

H. W. BROADY.
LIFE RAFT.
APPLICATION FILED JAN. 4, 1919.

1,422,657.

Patented July 11, 1922.

Fig. 1.

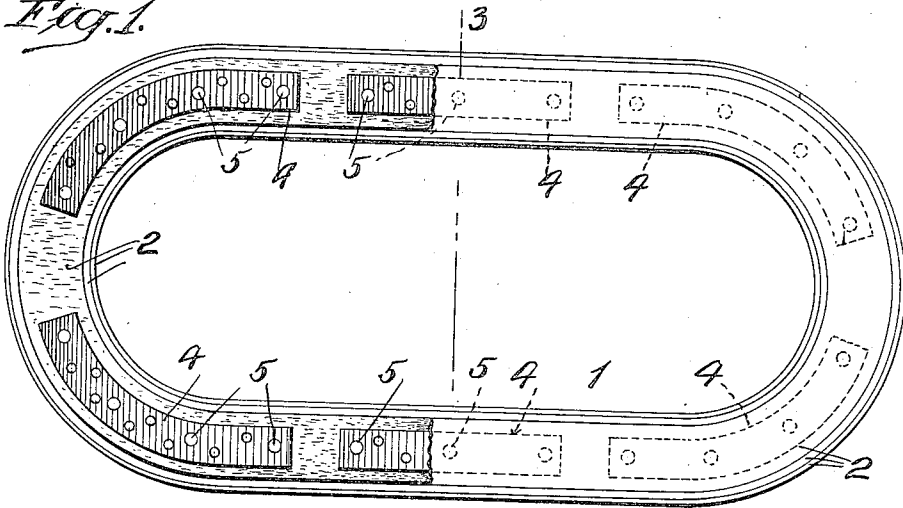


Fig. 2.

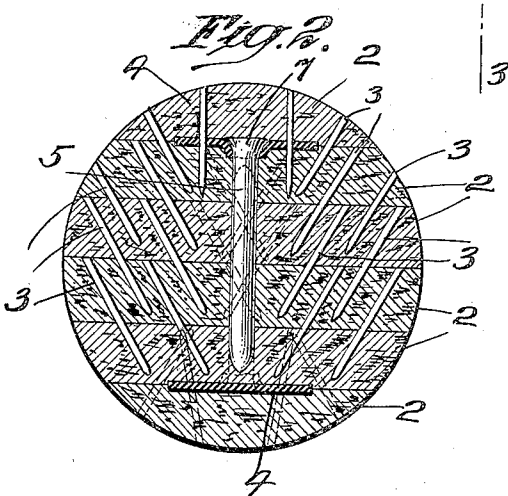


Fig. 4.

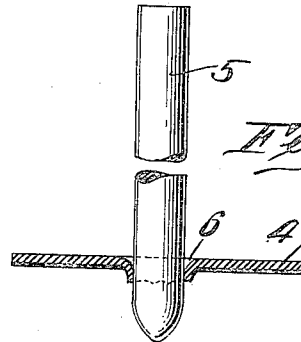


Fig. 5.

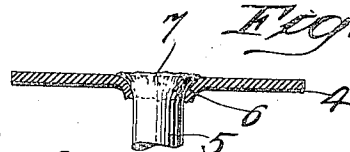
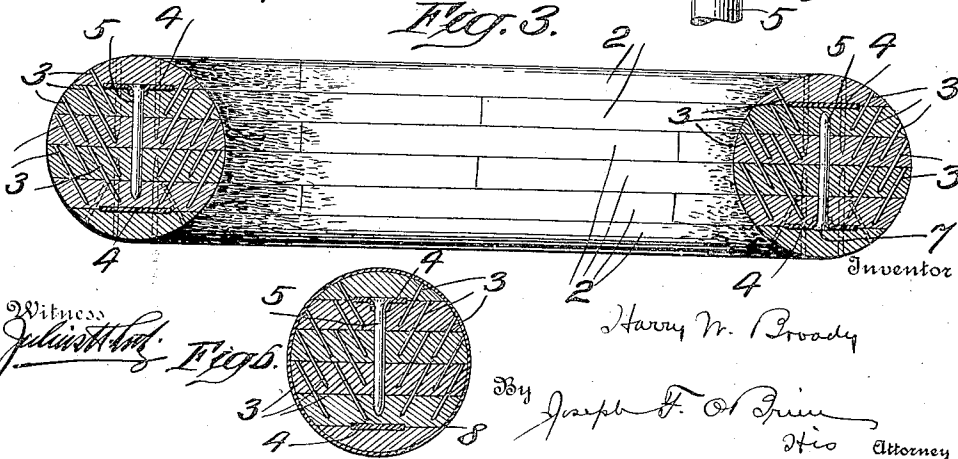


