

E. L. M. SIVARD.
 SELF RIGHTING AND SELF BAILING BOAT.
 APPLICATION FILED DEC. 28, 1908.

1,050,045.

Patented Jan. 7, 1913.

5 SHEETS—SHEET 1.

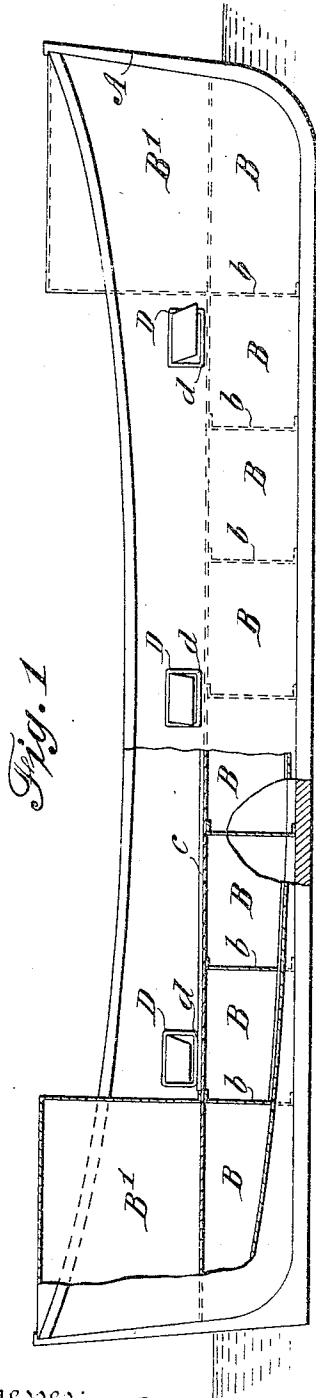


Fig. 1

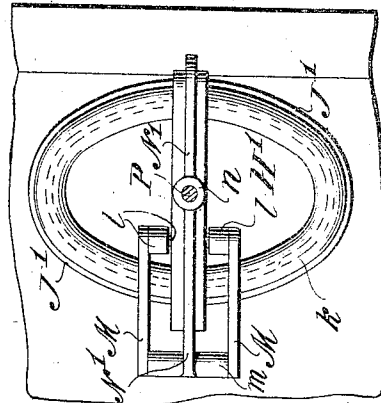


