March 10, 1931. N. STRAUSSLER 1,795,976

COLLAPSIBLE STRUCTURE AS SEAPLANE FLOATS, PONTOONS, AND THE LIKE

Filed June 14, 1930

Fig. 1.

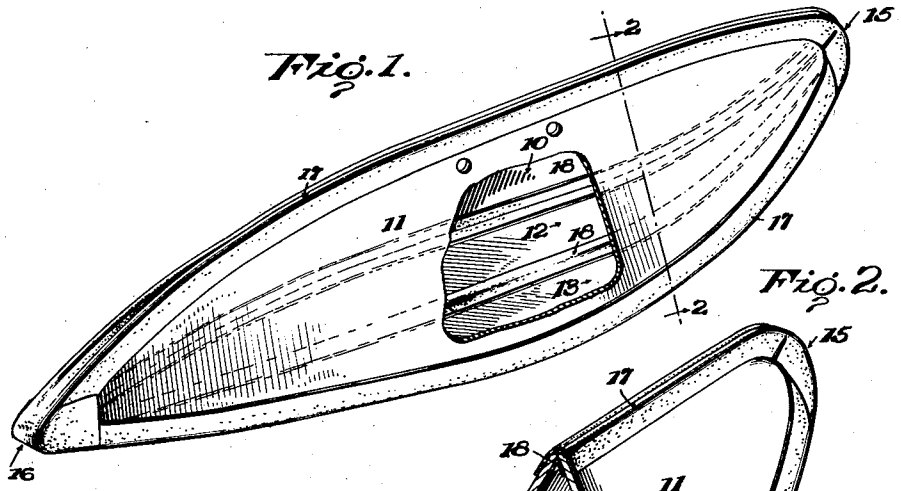


Fig. 2.

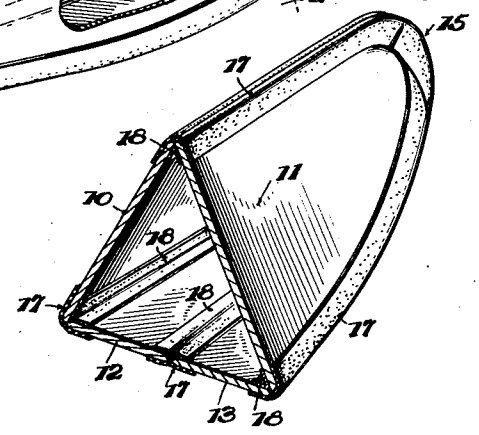


Fig. 3.

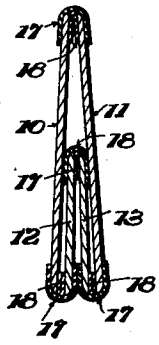
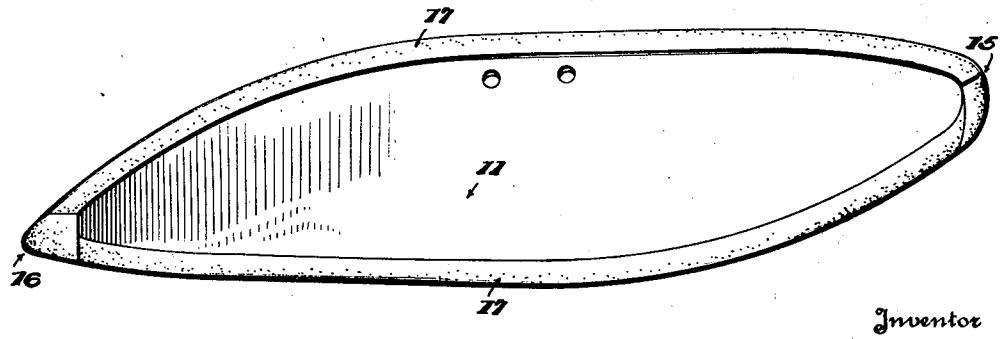


Fig. 4.



