

Jan. 20, 1959

C. E. MANHART
RAFT-BOARDING AID

2,869,150

Filed Nov. 26, 1957

4 Sheets-Sheet 1

FIG. 1

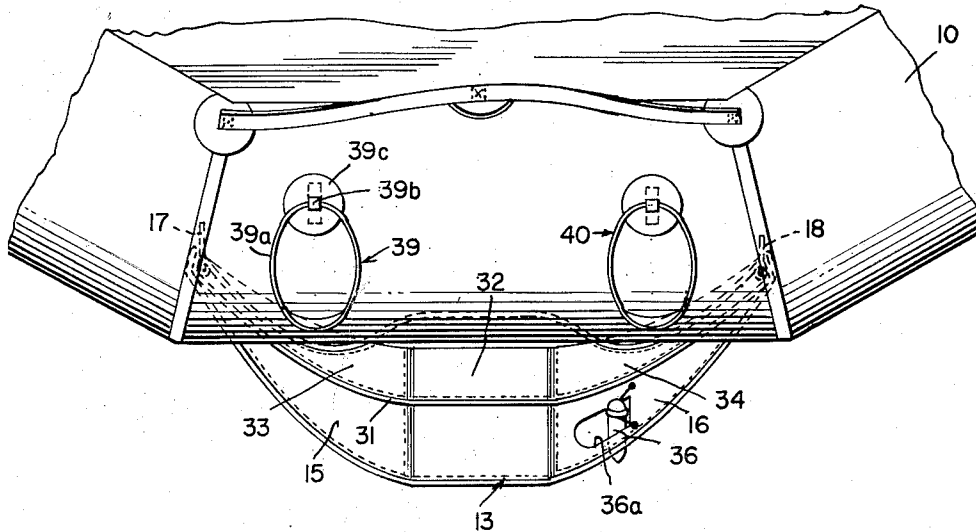
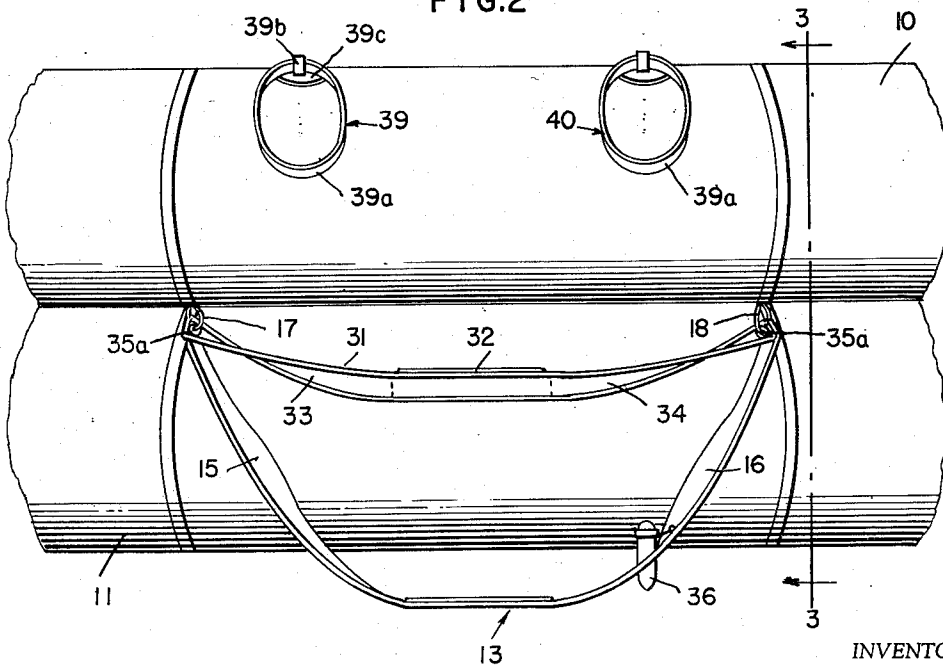