Fig. 5^a

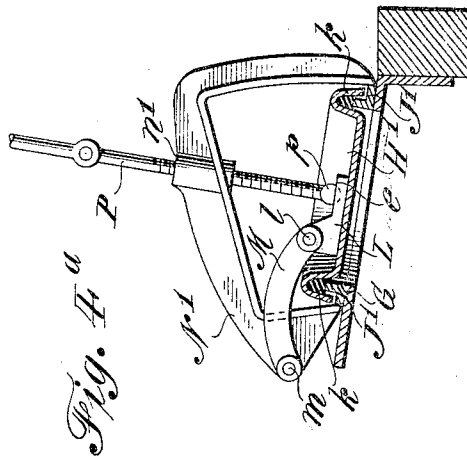


Fig. 4^a

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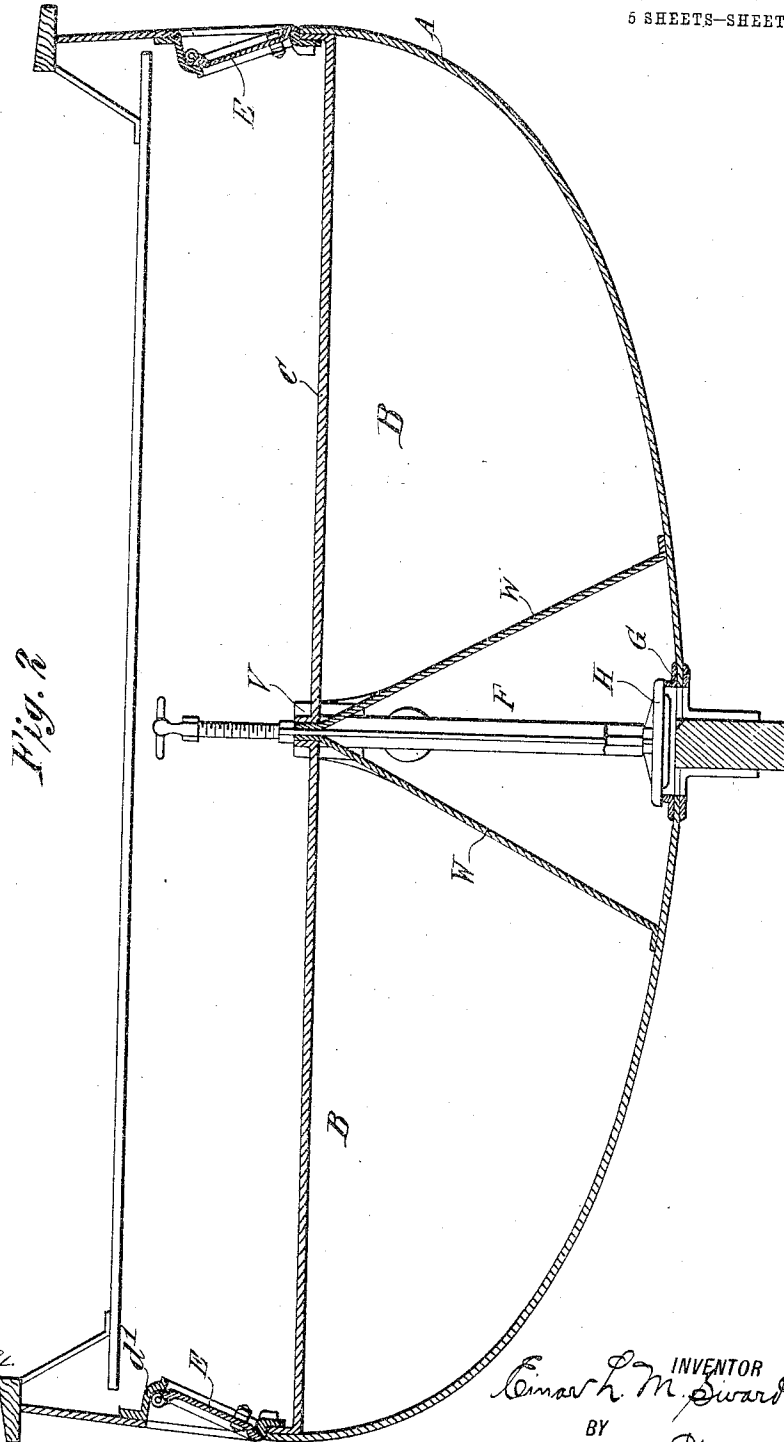


Fig. 2

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5 SHEETS-SHEET 3.

