Nov. 19, 1929. N. S. HARTER 1,736,155

COLLAPSIBLE AIR CHAMBER SEAT

Filed May 19, 1927 2 Sheets-Sheet 1

Fig-1

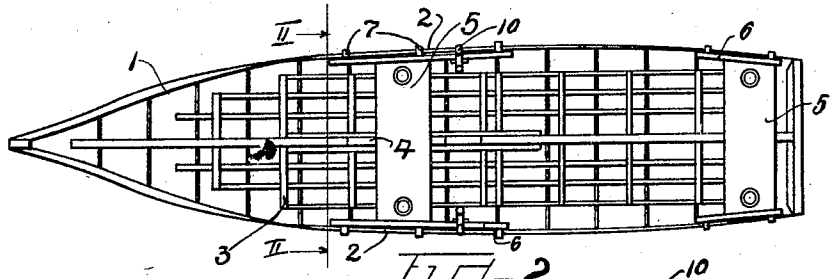


Fig-2

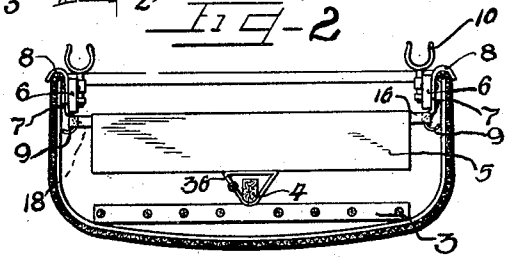


Fig-3

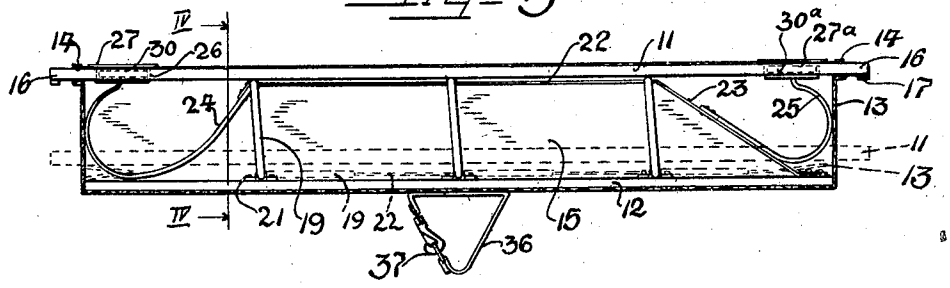


Fig-4

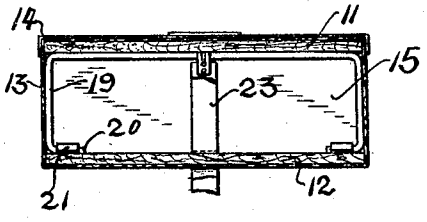
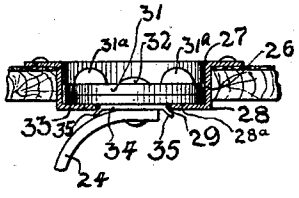