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UNITED STATES PATENT OFFICE

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COLLAPSIBLE STRUCTURE AS SEAPLANE FLOATS, PONTOONS, AND THE LIKE

Application filed June 14, 1930. Serial No. 461,174.

This invention relates to collapsible structures such as seaplane floats, pontoons, and the like, and it has for an object to provide a structure of this character which can be readily collapsed into a substantially flat formation or opened into a buoyant structure of generally triangular cross section.

Another object of this invention is to provide a structure of the type characterized which is composed of a minimum number of parts that may be readily manufactured in quantity and easily assembled into a durable and readily manipulated structure.

Another object of this invention is to provide a hollow structure that is relatively buoyant and which is also adapted to be so collapsed that it may be packed flat for storage or transport, and thereby occupy a minimum of space, or in the case of a seaplane float, that it may offer the minimum air resistance.

Other objects will appear as the description of the invention proceeds.

The invention is capable of receiving a variety of mechanical expressions, one of which is shown on the accompanying drawings, but it is to be expressly understood that the drawings are for purposes of illustration only, and are not to be construed as a definition of the limits of the invention, reference being had to the appended claims for that purpose.

Referring in detail to the drawings, where the same reference characters are employed to designate corresponding parts in the several figures;

Fig. 1 is a perspective elevation of an embodiment of the present invention, one of the side panels being partly broken away for convenience of illustration;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is a transverse section of the parts in collapsed relation; and

Fig. 4 is a side elevation of the structure.

In the form shown, the collapsible structure is composed of four longitudinally continuous, relatively rigid panels 10, 11, 12 and 13, which extend the entire length of the structure and which may be composed of any suitable rigid or rigidly framed, or approximately rigid or rigidly framed, material that gives the requisite strength and stiffness to the structure and at the same time possess the desired lightness of weight. For example, said panels may be formed of ply wood, or sheet metal, or laminated wood and metal, and rivets or other suitable fastenings may be passed through the plies or laminations to prevent splitting apart or separation of the laminæ of wood or metal. If metal is used with wood, the metal may be used either as an interior layer or layers or as an outer sheath.

For convenience of fabrication, said panels are preferably made in pairs of like configuration, the lateral panels 10 and 11 being of the same size and having the same contour, and the panels 12 and 13 which constitute the folding third side of the structure also being of like size and contour. The two lateral panels 10 and 11 may have any suitable configuration to conform with the service to which the device is to be put, the shape shown in the drawings being suitable for use in an airplane float and having a configuration which is non-symmetrical with respect to both fore and aft and transverse axes. The two panels 12 and 13, on the other hand, together form a third side which is symmetrical with respect to a fore and aft axis. The configuration of the lateral panels 10 and 11 is such as to give the structure a form which tapers toward both ends, the degree of taper toward one end 15 being somewhat more abrupt than that toward the other end 16.

The four panels 10, 11, 12 and 13 are suitably connected together so that they may be collapsed into a flat formation, the third side preferably collapsing inwardly in a reentrant angle, as shown in Fig. 3, or opened up into a hollow, buoyant body having a generally triangular cross section, as shown in Fig. 2. Any suitable means for hingedly connecting the panels together and forming a watertight joint along the contiguous edges of said panels may be employed. For example, the joints may be made in the manner described and illustrated in my Patent No. 1,720,701, granted July 16, 1929, for collapsible structures such as pontoons and seaplane floats,

divisible into boats. As shown, each panel is connected with the adjacent panel by a strip 17 of flexible waterproof material, such as wax or rubber coated canvas or webbing, attached to said panels exteriorly thereof, and a like strip 18 disposed interiorly thereof. The outer edges of the panels are preferably curved transversely of their length as shown in Fig. 3, and the flexible strips lie snugly around the contiguous edges of the panels when in collapsed position, without imposing any tension on said strips transversely thereof, so that no strain is placed on said strips in collapsing and expanding the structure. These flexible strips 17 and 18 extend the entire length of each pair of contiguous edges of said panels and constitute a flexible or hinge connection therebetween, enabling said panels to be folded into the form shown in Fig. 3 or opened into the form shown in Fig. 2. To strengthen the joints, hinges may also be used at intervals, if desired.

