect, a blade **28** of limited area having its working face disposed crosswise of the longitudinal center of the boat at a point below its bottom B. The arm A which is resilient so as to flex endwise may be stiffened, if needed, by a reinforcing longitudinal rib **29** extending outwardly from its after face.

An arm, when installed according to the description

given, should be subject to a constant force tending to press its free end portion forwardly, thereby to move the duplex valve member carried thereby axially toward its seat. The two bolts 22 which pass through the cross head near its top may be adjusted properly to maintain the valve member against the sleeve head with a desired pressure. In effect, the arm is a resilient lever having its fulcrum point along the top edge of its cross head, the power forec being applied by the two bolts to press the weight, i.e. the valve member, in the free end portion of the lever against the valve seat with a pressure that is adjustable.

Retractive flexing movement of the arm lower end portion will take place in response to a predetermined counter force. Such a force is exerted against the blade 28, produced by pressure of the water through which the boat is driven when a minimum speed of forward motion has been attained. To hold the arm A yieldingly in a forward position where the duplex valve member remains engaged with the seat therefor, I utilize a constantly acting spring force which may be inherent in the arm itself when produced from a material appropriate for this purpose. Nylon, which is non-corrosive in the presence of water, is suggested as eminently suitable. When constructed with the valve member as an integral part thereof, the number of parts is held to a minimum so is advantageous from this standpoint alone.

The sleeve 11 (FIG. 3) is formed with an outside diameter of proper size for a fixed mounting within the bushing 10 whose size is standard in many boats. Since there may be cases where the bushing 30 (FIG. 6) is slightly smaller, a correspondingly smaller sleeve 31 should be provided therefor. To meet this situation without any change in the resilient arm A and valve member carried thereby, is a simple and inexpensive matter. But any such smaller sleeve should be provided with a flanged head 32 that is relatively larger, both longitudinally and diametrically, in order to accommodate therein the duplex valve seat for the standard size resilient arm and valve member carried thereby. Even so, the position of the seat is slightly further astern, necessitating a corresponding rearward repositioning of the fulcrum point of the resilient arm A to assure accurate seating of its valve member within the seat therefor. This may be accomplished by the simple expedient of substituting for the spacer rings 25 a pair of slightly thicker rings (not shown) which act to shift the fulcrum point the requisite distance rearwardly. A sleeve construction having interiorly of its head 32 a duplex seat exactly the same in size and contour as that of FIGS. 3 and 5 is illustrated in FIGS. 6 and 7, and parts thereof and of the cooperating valve member, which correspond to those already described in connecting with the remaining figures, are marked with like reference numerals plus 20.

As already noted, the valve member is adapted to be snap-locked in the seating position of FIG. 1. To advance it to this position, a manual force, supplementary to the spring force applied through the arm A, may at times be required. To facilitate application of such a manual force, an operating handle is provided, and this may take the simple form of an eye bolt 40 (or 60 in FIG. 6) whose threaded end portion is anchored in the ball 17 (or 37, as the case may be), axially thereof. The eye end of this bolt will then be projected past the inner end of the sleeve 11 (or 31) to lie within the boat so as to be convenient for manipulation whenever the duplex valve member is to be snap-locked into sealing position or be displaced therefrom by an opposite movement. In normal use of the boat, in the interest of safety, the snap-locked position should be maintained whenever the boat is tied up at its mooring.

There is also a second sealing position of the duplex valve member where it is yieldingly maintained solely in response to the spring force exerted by the resilient arm A. This position may be reached either by application

of a manual force or by water pressure upon the blade 28 in response to forward movement of the boat. In this second position the circular base portion 18 of the valve member, while displaced rearwardly and outwardly of the outer seat portion 16 provided therefor, remains pressure-engaged with the lip 19 against its outer face (see FIG. 5). During periods while the boat is away from its mooring, the duplex valve member may be left in this spring-pressed position where it tends to remain until retracted in response to water pressure upon the blade 28 consequent upon the boat being driven forwardly at or past the minimum speed requisite for this purpose. In this third position (see FIG. 6) where the valve is opened, water within the boat is free to drain out therefrom through the scupper so long as the minimum boat speed for this purpose is maintained.

In both its first and second positions the valve member closes the scupper opening due to biasing of the pivoted arm A, but in only the first position is the valve member held snap-locked in place. The enlarged base 18 in coaction with the resilient lip 19 provides, in effect, a detent which holds the valve member releasably in the first position, and in so doing supplements the biasing force exerted thereon through the pivoted arm. In response to a sufficient counterforce, however, as when forward motion of the boat produces a water pressure against the blade 28, the valve member is caused to overcome the holding force of the detent, thereupon shifting rearwardly through the second to the third position where continuing water pressure upon the blade acts to hold the scupper open for escape of bilge water therethrough.

I claim:

1. An automatic bailer for a power-driven boat having a stern transom through which is a scupper opening adjacent the boat bottom, comprising a valve seat at the after end of the scupper opening having at the seat entrance an inwardly extending resilient lip defining an opening of reduced size, a coacting valve-closing member having at its widest point a diameter slightly exceeding that of the opening at the entrance to the seat whereby application of an axially directed force to the valve member is required in an amount sufficient to deflect the lip to enlarge the seat opening for movement of the valve member on to or off its seat, an arm carried on the transom providing a mounting for the valve member and spring-biased to advance the valve member axially toward its seat but with a force only sufficient to advance the valve member to a position of rest against the circular lip at the seat opening, and submerged blade means in connection with the arm, responsive to water resistance when the boat is in forward motion, and operable when the valve member is in closed position upon its seat to counteract the arm biasing force sufficiently to retract the valve member away from its seat for movement outwardly beyond the lip opening thereby to restore communication through the scupper opening.

2. An automatic bailer for a power-driven boat having a stern transom through which is a scupper opening adjacent the boat bottom, comprising a valve seat through which is a scupper opening having at the seat entrance a resilient lip provided with inner and outer faces defining an opening slightly less in size than that of the seat, a coacting valve-closing member having at its widest point a base whose diameter exceeds that of the opening at the entrance to the seat thereby requiring deflection of the resilient lip for axial movement of the valve member to and off the seat therefor, the valve member, when engaged with its seat, being held thereon by the lip, and a transom-mounted support whereon the valve member is carried having means normally biasing the valve member toward successive closing positions in one of which its base is engaged with the inner face of the lip and in the other of which its base is rested against the outer face of the lip for free rearward movement away therefrom in re-

sponse to a counterforce overbalancing that of the biasing means.

3. An automatic bailer for a power driven boat having a scupper opening adjacent its bottom, comprising a duplex two-position valve seat at the after end of the scupper opening, a valve-closing member movable axially toward and from the seat for closing engagement with either portion thereof or disengagement therefrom, tension means urging the valve-closing member toward the duplex seat, and coacting means on the valve member and seat providing a detent which serves to bias axial movements of the valve member at one point.

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