FIG. 2



INVENTOR

Charles E. Manhart

BY

Arthur Nissen

ATTORNEY

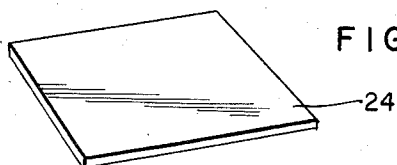
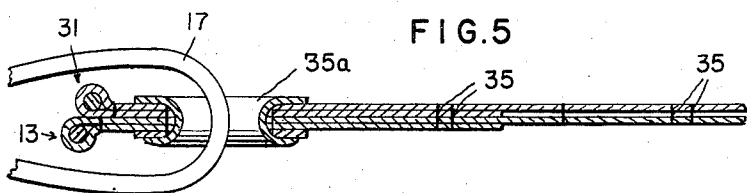
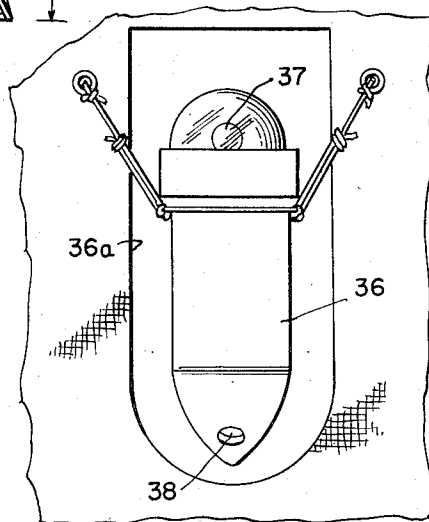
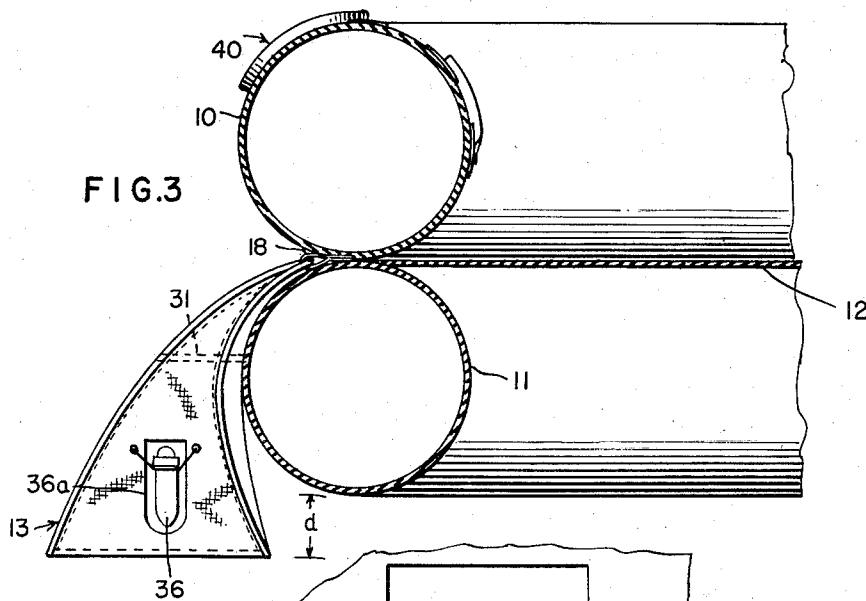
Jan. 20, 1959