When assembling the panels and strips, waterproof glue or other suitable waterproof adhesive is suitably applied between the strips and the panels to secure the strips to the panels and render the joint water-tight. The inner and outer strips 17 and 18 may then be stitched together along the line between the contiguous edges of the panels, so as to afford a hinge line, although this is not essential. The strips 17 and 18 thus form a waterproof casing for the edges of the panels, preventing access of water thereto to cause rotting, in the case of wood, or corrosion, in the case of metal. If desired, the strips may also be secured to the panels by tacks, rivets or other suitable fastening means at appropriate intervals.

In the case of seaplane floats, one or more suitable valves (not shown) are preferably provided at or adjacent the top of the structure to permit the rapid inward and outward passage of air during the collapsing or opening of the structure, this valve being of such a character as to prevent entry of water into the float when the seaplane is resting or traveling on the water. Means (not shown) will also be associated with the panels, for example levers as illustrated in my earlier patent above identified, which can be connected with and operated by suitable gearing on the seaplane, so that the panels may be collapsed into the form shown in Fig. 3, to reduce air resistance, while the plane is in the air, but opened up into the form shown in Fig. 2, when the plane is about to alight on the surface of the water.

It will, therefore, be perceived that a structure adapted for flotation has been provided which can be simply and inexpensively fabricated out of two pairs of like panels, made of a variety of materials to obtain the desired rigidity, strength and lightness, and which can be readily collapsed into flat form, as shown in Fig. 3, wherein the panels are in lateral or face contact, in which position they occupy a minimum space and facilitate packing for storage or transportation—or in the case of seaplane floats wherein they offer a minimum of air resistance—while they can with equal facility be opened up into the form shown in Fig. 2 wherein a maximum of buoyancy can be obtained for the size and weight of material employed. It will also be perceived that portable structures of this character are susceptible to a variety of uses, and can be used either with the folding third side uppermost or lowermost, depending upon the service to which the structure is put.

While the embodiment of the invention illustrated on the drawings has been described with considerable particularity, it is to be expressly understood that the invention is not limited thereto, as it is susceptible of a variety of expressions, some of which will now suggest themselves to those skilled in the art, while changes may be made in the details of material, construction, arrangement, and proportion of parts without departing from the spirit of this invention. Reference is therefore to be had to the claims hereto appended for a definition of said invention.

What is claimed is:

1. A collapsible structure adapted for floatation comprising a plurality of panels hingedly connected at their lateral contiguous edges to form a permanently connected unit which may be collapsed into flat formation or expanded into a formation of generally triangular cross section.

2. A collapsible structure adapted for floatation comprising two pairs of like panels hingedly connected into a permanent collapsible unit of generally triangular cross section, said panels being movable with respect to each other into substantially parallel relationship.

3. A collapsible structure adapted for floatation comprising two lateral panels of like configuration adapted to form two sides of a structure of generally triangular cross section, two panels of like configuration adapted to form the third side of said structure, and means hingedly connecting said panels whereby they can be moved into substantially parallel relationship.

4. A collapsible structure adapted for floatation comprising two lateral panels of like configuration adapted to form two sides of a structure of generally triangular cross section, two panels of like configuration adapted to form the third side of said structure, and flexible connections between said panels whereby they can be moved into substantially parallel relationship.

5. A collapsible structure adapted for floatation comprising two lateral panels of like configuration adapted to form two sides of a structure of generally triangular cross

section, two panels of like configuration adapted to form the third side of said structure, and means flexibly connecting said panels whereby they can be moved into substantially parallel relationship, said last named means including flexible strips secured to the adjacent edges of said panels and forming a fluid-tight joint therebetween.