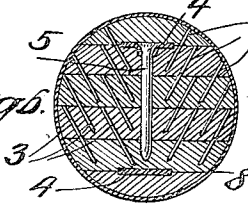
Fig. 3.



Witness

Julius H. [Signature]

Fig. 6.



Harry M. Broady

By

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His Attorney

UNITED STATES PATENT OFFICE.

HARRY W. BROADY, OF BAYSIDE, NEW YORK, ASSIGNOR TO AMERICAN Balsa
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LIFE RAFT.

1,422,657.

Specification of Letters Patent.

Patented July 11, 1922.

Application filed January 4, 1919. Serial No. 269,691.

To all whom it may concern:

Be it known that I, HARRY W. BROADY, a citizen of the United States, and a resident of Bayside, borough of Queens, county of Queens, and State of New York, have invented certain new and useful Improvements in Life Rafts, of which the following is a specification.

This invention relates to improvements in life rafts.

The objects of my invention are to produce a life raft which will have a maximum of buoyancy relatively to its weight and size and will therefore have great carrying capacity; which because of its lightness, may be easily handled and unshipped in case of emergency and may be hung up, in series, and supported in position for launching by gravity without excessively straining the supports on shipboard; which will be sufficiently strong and durable to withstand shocks due to striking the water when launched or unshipped; which may be punctured or broken in places without materially lessening or destroying its buoyant qualities and efficiency and which even if broken cannot be sunk, and will have considerable life-saving value. I produce a raft possessing these qualities by the use of a wood of light specific gravity such as balsa wood which has been subjected to treatment by paraffin to make it water-proof and preserve it preferably in accordance with reissue patent to Marr, 13,952. My said raft is preferably made of a body of said wood substantially cylindrical in cross-section and preferably has the shape or contour of a continuous or endless oval ring, so that when the same is launched by gravity or dropped overboard from a ship, it will present no corners to the water which are likely to be broken off or injured. In practice, the cylinder forming said oval-ring raft is built up of a series of parallel layers of balsa or like wood to produce a solid body or structure. To secure solidity of structure and prevent relative movement between the layers, it is desirable to fasten each board or layer of wood to the adjacent board or layer. It is undesirable to use the conventional metallic screws for fastening these boards together because in the first place, the large number of fastening devices necessary for this purpose would increase the weight of the raft;

secondly, the soft, pithy, cellular structure of this light wood is not sufficiently dense and tough to provide sufficient local strength, tenacity and friction surface to retain such metallic fastening devices effectively, and thirdly, the paraffin causes the fastening device to be lubricated, so that the same soon works loose. I have found that dowels of a harder wood procure a better frictional grip with the cellular structure of the balsa wood than does metallic fastening devices, but even these hard wood dowels, if driven in the usual way through adjacent layers, likewise have but little effect of holding the boards together. I have therefore found it necessary to utilize a plurality of these dowels arranged in what I shall term "wedging relation" to each other; that is to say, one dowel is driven into the parallel surfaces of two or more layers to be connected at an angle to the surfaces to be connected at one side of a perpendicular to such surfaces, and another dowel is driven through such parallel surfaces at an angle to such surfaces through the same layers or boards from the opposite side of such a perpendicular, the said dowels preferably being inclined in opposite directions to a vertical plane passing through the axis of the cylindrical body of the raft. Such an arrangement of the dowels produces a wedging or keying effect and prevents relative movement of the boards or layers in any direction.