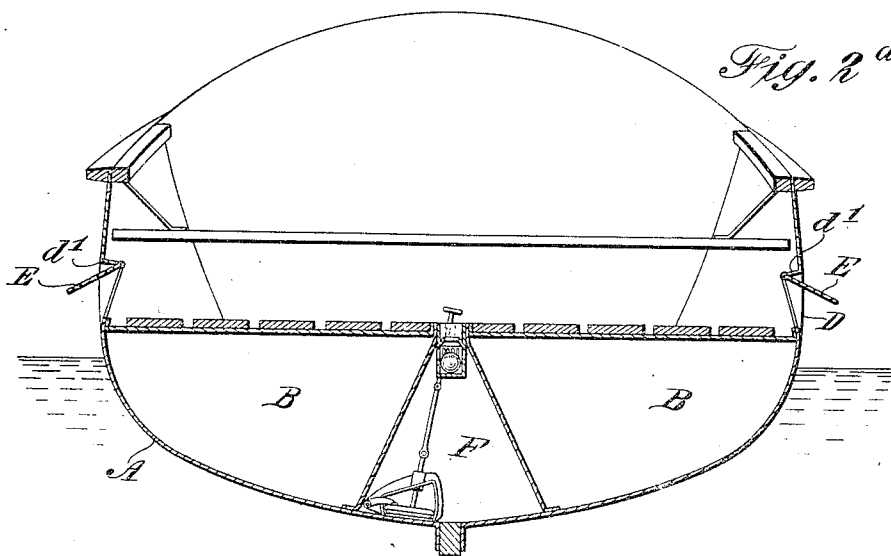


Fig. 2^a

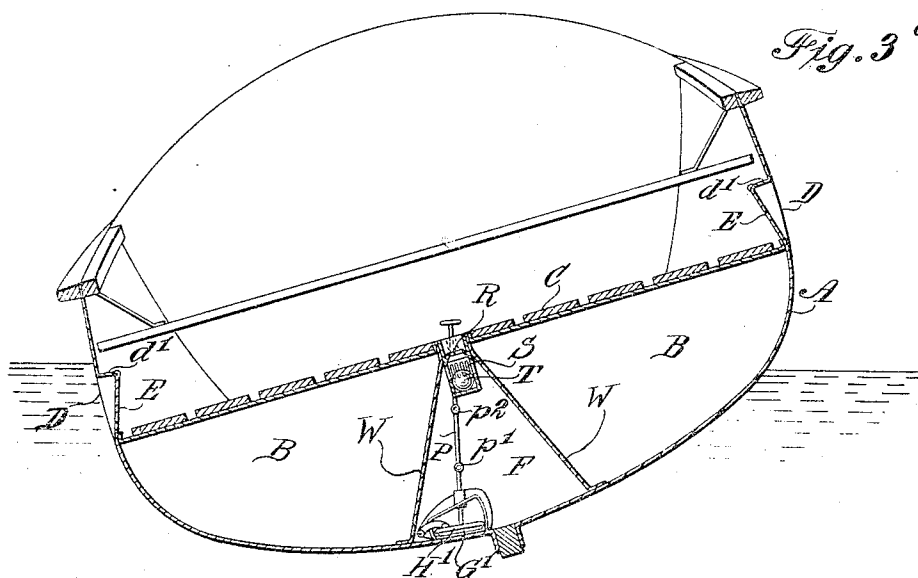


Fig. 3^a