6. A collapsible structure adapted for floatation comprising the lateral panels of like configuration adapted to form two sides of a structure of generally triangular cross section, two panels of like configuration adapted to form the third side of said structure, and means flexibly connecting said panels whereby they can be moved into substantially parallel relationship, said last named means including flexible waterproof strips attached to the adjacent edges of said panels interiorly and exteriorly thereof.

7. A collapsible structure adapted for floatation comprising longitudinally continuous and relatively rigid lateral panels flexibly connected along adjacent edges, and longitudinally continuous and relatively rigid panels flexibly connected together and to said lateral panels and forming with said lateral panels a third side of a hollow structure which is triangular in cross section.

8. A collapsible structure adapted for floatation comprising a pair of longitudinally continuous and relatively rigid lateral panels hingedly connected together along a pair of contiguous edges, and a pair of longitudinally continuous and relatively rigid panels hingedly connected together and to said lateral panels, said last named panels forming a collapsible third side of a hollow structure of triangular cross section.

9. A collapsible structure adapted for floatation comprising a pair of longitudinally continuous and relatively rigid lateral panels hingedly connected together along a pair of contiguous edges, and a pair of longitudinally continuous and relatively rigid panels hingedly connected together and to said lateral panels and forming the third side of a hollow structure of triangular cross section, said last named panels being movable into face contact with each other and with said lateral panels to form a relatively flat collapsed structure.

10. A collapsible structure adapted for floatation comprising a pair of longitudinally continuous and relatively rigid lateral panels hingedly connected together along a pair of contiguous edges, and a pair of longitudinally continuous and relatively rigid panels hingedly connected together and to said lateral panels and forming the third side of a hollow structure of triangular cross section, said four panels being collapsible into substantially parallel relationship.

11. A collapsible structure adapted for floatation comprising a pair of longitudinally continuous and relatively rigid lateral panels hingedly connected together along a pair of contiguous edges, and a pair of longitudinally continuous and relatively rigid panels hingedly connected together and to said lateral panels and forming the third side of a hollow structure of triangular cross section, said hinged connections being formed by a flexible material extending lengthwise of the contiguous edges of said panels and forming a water-tight joint between said panels.

12. A collapsible structure adapted for floatation comprising a pair of longitudinally continuous and relatively rigid lateral panels hingedly connected together along a pair of contiguous edges, and a pair of longitudinally continuous and relatively rigid panels hingedly connected together and to said lateral panels and forming the third side of a hollow structure of triangular cross section, said hinged connections comprising flexible waterproof strips attached to the contiguous edges of said panels interiorly and exteriorly thereof and forming a water-tight joint therebetween.

13. A collapsible structure adapted for floatation comprising lateral panels adapted to form two sides of a structure of generally triangular cross section, means hingedly connecting said lateral panels together, two panels adapted to form the third side of said structure, and means hingedly connecting said last named panels together and to said lateral panels and enabling said last named panels to be collapsed inwardly and said lateral panels to be collapsed toward each other.

14. A collapsible structure adapted for floatation comprising lateral panels of like configuration adapted to form two sides of a structure of generally triangular cross section, means hingedly connecting said lateral panels together, two panels of like configuration adapted to form the third side of said structure, and means hingedly connecting said last named panels together and to said lateral panels, said last named panels being collapsible into a reentrant angle with respect to said lateral panels.

15. A collapsible structure adapted for floatation comprising longitudinally continuous and relatively rigid lateral panels flexibly connected along adjacent edges, and longitudinally continuous and relatively rigid panels flexibly connected together and to said lateral panels and forming with said lateral panels a third side of a hollow structure which is triangular in cross section, said last named panels being movable into folding relation between said lateral panels.

In testimony whereof I have signed this specification.

NICHOLAS STRAUSSLER.