While a raft of the character above specified has considerable structural strength and resistance to shocks caused by unshipment or dropping the same into the water by gravity, I have found it desirable to reinforce the balsa wood body, and for this purpose, I have embedded in the cylindrical body formed as aforesaid, a series of flat metallic plates, preferably composed of galvanized steel. These plates are preferably arranged between superimposed layers of such wood and preferably between the top layers or caps and the intermediate layers on opposite sides of the axis of said cylindrical body. A plurality of such plates are employed and they are preferably disposed at each of the curved portions between the short ends and the long sides thereof and also are preferably disposed in the long sides intermediate said curved portions. The

plates where the layers are fastened together become embedded in the opposing surfaces of the layers of soft wood between which they are arranged. In addition to embedding these plates between the boards or layers of balsa wood as aforesaid, I also preferably fasten or anchor them to the said body by wooden dowels in such a manner as to prevent shearing by such plates of the

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dowels. By punching suitable dowel apertures through a plate so that the metal punched through will form an outwardly-extending burr on the plate, I am enabled to drive or hammer through such apertures dowels of suitable wood and the wall of the burred aperture will prevent a shearing of the dowel by the plate when the raft is subjected to shocks. Furthermore, the hammering of such dowels causes the top thereof to be flattened and form a head which seats in the punched opening above described. A connection between a dowel and plate so formed, therefore, provides an effective connection between such reinforcing metal plates and the balsa wood body.

Other objects of my invention will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

30 This invention accordingly also consists in the features of construction, combinations of parts, and in the unique relationship of the members and in the relative proportioning and disposition thereof, all as more completely outlined in the following specification and in said drawings.

To enable others skilled in the art so fully to comprehend the underlying features of my invention that they may embody the same by numerous modifications in structure and relationship of parts contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure, and in such drawings like characters of reference denote corresponding parts throughout all the views, of which:—

Fig. 1 is a plan view of a raft embodying my invention, part of the top layer or cap being broken away to expose the reinforcing plates;

Fig. 2 is an enlarged section through one side of the raft illustrating in cross section the cylindrical body and the method of fastening the layers together and also the method of fastening the plates to said body.

Fig. 3 is a section on the line 3—3 of Fig. 1, illustrating in cross section opposite sides of said raft, and in elevation the end of said

60 raft;

Fig. 4 is an enlarged detail of a reinforcing plate and dowel being driven there-through;

Fig. 5 is a similar detailed view of the

hammered through the opening therein with its head seated upon the walls of the punched up and burred opening; and

Fig. 6 is a cross section, showing the finished raft enveloped by a canvas covering.

Referring now to these drawings, 1 indicates a raft which, as shown, is in the shape of an endless oval or ring, and all parts of said ring are, as illustrated, cylindrical in cross section. The ring shape of said raft is desirable because of its great strength and also because dropping the raft into the water by gravity, no corners are presented to the water which are likely to be broken off or injured. In practice, the said raft is preferably built up of a series of flat parallel layers or boards 2 of a wood of very light specific gravity such as balsa wood, and these layers are fastened together, as shown, by wooden dowels 3, which are preferably driven into and through adjacent parallel surfaces of the layers or boards in such relationship to each other as to produce what I shall term a "wedging relation" that is to say, one dowel, or a series of dowels, is driven into the boards to be fastened at an angle to the parallel surfaces to be joined at one side of a perpendicular to such surfaces, and another dowel, or series thereof, is driven through such boards or layers also at an angle to said parallel surfaces on the opposite side of the perpendicular, and both dowels are preferably driven in a position inclined toward the center or middle of said two layers and to a vertical plane passing through the axis of the cylindrical body of the raft. This "wedging relationship" of the dowels produces an effective connection between the layers and prevents movement therebetween in any direction.