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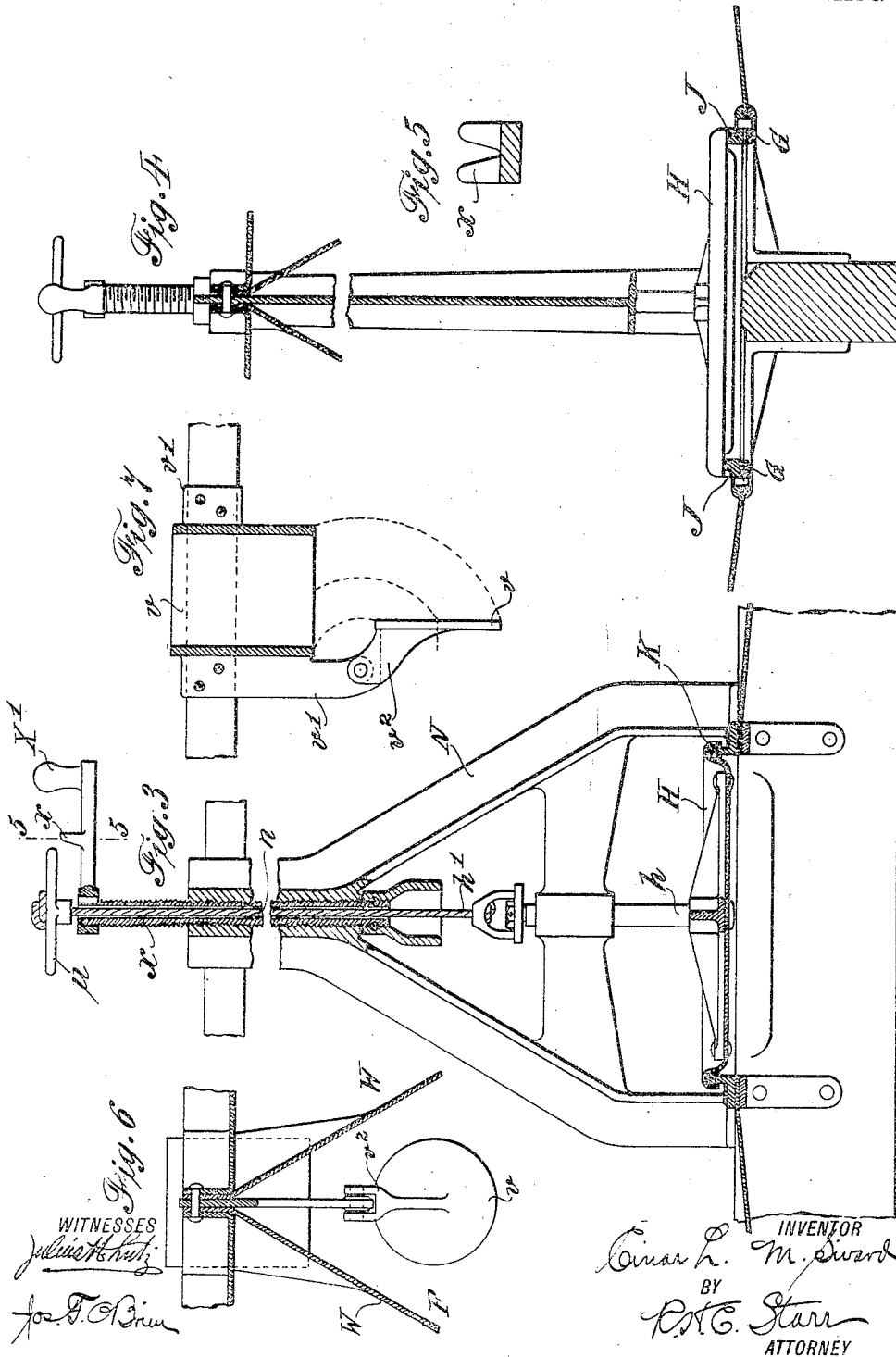
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

