

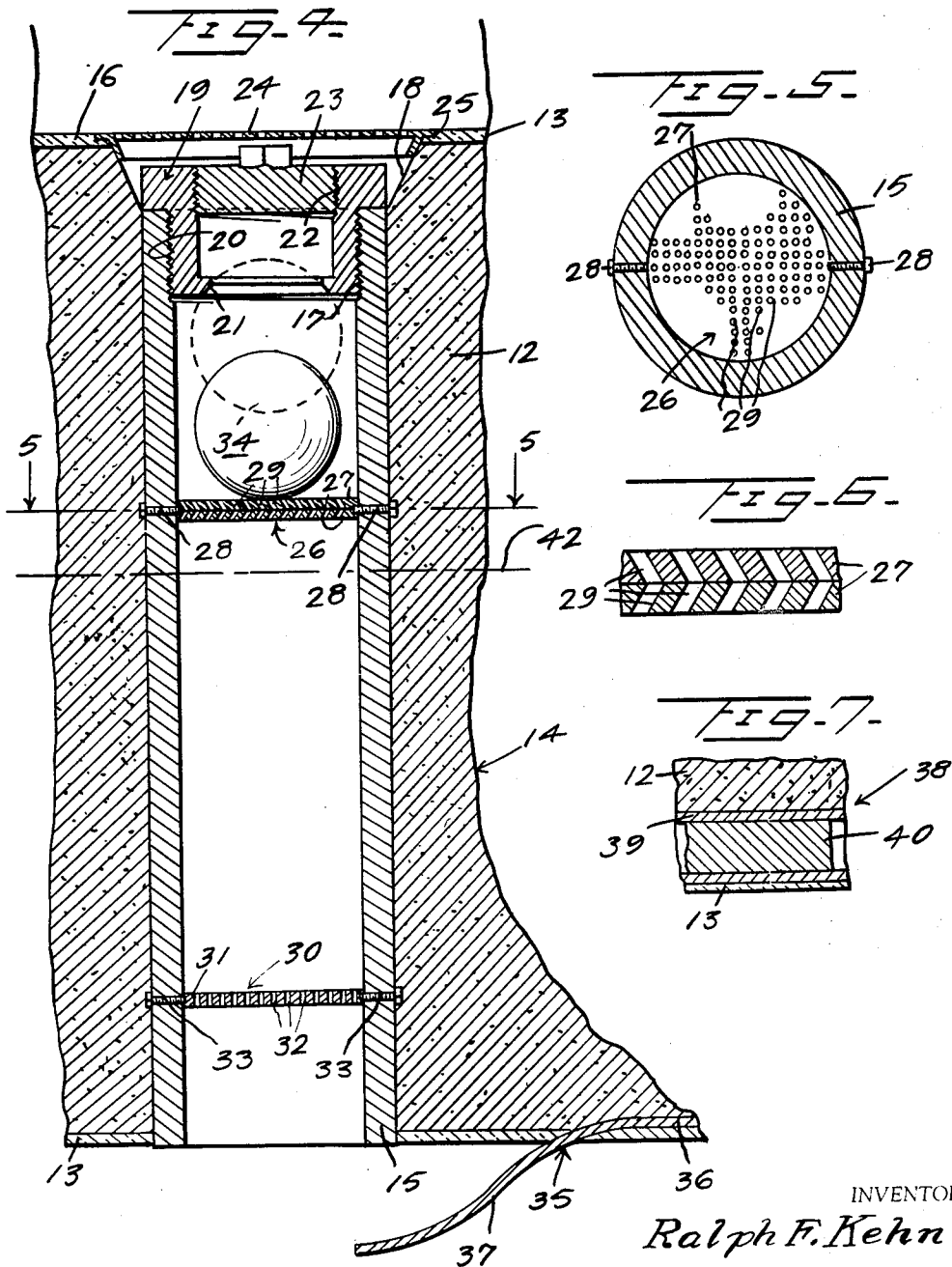
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R. F. KEHN
SELF-BAILING BOAT

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2 Sheets-Sheet 2



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SELF-BAILING BOAT

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2 Claims. (Cl. 114—185)

This invention relates to a novel construction of boat formed of a lightweight material and having a bottom of substantial thickness so that the inside deck level of the hull is above the waterline of the boat, when normally loaded, to permit water to drain by gravity from within the boat through drain ports formed in the hull bottom.

More particularly, it is an object of the present invention to provide a boat of the aforescribed character wherein the drain port is equipped with valve means to prevent water entering the boat through the drain port.

A further object of the invention is to provide a boat construction whereby water is drained therefrom while the boat is not in motion and wherein additional siphoning means is provided for effecting a more rapid removal of water from the interior of the boat while the boat is under way.