While the raft construction hereinabove described has considerable structural strength and will afford resistance to the shock caused by unshipping or dropping the same into the water by gravity under most conditions, I have found it desirable to reinforce this balsa wood body at various places with a tough material such as steel, and for this purpose I have embedded in the cylindrical body formed as aforesaid a series of flat metallic plates 4, preferably composed of galvanized steel, with the edges of these plates disposed parallel to a horizontal line passing through the axis of the raft so that when a raft is unshipped and strikes the water upon its edge, the edges of the plate will assist in receiving the shock and will thus greatly reinforce the raft body. These plates are preferably arranged between the superimposed layers of such wood and, as shown, between the top layers or caps and the intermediate layers on opposite sides of the axis of said cylindrical body. As illustrated, two of these plates disposed parallel to each other between the aforesaid lay-

ers are placed at each of the curved portions between the short ends and the long sides of the oval raft, and additional parallel plates are also preferably disposed in the long sides intermediate the said curved portions. When the layers of wood are fastened together these plates readily become embedded in the imposing soft surfaces of the layers between which they are arranged. In addition to so embedding these plates, however, I also preferably fasten or anchor them to the said cylindrical body by wooden dowels in such a manner as to prevent shearing by such plates of the dowels. By punching suitable dowel apertures through the plates so that the metal punched through will form an outwardly extending burr on the plate, I am enabled to drive or hammer through such apertures said dowels which may be formed of any suitable hard wood and the wall of the burred aperture will prevent a shearing of the dowel by the plate when the raft is subjected to shocks. Furthermore the hammering on the upper end of such dowel causes the top thereof to be flattened and form a head which seats in the punched up aperture above described. The connection between a dowel and plate so formed therefore provides an effective anchoring connection between such reinforcing metal plates and the balsa wood body, and such plates will greatly reinforce the raft and enable it to withstand much greater strain or stresses.

The raft is preferably finished by sewing the cylindrical body thereof into an outer covering of canvas or like material. This outer covering not only protects the soft, pithy cellular structure of the balsa wood body of the raft but also, in case of rupture or breaking of the cylinders of balsa wood, will assist in retaining the broken parts together.

Having described my invention, I claim:—

1. A raft composed of a series of layers of light pithy wood which has been treated to make the same waterproof, said layers being connected together by dowels suitably driven into said layers in wedging relationship to hold the same together and a series of reinforcing plates embedded in said light pithy wood between adjacent layers thereof.

2. A raft composed of a series of layers of light pithy wood which has been treated to make the same waterproof, said layers being connected together by wooden dowels

suitably driven in said layers in wedging relationship to hold the same together, and a series of reinforcing plates embedded in said light pithy woods between the adjacent layers thereof, and wooden dowels driven through holes in said reinforcing plates and into the light pithy wood to connect the plates to the said layers of light pithy wood.

3. A raft composed of a series of layers of light pithy wood which has been treated to make the same waterproof, said layers being connected together by dowels suitably driven in said layers in wedging relationship to hold the same together, and a series of reinforcing plates embedded in said light pithy wood between the adjacent layers thereof and having apertures formed by punching through the metal to form an outwardly extending burr, and wooden dowels driven through said apertures into the layers of said light pithy wood to anchor the plates in place.

4. A raft composed of a series of layers of light pithy wood which has been treated to make same waterproof, said layers being connected together by dowels suitably driven in said layers in wedging relationship to hold the same together, a series of reinforcing plates embedded in said light pithy wood between the adjacent layers thereof and having apertures formed by punching through the metal to form an outwardly extending burr and wooden dowels driven through said apertures into the the layers of said light pithy wood to anchor the plates in place, said dowels having a hammered head adapted when driven to fill the space between the walls of said burred aperture.

5. A raft composed of a series of layers of light pithy wood which has been treated to make the same waterproof, a series of metallic reinforcing plates embedded in said light pithy wood between adjacent layers thereof and having an anchoring connection with said light pithy wood by dowels of relatively hard wood, and means for fastening said layers together.

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

HARRY W. BROADY.

Witnesses:

WALTER J. KROLMAN,
HELEN V. WHIDDEN.