Fig. 8

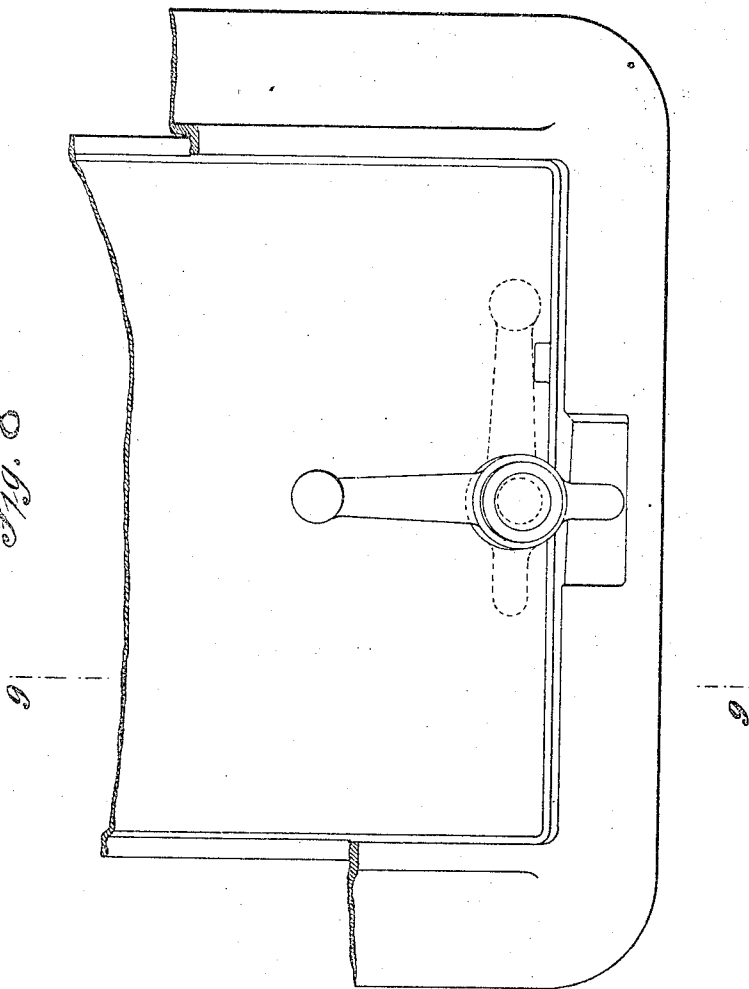
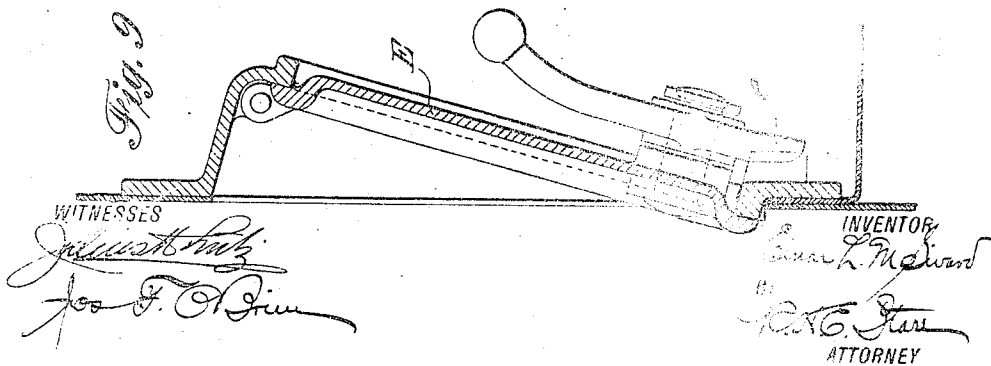


Fig. 9



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UNITED STATES PATENT OFFICE.

EINAR L. M. SIVARD, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS,
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SELF-RIGHTING AND SELF-BAILING BOAT.

1,050,045.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed December 28, 1908. Serial No. 469,677.

To all whom it may concern:

Be it known that I, EINAR L. M. SIVARD, a subject of the King of Sweden, and residing in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Self-Righting and Self-Bailing Boats, of which the following is a full, clear, and exact description.

My invention relates to improvements in self-righting and self-bailing boats, and is especially adapted for lifeboats and vessels of comparatively small size, which for various reasons are compelled to go through rough water.

In the accompanying drawings, in which similar reference characters designate corresponding parts, Figure 1 is a side view partially broken away of a boat embodying the preferred form of my invention; Fig. 2 is a cross-section of the same; Figs. 3, 4 and 5 are details of the automatic filling valve mechanism shown in Fig. 2; Figs. 6 and 7 are details of an air valve to be used in conjunction with said automatic filling valve; Fig. 8 is a detail view of the automatic bailing devices shown in Fig. 2 with a latch applied to the gate; Fig. 9 is a section on the line 9-9 of Fig. 8. Figs. 2^a and 3^a are cross-sections of a boat embodying a modification of the valve mechanism; and Figs. 4^a and 5^a are details of the valve and accompanying mechanism shown in Figs. 2^a and 3^a.