Fig-5



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Fig-6

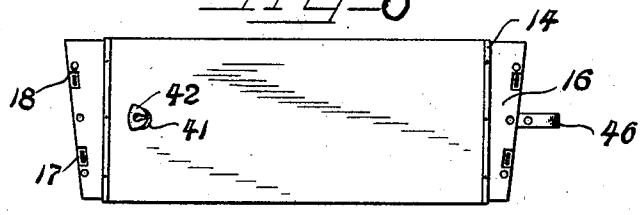


Fig-7

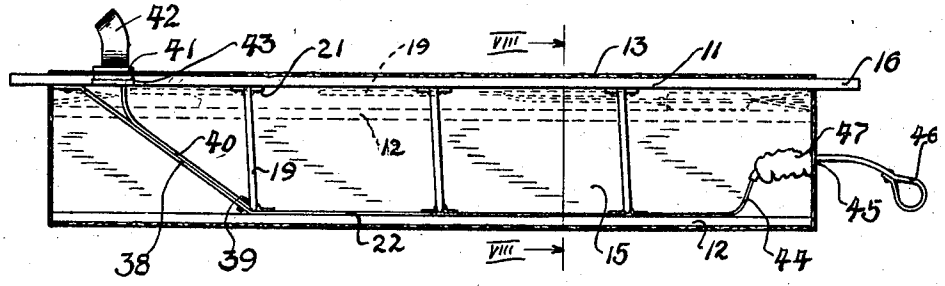
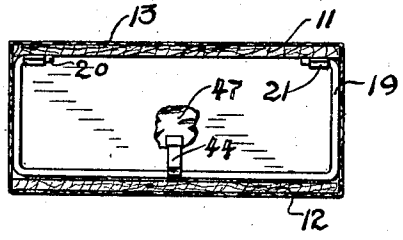


Fig-8



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Patented Nov. 19, 1929 1,736,155

UNITED STATES PATENT OFFICE

NOAH S. HARTER, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO KING BOAT COMPANY, A COPARTNERSHIP CONSISTING OF NOAH S. HARTER, ERNEST H. HARPER, A. F. BEAUBIEN, HARRY CHAPMAN, AND WALTER BILHARS

COLLAPSIBLE AIR-CHAMBER SEAT

Application filed May 19, 1927. Serial No. 192,586.

This invention relates to improvements in collapsible seats for any of their uses or purposes, and more particularly to a collapsible seat, automatically inflatable upon extension, particularly adapted for installation in a boat or the like for increasing the buoyancy and preventing the sinking of the same, and highly desirable for use with collapsible portable boats, and which is adapted to function as an effective and dependable life-saver in case of emergency.

Heretofore in collapsible air chamber seats it has been necessary to inflate them with air from the lungs or by small pumps, objectionably slow and laborious methods. Moreover, to insure the occupants of a boat against danger in case of accident, it has been the custom to provide the boat with built-in air chambers, thereby adding greatly to the expense of producing the craft.

With these objections in view it is accordingly an object of this invention to provide an automatically inflatable and collapsible seat.

Another object of this invention is to provide a portable air chamber seat adapted for installation in a boat or the like for preventing the same from sinking.

Still another object of this invention is to provide a light-weight collapsible seat having an air chamber therein which is automatically inflated simultaneously with the adjusting of the seat to its operative position.

A further object of this invention is to provide an air chamber seat for boats or the like, the air chamber of which occupies only space that would otherwise be wasted.

A still further object of this invention is to provide a collapsible air chamber seat adapted to keep a leaky or partially filled boat afloat sufficiently to carry passengers and permit the boat to be propelled.

On the drawings:

Figure 1 is a top plan view of a device embodying principles of this invention shown positioned in a boat.

Figure 2 is a vertical sectional view taken substantially on a line II—II of Figure 1.

Figure 3 is an elevation of the device itself with a portion of the covering removed.

Figure 4 is a vertical sectional view taken substantially along line IV—IV of Figure 3.

Figure 5 is a sectional view of a portion of the device.

Figure 6 is a top plan view of another form of the device embodying principles of the present invention.

Figure 7 is a view in elevation of the device shown in Figure 6 with a portion of the covering removed.

Figure 8 is a vertical sectional view taken substantially along line VIII—VIII of Figure 7.

As shown on the drawings:

In the illustrated embodiment of this invention there is shown a boat 1 having the usual gunwales 2 thereon, and provided with a floor rack 3 and keel 4. The boat 1, as shown is of a collapsible type but the present invention, as will be obvious from the disclosures hereinafter, is adaptable for use with any type of boat.

The present invention concerns itself principally with a safety seat 5 and means for mounting the same within a boat. The mounting means for the seat 5 comprises a pair of sideboards 6 to each of which is secured a plurality of stiffened hooks 7. The hooks 7 have a bent portion for engagement over the gunwales 2, and a bent portion 9 for engagement with the seat 5 in a manner hereinafter described. If the sideboards 6 are for a center seat they, of course, may be supplied with the usual oar locks 10, and if they are for an end seat the oar locks are usually omitted.