C. E. MANHART
RAFT-BOARDING AID

2,869,150

Filed Nov. 26, 1957

4 Sheets-Sheet 2



INVENTOR

Charles E. Manhart

BY

Arthur Middleton

ATTORNEY

Jan. 20, 1959

C. E. MANHART
RAFT-BOARDING AID

2,869,150

Filed Nov. 26, 1957

4 Sheets-Sheet 3

FIG. 7

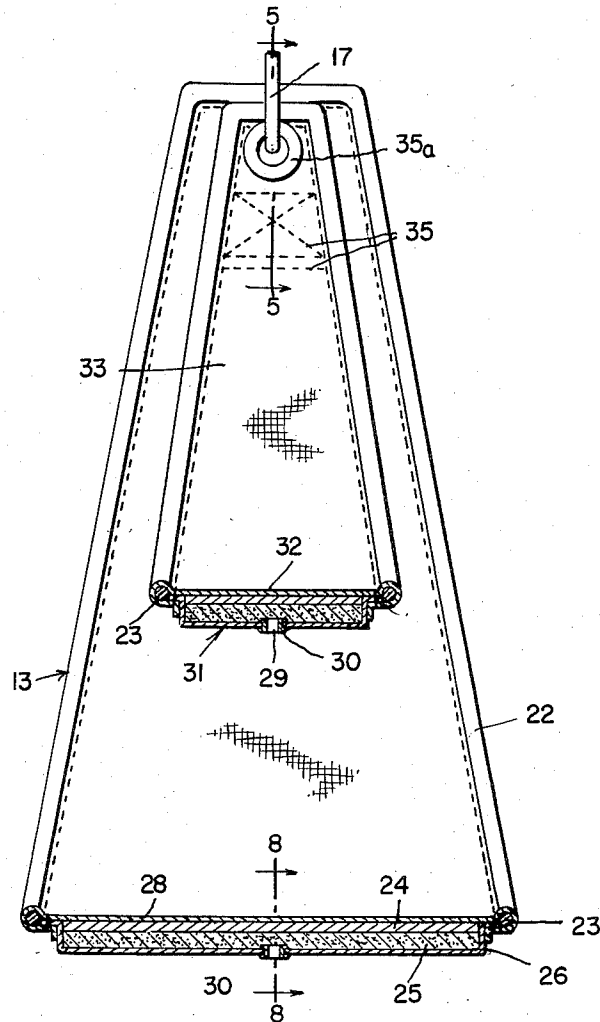


FIG. 8

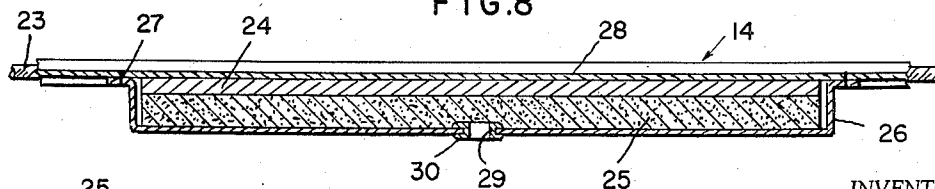
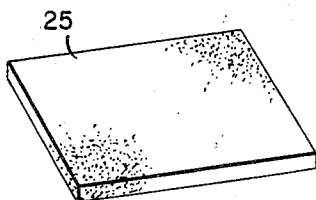