Referring now to the preferred form illustrated in these drawings, A designates the boat, preferably constructed of metal, and provided, as shown, with a series of chambers B and B'. Depending upon the size of the boat and the circumstances under which it is used, either all or a greater or less number of these chambers B will be air chambers, which will prevent the boat from sinking, and together with the upper air chambers B', B' will insure the boat returning to its normal upright position even after it has been capsized.

C designates a deck of any suitable construction extending between the air chambers B', B' and above chambers B. This deck is also preferably made of sheet metal and is provided with ordinary longitudinally extending strips or slats of wood or other material separated from each other.

The chambers B are preferably located below the deck and extend longitudinally the entire length of the boat. The chambers B' are preferably located one at each end of the boat and above chambers B and the deck of the boat. The chambers B are separated from each other by transverse partitions 3, preferably of stiff metal, suitably secured at their top and bottom edges to the deck and to the bottom of the boat, and at one side edge to a centrally arranged tank hereinafter described, and at the other side edge to the side of the boat.

Referring now to Figs. 2, 2^a and 3^a, F designates a tank, having a shape triangular in cross-section, arranged over the middle of the boat, and intermediate the two series of chambers B arranged on each side of the vessel and also intermediate the deck and bottom of the boat. As shown, the tank or tanks F is or are separated from the chambers B, B by longitudinal partitions W, which should also preferably extend the entire distance between the tanks B', B' and which may be carried still farther or to the very ends of the boat. These partitions, arranged in an oppositely inclined position, will also act as braces and in conjunction with the transverse partition between air chambers B, B will give very greatly increased strength to the entire structure. They may be made of any suitable material, but preferably will be made of stiff metal. This tank F may be continuous, but preferably will be split up into several independent tanks by suitable partitions. In this tank I propose to carry water or other suitable liquid which will act as ballast or cargo, and by reason of the shape of the tank or tanks within which it is confined, will also act as an additional self-righting agency. Where I use one continuous tank I may fill it with fresh water which will serve for drinking purposes also, or I may fill it with salt water or another fluid either for ballasting and self-righting purposes only, or, for example, with oil either as cargo or for any other purpose. Where I split the tank F up into two or three tanks (which I prefer) I may carry fresh water in one and salt water in the others. For example, if I have three tanks I can carry any liquid for ballasting or self-righting purposes in the fore and aft tanks.

and drinking water in the center tank. Any suitable means for filling and emptying these tanks may be employed.

In the valve construction illustrated in Figs. 2, 3 and 4, I have shown an opening arranged in the bottom of each tank surrounded by a valve seat G and closed by a valve H. J designates a flange on the valve seat surrounding the opening and engaging, when the valve is closed, packing K arranged in an annular groove surrounding the valve H. As shown a rod *h* is secured in any suitable manner at its lower end to the center of the valve H and slides up and down within a suitable opening provided therefor in a suitable support, such as a casting N rigidly secured to the bottom of the tank. Such rod serves as a guide for the valve H and permits it to open and close automatically according to the amount of pressure upon its outer or inner faces. Thus, when the boat is lowered into the water, the pressure on the outer face of the valve will cause it to open and admit water into the tank. When, however, there is more pressure on the inside than on the outside of the valve, or whenever the water has a tendency to escape from the tank, the pressure from the inside and the suction of the escaping water will cause the valve to close and keep the water in. Connected to the upper end of rod *h* is a rope or other flexible connection *h'* which passes up through the deck of the boat and is provided with a suitable handle U to permit the valve to be lifted off its seat when it is desired to let the water out of the tank or tanks during the operation of lifting the boat out of the water. In such event, the valve may be held in open position by any suitable means, such as by placing the rope *h'* between cleats *x* suitably located adjacent thereto. As shown, (Fig. 3) the rope *h'* passes up through a bore *n* formed in the center of a screw X. This screw X is suitably supported in the top of the tank and adapted to engage a valve rod *h* to positively close the valve, when for any reason, such as the carrying of fresh water, it is desired so to close such valve and to retain the same in closed position. Said screw X is operated by a suitable handle X' upon which the valve cleats *x*, as shown, are formed. In case, under any circumstances, the valve H should get stuck or difficulty be experienced in opening it to let the water out, the screw X may also be used positively to lift the valve. To accomplish this it is only necessary to fix the rope to the cleats as aforesaid and turn the screw upwardly. Also arranged in the top of the tank F at any suitable point and communicating with the atmosphere is an air-escape opening controlled by a valve of any suitable construction adapted to permit the egress of air during the automatic filling of the tanks