The collapsible seat 5 comprises a top board 11 and a bottom board 12 which are entirely covered by a water-proof material 13, preferably canvas treated with a water-proofing compound, which is held in place by bands 14 secured to the top board 11. This material 13 as shown in Figure 3 forms substantially the sides and ends of the seat 5 and incloses therein an air chamber 15. The top board 11 extends laterally on each side beyond material 13 to provide integral supporting flanges 16, which are shaped to correspond to the tapering sides of the boat 1, and which are provided with a metal strip 17 having

a series of apertures therein for engagement with the portion 9 of the double hooks 7, the supporting flanges 16 being recessed as shown at 18 adjacent the apertures in the strip 17. The seat 5 may be thereby securely held in suspended position by the hooks 7.

Within the air chamber 15 there is provided a plurality of angularly bent supporting rods 19 which are provided with inwardly bent tips 20 hingedly secured to the bottom board 12 by engagement with the straps 21 secured to the bottom board. These supporting rods 19 are connected at their tops by a flexible strip 22, which strip is connected at one end to a flexible tension strip 23, secured to the bottom board 12, which limits the pivotal movement of the rods. Due to the strip 22 interconnecting the supporting rods 19, the same are actuated uniformly and simultaneously. Attached to one end of the strip 22 is a flexible pull cord 24, preferably a strip of heavy canvas, and attached to the tension strip 23 is a similar pull cord 25.

Secured in circular openings 26 provided in the top board 11 and covering 13, is a pair of flanges 27 and 27ª, which are alike in construction, so only one will be described herein. The flange 27 has a downwardly depended portion 28 apertured as shown at 29, and integral therewith and extending inwardly a short distance from the circumference of the aperture 29 is a pair of projections 28ª which are diametrically opposite each other and each of which is substantially one quarter the circumference in length. An improved water-tight air-valve or stop plug 30 is provided for covering the apertures 29 and comprises a metal disc 31 having a plurality of integral upwardly projecting members 31ª which are diametrically opposite each other and provide gripping means for turning the stop plug. Secured to the disc 31 by rivets 32 is a disc gasket 33, preferably of rubber. In juxtaposed relationship to the gasket 33 there is a thin metal disc 34 which has depending therefrom a pair of clamping members 35 arcuately bent to conform substantially to a screw thread and adapted for engagement with the inwardly extending portions 28ª of the depending part 28 of the flange 27. Since these clamping members 35 are of substantially one quarter the circumference of the disc 34 the stop plug is tightly secured over the aperture 29 by a quarter turn. A similar plug 30ª is provided within the other flange 27ª. The pull cord 24 is secured to the stop plug 30 by rivets 32, and pull cord 25 is similarly secured to the stop plug 30ª.

Attached to the bottom of the seat 5 adjacent its midportion is a plurality of straps 36 provided with snap hooks 37 or equivalent securing means for engaging the strap with the keel 4, as shown in Figure 2, to positively hold the seat in position within a boat and to prevent the seat from becoming separated from the boat in case the latter is overturned. In the collapsible boat 1 shown in the drawing the straps 36 are engaged to the keel 4, but if it is desired to use the seat in a non-collapsible boat the straps 36 obviously are engaged with the keel or keelson of such a boat, as the case may be.