FIG. 9



INVENTOR
Charles E. Manhart

BY

Arthur M. Mollen

ATTORNEY

Jan. 20, 1959

C. E. MANHART
RAFT-BOARDING AID

2,869,150

Filed Nov. 26, 1957

4 Sheets-Sheet 4

FIG. II

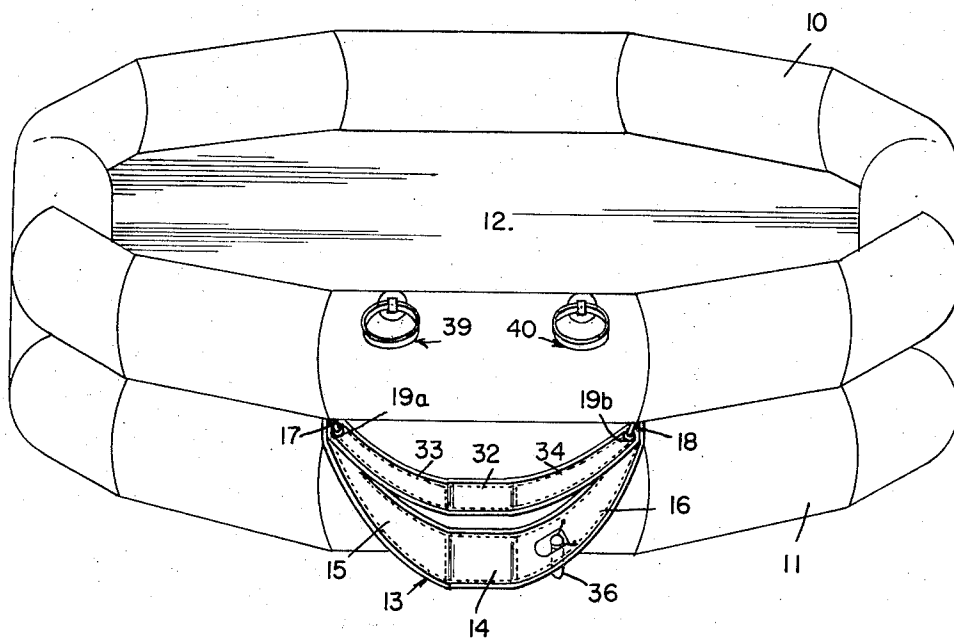
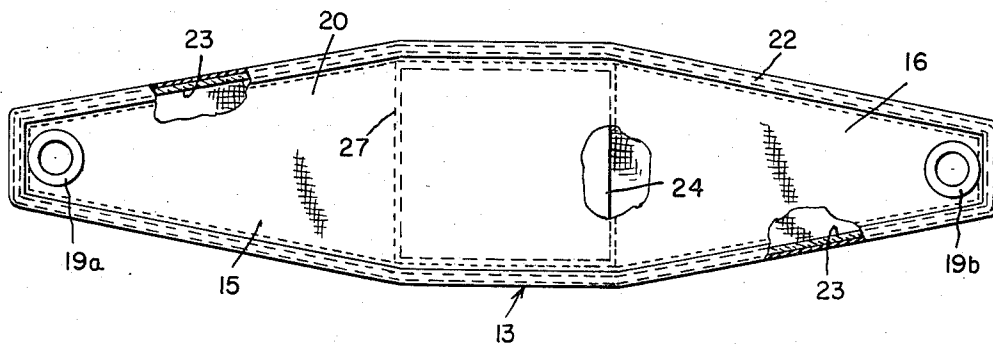


FIG. 10



INVENTOR.

Charles E. Manhart

BY

Arthur Anderson

ATTY

1

2,869,150

RAFT-BOARDING AID

Charles E. Manhart, Miami, Fla.

Application November 26, 1957, Serial No. 699,069

14 Claims. (Cl. 9—11)

This invention relates to inflatable life rafts such as are carried by ocean-flying aircraft for use when ditching takes place, and more particularly to means secured to the raft for aiding survivors of the ditching who are in the water around the raft to board the same.

In more detail, this invention contemplates the use of such a boarding aid in conjunction with a raft that has a side wall structure in the form of a pair of endless inflated tubular members joined tangentially together with one superposed upon the other, and which is provided with a flexible intermediate deck or bottom secured sealingly to the side wall structure along the line of tangential juncture of the members, so it will be immaterial which side of the raft faces upwardly when it hits the water.

Such a raft may have considerable free board height which, in a practical case, may be in the order of 30 inches and thus high enough to make it difficult if not impossible for exhausted surviving persons in the water to board the raft unassisted.

Previous boarding aids such as rope ladders even though with rigid rungs depending into the water were found to be unsatisfactory and were difficult to negotiate for persons in conditions of distress or exhaustion. Another problem is that such a boarding aid must be very compact when in a package with the raft before inflation so as to occupy a minimum of stowage space in an airplane obligated to carry such a raft. Also, there is the further requirement that the boarding aid must become properly operable and serviceable immediately the raft has hit the water and has become inflated from an attached source or cylinder of compressed gas supply, irrespective of which side of the raft is facing upwardly. Also, it is important that the boarding means be such that it can be easily located by survivors in the water and then be negotiated with a minimum of effort and in coordination with the most effective leverages of the human anatomy.