Still a further object of the invention is to provide a boat construction having a weighted keel disposed sufficiently below the level of the hull bottom to adequately stabilize the boat.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a fragmentary longitudinal sectional view of a boat, constructed in accordance with the invention, taken substantially along a plane as indicated by the line 1—1 of Figure 2;

Figure 2 is an enlarged fragmentary cross sectional view of the boat, taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a fragmentary bottom plan view of a portion of the boat;

Figure 4 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 4—4 of Figure 2;

Figure 5 is a horizontal sectional view taken substantially along a plane as indicated by the line 5—5 of Figure 4;

Figure 6 is an enlarged vertical sectional view of a portion of the structure as illustrated in Figures 4 and 5, and

Figure 7 is an enlarged fragmentary vertical sectional view, taken substantially along a plane as indicated by the line 7—7 of Figure 2.

Referring more specifically to the drawings, the numeral 10 designates generally the hull of a boat 11, constructed in accordance with the invention. The hull 10 is formed primarily of balsa wood, cork, Styrofoam, Foamglas, or other similar lightweight material, designated generally 12, having a low specific gravity. The hull material 12 is covered both internally and externally thereof with coatings of Fiberglas 13 of sufficient thickness to adequately reinforce and strengthen the hull 10. The exterior Fiberglas coating 13 is preferably made thicker than the interior coating 13 to protect the hull material 12 against damage due to the boat striking embedded or floating objects or due to grounding.

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As clearly illustrated in Figures 1 and 2, the bottom 14 of the hull 10 is substantially thicker than the remainder of the hull, this additional thickness being provided by the material 12 of low specific gravity. In the boat 11 as illustrated, two transversely spaced corresponding drain tubes 15 are embedded in and extend substantially through the hull bottom 14, and are preferably disposed adjacent the stern of the boat 11, at approximately the lowest normal level of the inside deck or bilge line 16 of the boat. However, as the description proceeds, it will be apparent that the boat could be equipped with only a single drain tube 15 or three or more such drain tubes, depending upon the size of the boat.

Referring to Figure 4, the lower end of each drain tube 15 is preferably disposed substantially flush with the outer coating or skin 13 of the hull bottom and opens downwardly therefrom. The upper end of each tube 15 is internally threaded, as seen at 17, and terminates somewhat below the deck 16 and opens into a cavity 18 in the upper side of the hull bottom. A valve seat member 19, in the form of a hollow plug, is threadedly secured to the upper end of the tube 15 by engagement of a threaded portion 20 thereof with the threaded portion 17. The hollow plug or valve seat member 19 has an annular downwardly flared valve seat 21 at its lower end and the open upper end of the hollow interior or bore thereof is internally threaded, as seen at 22, to receive a plug 23 which may be utilized to seal the tube 15 and render it inoperative. A perforated deck plate 24 covers the open top of the hull recess 18 with the periphery thereof seating in an annular recess 25 in the interior deck coating 13. As previously stated, the plug 23 will normally be removed and is applied only in the event that it is desired to allow water to accumulate within the boat 11.

The tube 15 is provided with a baffle unit 26 comprising two discs 27 of a diameter to fit snugly within the bore of the tube 15 and which are secured immovably therein and in abutting relation to one another by setscrews 28 which are threaded radially through the wall of the tube 15 and against the discs 17. As seen in Figure 6, said discs 27 are provided with a plurality of bores 29 which extend therethrough at an incline. The discs 27 are positioned so that the inner ends of the bores 29 are disposed in registration. Thus, the registering bores 29 of the two discs 27 form an angle with one another to restrict the flow of liquid through the baffle 26.

A sea strainer 30 is mounted in the tube 15 below the baffle 26 and comprises a disc 31 which is perforated as seen at 32. The disc 31 fits relatively snug in the bore of the tube 15 and is secured immovably therein by setscrews 33 which are threaded radially through the wall of said tube and which about the periphery of said disc 31. The strainer 30 is located adjacent the open lower end of the tube 15 and the baffle 26 is disposed above said strainer 30 and beneath and spaced from the valve seat member 19.

A ball valve 34, comprising a hollow sphere, preferably a ping-pong ball, is loosely confined between the valve seat 21 and the baffle 26, as seen in Figure 4.

A deflector blade 35 has a forward end 36 anchored in the lower part of the hull bottom 14. Said blade 35 has an intermediate and rear portion 37 extending downwardly and rearwardly from the underside of the hull bottom 14 and terminating beneath the forward portion of the tube 15, as seen in Figure 4. The deflector blade 35 is of a width at least equal to the diameter of the tube 15, as seen in Figures 2 and 3.