with salt water; to permit the filling of the tanks directly, if it is desired to carry fresh water, oil or other suitable cargo, and preferably so arranged that when the boat is in its normal position the valve will be entirely open, but so soon as the boat capsizes or tilts far enough in either direction so that water or other liquid has a tendency to escape from the tank through such valve, it will close. Of course, the end of the opening communicating with the deck may be closed by a plate, lid or other suitable closure of any ordinary kind, if desired.

When it is desired for any reason to clean out the tank or tanks the cleansing fluid may be injected through the opening in the top of the tank and allowed to flow outward through the valve in the bottom thereof which will be opened for that purpose, or vice versa.

As illustrated in Figs. 2, 6 and 7, a cylindrical tube V, open at both ends, leads from the deck to the tank F and is secured in the top of the tank by means of laterally extending flanges *v'*, *v'*. One of such securing flanges *v'* extends downwardly below the lower end of the tube V and a swinging valve *v* is pivoted thereto. Said valve *v* has a rearward projection *v*² forked to receive the downwardly-projecting portion of said flange. The web of the forked portion abuts against the lower end of the flange and limits the rearward swinging of the valve, so as to retain the same in a normally vertical position directly beneath the valve opening.

When the automatic filling and air-escape valves just described are in their normal positions, they will cooperate with each other under all conditions to admit water to the tank or tanks and to prevent the escape thereof.

In Figs. 2^a, 3^a, 4^a and 5^a I have shown modified forms of the automatic filling and air-escape valves. In these figures, I have shown an opening arranged in the bottom of each tank surrounded by a valve seat G' and closed by a valve H'. J' (Fig. 4^a) designates a flange on the valve seat surrounding the opening and engaging, when the valve is closed, packing *h* arranged in an annular groove surrounding valve H'. As shown, a stud L is secured to the top of each valve, to which is pivoted at *l* one end of a link M, the other end of which is pivoted at *m* to a casting N' rigidly secured to the bottom of the tank. P designates a valve rod passing through a bore *n'* arranged in the casting N', which bore is interiorly screw threaded. That portion of the valve rod P which passes through the bore *n'* is exteriorly screw threaded to engage and coast with the threading on the interior of the bore. *p'* and *p*² designate two universal joints in the rod P which projects upward through the tank and out through

an opening in the top thereof and through the deck. At its upper end it is provided with a handle, wheel, or other suitable device to enable it to be easily rotated. Suitable packing will be arranged around the upper part of the rod P where it passes through the opening in the tank. The valve rod P may have its lower end entirely disconnected from the valve and provided with a head *p*. On the other hand, the lower end of the valve rod may be connected at the point *p* to a lug at *l* in any suitable manner. Where the tanks are being merely used for salt water, it will be preferable to have the valve rod disconnected. By doing this, the valve rod can be screwed up to its raised position away from the valve, and the weight of the valve and the weight of the water inside will prevent any water flowing out when the boat tilts, but will allow water to come in. This also permits the automatic filling of the tank by merely lowering the boat. Under some circumstances, it may be more desirable to connect the rod to the valve so as to enable the same to be opened by the valve rod from inside the boat. Arranged in the top of the tank F is a separate opening R leading into a valve chamber S. This valve chamber will preferably be made of metal having in its upper portion a series of apertures *s* and carrying in its lower portion a ball T of such diameter as to fit snugly within the cylindrical valve chamber. When the boat is in its upright position the ball will be in the bottom of the valve chamber and the openings *s* uncovered. Should the boat capsize, or tilt far enough in either direction to permit of the egress of water from the tank the ball will slide upward in the valve chamber and close the openings *s*, thus preventing any water getting out of the tank or tanks F. It will also be understood that these openings *s* will always permit the escape of air when the tank is being filled through the automatic filling device, by merely lowering the boat in the water. When the down rod P is disconnected and raised out of engagement with the valve, the valves H and S will work together under all conditions. While the boat is being lowered in the water, and the tanks being filled, the upper valve will be wide open to permit the escape of air and the lower valve will be open to permit water to rush in. Whenever either during the filling action or after the completion thereof the boat tilts sufficiently far or assumes such a position that the water in the tank has any tendency to escape from the lower valve, that valve will close automatically, keeping in the water, and if the boat tilts sufficiently far so that the water may have any tendency to escape through the upper valve, that will likewise close, thus preventing the escape of either