This invention provides an improved and highly effective boarding aid of great simplicity and compactness to meet these problems and to overcome the difficulties heretofore encountered with prior boarding aids. The present device provides a rigid shelf built into a flexible web structure which has a pair of lateral wing portions, which may be tapered, extending from respective side edge portions of the shelf, with the narrow or pointed ends of the wing portions secured to the raft at respective points disposed along the aforementioned line of tangential juncture.

When installed in accordance with the concept of this invention, the device provides a pocket with a flat rigid bottom; that is a rigid shelf suspended by the flexible wing portions which in turn are so constructed and dimensioned that the shelf under the weight of the person mounting it will cause the wing portions to be twisted from the plane of the shelf so as to follow the curvature of the tubular member to the line of juncture. The wing portions thus hug the curvature of the lower member in

2

face-to-face relationship therewith, while holding the shelf itself braced in a position only a short distance below the surface of the water where the person mounting it may first assume a kneeling position on the shelf, which comes easy while grasping with both hands a pair of flexible loops or handles secured to the upper tubular member above the shelf. From this kneeling position upon the shelf, the person may continue hoisting himself while placing first one foot and then the other securely upon the shelf, and finally swinging himself in any convenient manner across the upper member or gunwale of the raft.

According to one feature, the shelf comprises a weight-sustaining plate combined with a slab of buoyant material enclosed between layers of the web structure which, if spread out into a single plane presents the geometrical shape which comprises the substantially square intermediate body portion of the shelf and a pair of tapering end portions or wings in the form of slender triangles pointing laterally in opposite directions from the body portion. The web structure is reinforced all along the periphery of this geometrical shape by means of a linear flexible element such as twisted nylon rope enclosed in the peripheral welt of the web structure, with the plate disposed between parallel portions of the rope.

In a preferred form of the invention, a pair of shelves each enclosed in its respective web structure are nested one within the other. In this arrangement each pair of juxtaposed wing portions has a common point of suspension at the juncture line, the arrangement being such as to present a pair of shelves or treads one above the other, with the additional upper tread braced edgewise against the outward bulge of the associated member of the raft.

In the drawings:

Fig. 1 is a detail top view showing the shelf structure of the boarding aid in conjunction with a portion of the inflated raft to which they are secured, including a self-contained electric locating light carried by the structure.

Fig. 2 is a side view of the boarding aid shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on line 2—2 of Fig. 2 showing more clearly the location of the shelf slightly below the bottom of the raft, and the positioning of the locating light.

Fig. 4 is a greatly enlarged view of the locating light shown in Fig. 3.

Fig. 5 is a greatly enlarged sectional view illustrating the connection between the boarding aid and the raft, taken on line 5—5 of Fig. 7.

Fig. 6 is a perspective view of a component plate of the shelf structure.

Fig. 7 is a vertical sectional detail of the boarding aid showing an upper view of the suspended shelf structure nested in a lower suspended shelf structure, both shelf structures having common points of suspension.

Fig. 8 is an enlarged cross-sectional view of the lower shelf taken on line 8—8 of Fig. 7, showing more clearly the combination of a solid shelf plate with a slab of buoyant material.

Fig. 9 is a detail perspective view of the buoyant slab in Fig. 8.

Fig. 10 is a developed plan view of the basic shelf structure, particularly showing outline and details of the web structure embodying the shelf.

Fig. 11 is a perspective view of the inflated raft showing the general location of the boarding aid thereon.

The novel boarding aid of this invention is herein illustrated in a practical embodiment in which it is secured in a special manner to an inflatable raft which of itself is known to have a wall structure comprising a pair of endless inflated tubular members, and an intermediate deck or bottom sealingly secured to the wall structure along the line of tangential juncture of the tubular members

3

with one another. This raft therefore is of the kind that will be operative irrespective of which side thereof is facing upwardly.

The present invention provides a novel boarding aid for such a raft secured thereto in the particular manner best illustrated in Figs. 3 and 11, in such a manner as to adjust itself in operative position irrespective of which side of the raft faces upwardly.