It will be understood that each tube 15 includes all of the parts previously described and as illustrated in Figure 4. The hull bottom 14 is provided with a centrally

disposed depending keel 38 which extends from end-to-end thereof and to the bottom edge of which is secured a tube 39 which forms a part of the keel 38 and which is enclosed by the outer skin or coating 13 of the keel. The tube 39 is preferably formed of copper and is filled with lead, as seen at 40 in Figures 2 and 7, for weighting the hull 10 and to stabilize the boat 11.

If preferred, and as illustrated in Figure 1, the transom 41 may constitute a solid wood panel of ordinary thickness so that an outboard motor can be readily mounted thereon in a conventional manner.

With the plugs 23 removed, the self-bailing units 15 are capable of functioning for draining any water from within the boat 11. The normal waterline of the boat 11, as indicated by the broken line 42 in Figures 1, 2 and 4, is substantially below the level of the inside deck or bilge level 16 and slightly below the level of the baffle 26. Said waterline 42 constitutes the normal waterline of the boat when supporting a normal load. Consequently, the valves 34 of the two tubes 15 will normally be in open positions beneath and spaced from the valve seats 21 and supported by the baffles 26. Any water within the boat will flow by gravity through the deck plates 24 and into the tubes 15 to thus maintain the interior of the boat dry.

If the boat is forcibly submerged it will rise even while carrying a load due to the buoyancy of the hull 10, and the water within the boat will escape through the tubes 15 until all of the water has been drained from the boat in this manner. During this operation, as the boat rises from a submerged position, the buoyancy of the hull will only be required to support the weight of that part of the water which is disposed above the level of the water surrounding the boat, after the deck level of the boat is above the surface of the water. It will thus be seen that the boat 11 is capable of draining any water in the boat and while the boat is not under way or in motion.

The deflector blades 35 are provided to produce a siphoning action in the tubes 15 to effect a more rapid removal of the water from the interior of the boat while it is under way and in the event that the boat ships a considerable amount of water, as while cruising in heavy seas. The valves 34 and valve seat members 19 may be omitted and are provided only to prevent water from passing upwardly through the tubes 15 into the interior of the boat 11, where the boat is cruising in heavy seas and is pitching excessively. The sea strainers 30 prevent debris from passing upwardly into the tubes 15 and the baffles 26 restrict an upward surging of water into the upper parts of the tubes 15, as where the boat is pitching in heavy seas, and to enable the valves 34 to close and preventing the water from passing upwardly through the valve seat members 19.

The keel 38 effectively protects the deflector blades 35 from damage due to grounding or resulting from the boat striking submerged objects. In addition, the weight of the keel 38 and the weight 40 in the bottom thereof will effectively function to stabilize the boat 11 and to prevent excessive rolling thereof.

Various modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claims,

I claim as my invention:

1. A self-bailing boat comprising a hull formed primarily of a lightweight material having a low specific gravity and including a bottom of substantial thickness whereby the normal waterline of the boat, when loaded, is below the level of the bilge line of the boat, at least one conduit extending through the hull bottom through which water from the interior of the boat is adapted to drain, a valve seat mounted in the upper end of said conduit, a buoyant valve contained in said conduit beneath the valve seat and movable into engagement with the valve seat for closing the conduit to prevent water passing upwardly through the conduit into the boat, a baffle member mounted in a part of said conduit and disposed beneath and spaced from the valve seat, said baffle member having a plurality of small bores extending therethrough and constituting the only means for the passage of water between the parts of the conduit disposed above and below the baffle member for preventing a surging of water through said conduit, said baffle member being disposed beneath the buoyant valve for normally supporting said valve in an open position out of engagement with the valve seat, and each of said bores of the baffle member having end portions angularly disposed relative to one another.

2. A self-bailing boat comprising a hull formed primarily of a lightweight material having a low specific gravity and including a bottom of substantial thickness whereby the normal waterline of the boat, when loaded, is below the level of the bilge line of the boat, at least one conduit extending through the hull bottom through which water from the interior of the boat is adapted to drain, a valve seat mounted in the upper end of said conduit, a buoyant valve contained in said conduit beneath the valve seat and movable into engagement with the valve seat for closing the conduit to prevent water passing upwardly through the conduit into the boat, a baffle member mounted in a part of said conduit and disposed beneath and spaced from the valve seat, said baffle member having a plurality of small bores extending therethrough and constituting the only means for the passage of water between the parts of the conduit disposed above and below the baffle member for preventing a surging of water through said conduit, said baffle member being disposed beneath the buoyant valve for normally supporting said valve in an open position out of engagement with the valve seat, said baffle member comprising a pair of discs disposed in abutting engagement with one another, each of said discs having bores extending therethrough, the bores of the two discs having adjacent communicating ends and being angularly disposed relative to one another.

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