water or further air. Owing to the peculiar shape of the tank or tanks F, the filling may be accomplished, even in rough water, without endangering the stability of the boat. In fact, the motion of the boat in rough water will, when the automatic filling device is used, assist in filling the tank to its full capacity. It will be obvious that, owing to such peculiar shape, the higher the water in the tank, the greater will be the stability of the boat.

D designates one or more, but preferably a series, of automatic bailing devices arranged on each side of the boat. As shown, each of these devices comprises an opening having its lower edge *d* substantially flush with the deck C to permit of any water which has accumulated on the deck flowing outboard through these openings on whichever side the boat may tilt. To prevent the waves from coming in through these openings an automatic closure of any suitable form may be used. In the preferred form illustrated in my drawings I accomplish this by carrying the upper wall *d'* of the opening D inward and securing at its inner edge a pivoted or swinging gate or valve E. If the boat were always to retain the absolutely level position shown in Fig. 2, this inward extension *d'* would not be necessary. As shown in Fig. 3^a, however, whenever the boat lists heavily to one side, it is essential that the gate E be pivoted at a point sufficiently far within the hull to keep the gate closed unless forced open and outward by the outward flow of water from the deck. Of course, if the boat tilts so far as to submerge a portion or the whole of such gate, the pressure of the water outside the boat will of itself keep the gate closed unless the pressure of the water inside is greater than that of the outside, when it will open to permit water to run out. In other words, in constructing a boat in accordance with my invention it will be so made that the closures for the openings shall always remain closed, excepting when opened to let out water which is inside the boat. Under some conditions it may be desirable to retain the gates E in permanently closed position, and for this purpose, I have provided each gate with a latch *e* which, during the ordinary operation of the lifeboat, will remain in open position.

Assuming the tank or tanks F to be full, the operation of my invention is as follows: If the boat capsizes, the air-escape valve will close the air-escape opening and the combined action of the air chambers B, the upper air chambers B', and the water ballast in tank or tanks F, will result in the boat righting itself and returning to a normal upright position. At the same time any water which has accumulated on the deck of the boat will be spilled outward through the

self-bailing appliances D. Furthermore, any undue tilting of the boat will be largely overcome by the action of the tank or tanks F carrying fluid. Moreover, if it is desired to raise the boat out of the water it can be lightened materially by merely opening the valves H, thus letting the water in the tanks F run out as the boat is raised.

I claim:

- 10 In a self-righting boat, the combination with air-tight compartments on each side thereof, of a longitudinally-extending tank having sides inclining from the bottom of the boat toward the center line of the deck
15 so as to form a tank substantially triangular in cross-section, a valve in the bottom of the

tank adapted to open automatically to admit water thereto and to close to keep the water in, and an independent air-escape valve normally retained in open position to permit the escape of air during the filling of the tank and adapted to close to retain water within the tank when the boat is cap-sized.

In witness whereof, I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

EINAR L. M. SIVARD.

Witnesses:

ANNA S. BROMBERG,
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