Referring for instance to Figures 10 and 11 illustrating a simple form of the invention, the raft with which the boarding aid is connected and which may be constructed of rubber-coated nylon sheeting comprises a pair of inflated endless substantially identical tubular members 10 and 11 with one superposed upon the other and sealingly secured to one another along their tangential line of juncture, and an intermediately disposed deck or bottom 12 of flexible material such as rubber-coated nylon sheeting sealingly secured to the wall structure along the tangential line of juncture of the inflated members.

In the simple form illustrated in Fig. 11 the boarding aid comprises a suspended shelf structure 13 comprising a platform or shelf 14 proper and a pair of wing portions or web portions 15 and 16 extending from respective side edges of the shelf or plate 14. These wing portions 15 and 16 as seen from Fig. 11 have their plane twisted 90 degrees so that their outer end portions will conform to and hug the curvature of the lower tubular member 11 thus reaching into the bight formed by the tubular members at their line of juncture, where they are secured as by a pair of anchoring loops 17 and 18 provided at respective spaced points along the line of juncture. It will be understood that these anchoring loops may be constructed of a suitable tough strap material rubberized and vulcanized to the tubular members at the line of juncture in the manner indicated in Figures 1, 2, 3, the loops each extending through a metal grommet such as at 19^a and 19^b provided at the respective ends of the wing portions 15 and 16.

More in detail, the boarding aid in one embodiment thereof (see Fig. 10) comprises a web structure 20 of suitable sheet material which may be vinyl plastic coated nylon cloth, shaped to comprise an intermediate substantially square body portion and the wing portions 15 and 16 in the form of slender triangles as they appear in the developed view of Fig. 10, with the aforementioned grommets 19^a and 19^b provided at the tip of the triangles.

The web structure 20 has a peripheral welt 22 all around which encloses a linear reinforcing element 23 preferably in the form of twisted plastic rope of polyethylene extending all along the periphery.

The intermediate body portion of the web structure 20 has embodied in it stiffening means to provide the shelf 14 comprising a solid plate 24 which may be of a moisture-resistant pressed wood composition such as Masonite combined with a slab of buoyant material 25 associated with the underside of the plate, which slab may be in the nature of a plastic foam product or blown plastic such as Styrofoam made of styrene. As shown more clearly in Figures 7 and 8, the shelf plate with attached buoyant slab is contained in a pocket 26 of the aforementioned web material stitched all around as by a seam 27 to the sheet material 28 of the web structure. A breather hole 29 is provided in the wall of the pocket reinforced by a grommet 30. The plate in the pocket is thus disposed between parallel stretches of the linear reinforcing element in the welt.

According to the embodiment of Figures 1, 2, 3, 7, 8, the boarding aid comprises an additional or auxiliary suspended shelf structure 31 of a construction substantially like that of the main shelf structure 13 above described and nested therein in the manner illustrated in the drawings. That is to say, the auxiliary shelf structure 31 presents a secondary shelf or step 32 of smaller horizontal transverse dimension than that of the main shelf below, with a pair of web portions or wing portions 33 and 34

4

correspondingly shaped and having their ends stitched as at 35 to the corresponding end portions of the main shelf structure, and grommets 35^a further holding them together.

The view in Fig. 3 shows more clearly the mutual relationship and disposition of the two shelves or platforms when in use, in that the lower shelf is disposed at a short distance below the bottom line of the raft, whereas the upper shelf is set back relative to the lower shelf, and braces itself against the outward bulge of the lower tubular member of the raft.

It will now be understood that when the raft is afloat, the shelves and particularly the lower shelf will float on the surface of the water due to the buoyance of the built-in slab of buoyant plastic foam material, so as to be within sight and easy reach of survivors in the water attempting to board the raft. To facilitate locating the boarding aid for survivors in the dark of night, the main shelf structure carries a locating light 36 suspended in an aperture 36^a of one of the wing portions of the shelf structure. This locating light more clearly shown in the enlarged detail of Fig. 4 is in the form of a self-contained unit producing current to light an electric light bulb 37 upon contact with the water communicating with the interior of the unit as through an opening 38 in the housing of this unit.