In operating the device described herein, assuming it is desired to collapse the device from its inflated postion as shown by the solid lines in Figure 3, the stop plug 30ª is removed and the pull cord 25 affixed thereto is given a slight tug or pull, thereby causing the supporting rods 19 to pivot within the sleeves 21 and assume a horizontal position, and the flexible side walls 13 due to the weight of the top board 11 thereon will cave in, and the device will assume the compact position shown by the dotted lines in Figure 3, the air contained in the chambers 15 passing out through the flange 27ª. The pull cord 25 is then pushed back through the opening 29 and the stop plug 30ª inserted therein, and the device is now ready for storage or transportation. To assemble the device from its deflated or collapsed position the stop plug 30 is removed and a slight tug is exerted on the pull cord 24 which causes the members 19 to assume their upright position at the same time forcing the top board 11 up into spaced relationship to the bottom board 12 and straightening the caved-in side walls 13. Simultaneous with this operation the device is inflated by air passing through the aperture 29. It is to be especially noted that the supporting rods 19 pass slightly beyond an exact vertical position and remain inclined a trifle towards the pull cord 24. They are prevented from dropping by the tension strip 23 and the seat is thereby adapted to withstand great pressure exerted on the top board 11 without collapsing. If the seat is in its inflated position the pull cord 24 is pushed back through the opening 29 of the flange 27 and the stop plug 30 secured therein. The stop plugs 30 and 30ª are positively water-tight due to their novel construction.

The form of this invention disclosed in Figures 6 to 8, inclusive, differs from the form disclosed in Figures 1 to 5, inclusive, only in the positioning of the interior supporting rods 19 and the pull cords. In this form of the device the supporting rods 19 are in inverted position relative to the previously described form, and their inwardly bent tips 20 are connected in straps 21 affixed to the underside of the top board 11. A tension strip 38 is secured to the top board 11 adjacent one end thereof and passes around the nearest supporting rod 19 and is clamped upon itself by a rivet 39 to form a sleeve engaging the supporting rod. This strip continues from the rivet 39 to form a pull cord 40 connected

to a cork or plug 41 (preferably of rubber) and extending therethrough to provide a loop handle 42. The cork 41 is adapted for water-tight engagement with an aperture 43 in the covering material 13 and top board 11. Adjacent the opposite end of the seat, a pull cord 40 is attached to the flexible strip 22 and extends through an aperture 45 in the end wall of the material 13. This pull cord 44 is also provided with a handle 46. Around the pull cord 44 adjacent the aperture 45 in the interior of the covering 13, there is provided flexible water-tight packing 47 to prevent the entrance of water into air chamber 15.

The operation of this form of the present invention is substantially the same as previously described. Assuming the device to be in inflated position a tug on the handle 42 simultaneously disengages the cork 41 and exerts a tension on the pull cord 40 whereby the supporting rods 19 will collapse and the device will assume the position shown by the dotted lines in Figure 7, the air contained in the chamber 15 passing out through the aperture 43. To assemble the device it is only necessary to exert a pull on the handle 46 which forces the supporting rods against the bottom board 12 thereby forcing top board 11 upwardly, the device being automatically inflated by air passing through the aperture 43, after which the cork 41 is inserted in the aperture. It is to be noted that the supporting rods 19 also assume a slightly inclined position in this form of the invention and due to their inclination are prevented from swinging to the left (Figure 7) when pressure is exerted on the top board 11, and are prevented from swinging to the right by the tension strip 38.

Obviously, if for any reason it is not desired to use the device in its inflated position, or the air chamber is rendered unfit for use, the device will still function as the usual type of removable seat.

From the foregoing it is apparent that I have provided a novel collapsible air chamber seat adaptable for use in any boat or the like, as well as in various other ways, and which will prevent the sinking of the boat in which it is mounted whether or not the boat is overturned, which overturning could only be accomplished with great difficulty since the device due to its position within a boat tends to stabilize and prevent the overturning of same. Obviously too, the present invention affords means for keeping a leaky or partially filled boat afloat in stable condition without interferring with the operation of the same. Moreover, the device discussed herein is extremely light in weight, readily portable, easily operated and installed, is composed of a minimum of parts and may be manufactured at minimum expense.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention and I, therefore, do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. In a folding seat, a casing, a top member, a bottom member, both of said members being within said casing, a plurality of pivoted supports for said members, and means for limiting the movement of said supports.

2. A collapsible seat comprising a casing, a top member, a bottom member, and pivoted supporting members disposed between said top and bottom members within said casing.

3. In a collapsible seat, a top member, a bottom member and pivotally mounted supporting members disposed between said first mentioned members and adapted to retain the same in spaced relationship.