Associated with the boarding aid so far described is a pair of identical handles 39 and 40 secured to the upper tubular member near the gunwale of the raft. Each of these handles in the preferred form herein shown comprises a flexible ring 39^a of suitable strap of high strength fabric enclosed in plastic sheeting, such as cotton web covered with coated nylon sheet material stitched to the web. Each ring 39^a is held in a suitably constructed anchoring loop 39^b which together with an anchoring pad 39^c is vulcanized to the gunwale of the raft.

When the raft is afloat, a survivor in the water in order to board the raft may first get a hold of the suspended shelf structure which he finds floating on the water, and from there grasp either one or both of the handles 39 and 40 to hoist himself preliminarily into position to place his knees upon the main shelf submerging the same to the extent shown in Fig. 3.

From this kneeling position and a firm hold on the handles above it is a relatively simple matter for the survivor to rise further by first placing one foot and then the other upon the shelf upon which he is kneeling followed by mounting onto the auxiliary shelf before stepping into the raft.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

I claim:

1. The combination with an inflatable life raft of the type having as a sidewall structure a pair of inflated endless tubular members one of which is superposed upon the other, with an intermediate deck secured sealingly to the side wall structure along the line of tangential juncture of the members, a boarding aid in the form of a suspended shelf structure which comprises a substantially rigid plate member, and a pair of wing portions each in the form of a flexible web each extending from a respective side edge of the plate member, the outer ends of the wing portions being secured to the raft at respective points along the line of juncture at the outside of the raft, said shelf structure when weighted being disposed adjacent to the bottom of the lower inflated member with the flexible wing portions in face to face contact with the curvature of the inflated member.

2. The invention according to claim 1, wherein the side edges of the wing portions converge.

3. The invention according to claim 1, wherein the side edges of the wing portions converge, and the ends

5

are provided each with a reinforcing eye for attachment to the raft.

4. The invention according to claim 1, wherein the shelf is a buoyant member.

5. The invention according to claim 1, with the addition of a pair of loop-shaped straps secured to the upper tubular member to serve as handles above the shelf.

6. The invention according to claim 1, with the addition of a second suspended shelf structure having a plate member nested within the first shelf structure and suspended jointly therewith with the plate members of both shelf structures spaced vertically from one another, the upper plate member adapted to be braced against the bulge of the inflated member, the upper plate member being dimensioned to overhang a portion of the lower plate member.

7. The invention according to claim 6, wherein at least the lower plate member comprises a solid plate and a slab of buoyant material attached to the underside thereof.

8. The invention according to claim 7, wherein the slab is of plastic foam material.

9. The invention according to claim 1, wherein the shelf structure is formed with a welt all along the periphery containing linear flexible reinforcing means, said plate member disposed between parallel portions of the reinforcing means.

10. The invention according to claim 1, wherein the shelf structure is formed with a welt all along the periphery containing a twisted rope of polyethylene.

11. A boarding aid securable to a life raft of the in-

6

flatable character, which comprises a buoyant rectangular plate member, an elongate web structure of pliable material of the class comprising rubber-impregnated nylon fabric having a rectangular intermediate portion and tapering end portions substantially in the form of slender triangles extending from opposite sides of the intermediate portion, said plate being embodied in the intermediate portion for stiffening the same, a welt formed all along the periphery of said web structure and containing linear flexible peripheral reinforcing means, and the plate member being disposed between parallel stretches of the linear reinforcing means.

12. A boarding aid according to claim 11, wherein the plate member comprises a pressed wood plate and a slab of buoyant blown polyethylene.

13. A boarding aid according to claim 11, wherein the plate member is contained in a pocket stitched to the intermediate portion of the web structure.

14. A boarding aid according to claim 11, with the addition of a secondary web structure having a plate member substantially similar in construction to the first web structure with plate member except for being narrower in width as well as shorter in length than the first structure, and the respective ends of the web structures being joined together face to face by stitching with a grommet provided in each of the end portions thus joined.

References Cited in the file of this patent

UNITED STATES PATENTS

1,174,594 McGiff ----- Mar. 7, 1916