4. The combination with a collapsible seat comprising a casing, a pair of juxtaposed members therein, and supporting means between said members, of a pair of side boards removably associated with said seat, and means on said side boards for supporting the same within a boat.

5. A device of the character described, comprising a waterproof casing, a pair of juxtaposed members therein, pivoted supports between said members, and means on the bottom of said casing for securing the device to the keelson of a boat.

6. In a device of the class described, a top member, a bottom member, supporting rods between said members and pivotally secured to one of said members, and means for actuating said supporting rods.

7. In a device of the class described, a pair of juxtaposed members, a plurality of supports between said members and hingedly secured to one of said members, a strip interconnecting said supports to permit simultaneous actuation of said supports, and means for actuating said supports.

8. In a collapsible seat, a par of spaced members, supports pivoted between said members, a flexible strip interconnecting said supports, and means including a pair of pull cords for actuating said members.

9. In a device of the class described, a pair of juxtaposed members, a plurality of angularly bent supporting rods therebetween and pivotally mounted on one of said members, a pull cord for elevating said rods to an upright position, means for retaining said rods in their upright position against pressure, and a pull cord for dropping said rods to their horizontal position.

10. A collapsible seat comprising a pair of juxtaposed members, supports interconnected and pivotally mounted between said members, a pull cord for elevating said supports into a position slightly inclined from the vertical,

a tension strip to prevent further pivotal movement of said supports, and a pull cord associated with said tension strip for dropping said supports.

11. In a collapsible seat, a casing, a pair of spaced members therein, said casing and one of said members having a pair of aligned apertures therethrough, stop plugs engageable in said apertures, supports between said members, a pull cord for elevating said supports secured to one of said plugs, and a pull cord for dropping said supports secured to the other of said plugs.

12. In a device of the class described, a casing having a pair of apertures therein, a pair of juxtaposed members within said casing, a plurality of supporting rods pivotally mounted between said members, a strip interconnecting said rods, a pull cord secured to one end of said strip, a tension cord secured to the other end of said strip and affixed to one of said members, a pull cord secured to said tension strip, said pull cords extending through said apertures, and means for maintaining said apertures water-tight.

13. The combination with a collapsible air chamber seat having an aperture in the top thereof, of flanges in said apertures, and a stop plug engageable in said flange and comprising a metal disc, a gasket adjacent thereto, a second metal disc adjacent said gasket, a pair of clamping members depending from said second mentioned disc and engageable with projections on said flange to form a water-tight closure.

14. In a device of the class described, a casing having apertures therethrough and containing an air chamber therein, flanges in said apertures, inwardly projecting members in said flanges, and a stop plug engageable in said flanges comprising a metal disc, a gasket, and a relatively smaller metal disc, and clamping members depending from said second metal disc engageable with said projecting members, said clamping members being arcuately shaped to conform substantially to a screw thread.

15. In a collapsible device, a casing, means within said casing for expanding said device, and means connected to said first mentioned means extensible without said casing for actuating said first mentioned means.

16. In a device of the character described, a casing having an aperture therein, a pair of spaced members in said casing, one of said members having an aperture therein in alignment with the aperture in said casing, removable sealing means for said apertures, pivotal means in said casing between said members, and means connected to said sealing means for actuating said pivotal means to further separate said members when said sealing means are removed, air entering said casing through said apertures.

17. In a device of the character described, a flexible casing, a top member therein, a bottom member therein, pivotal means between said members, means connected to said pivotal means for actuating the same and expand said casing, and means connected to said pivotal means for actuating the same for collapsing said casing.

18. As an article of manufacture, a collapsible seat including a flexible casing, a pair of spaced members therein, movable means between said members, means for actuating said movable means to expand said casing by further separating said members, and means for actuating said movable means for collapsing said casing, there being means to admit air to said casing simultaneously with the actuation of said second mentioned means, and there being means permitting the egress of air from said casing simultaneously with the actuation of said third mentioned means.

In testimony whereof I have hereunto subscribed my name.

NOAH S. HARTER.