June 5, 1945. H. G. MORNER 2,377,803

RELEASABLE FASTENING FOR LIFE RAFTS

Filed Aug. 22, 1944 2 Sheets-Sheet 1

Fig. 1

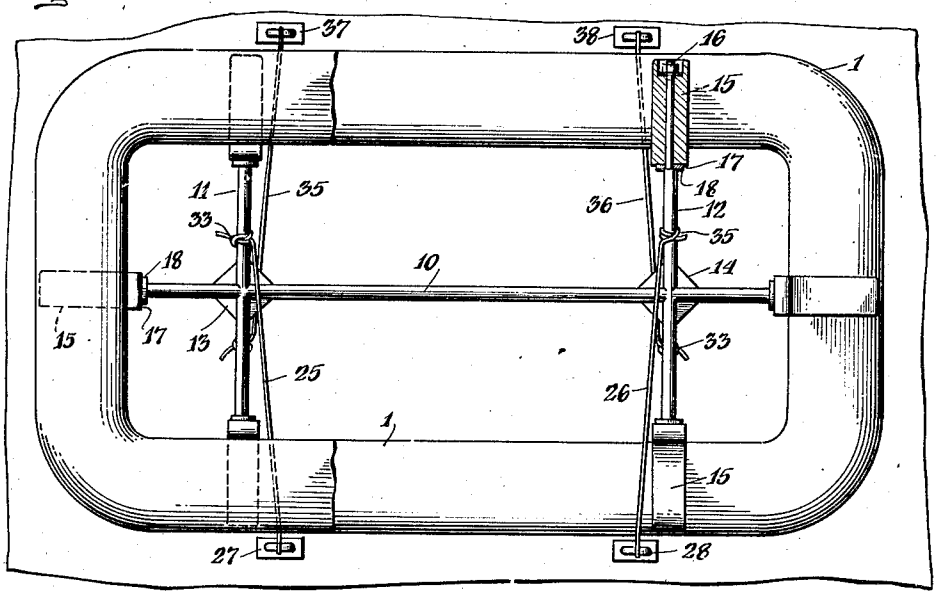
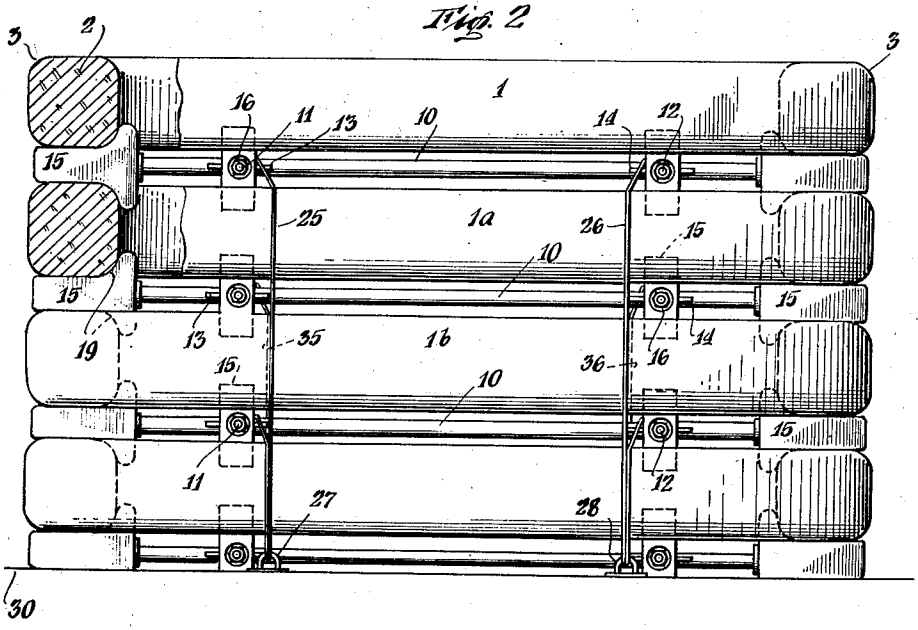


Fig. 2



INVENTOR.

Hans George Morner

BY

ATTORNEY

June 5, 1945. H. G. MORNER 2,377,803

RELEASABLE FASTENING FOR LIFE RAFTS

Filed Aug. 22, 1944 2 Sheets-Sheet 2

Fig. 3

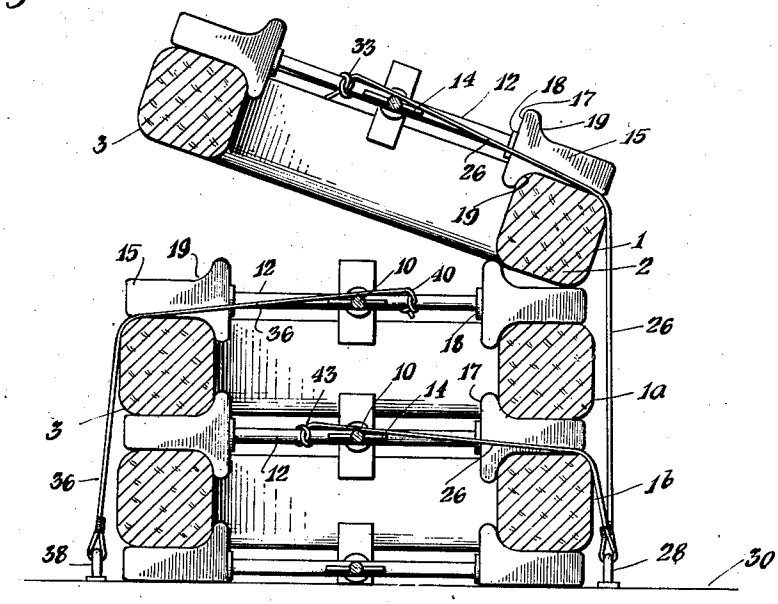
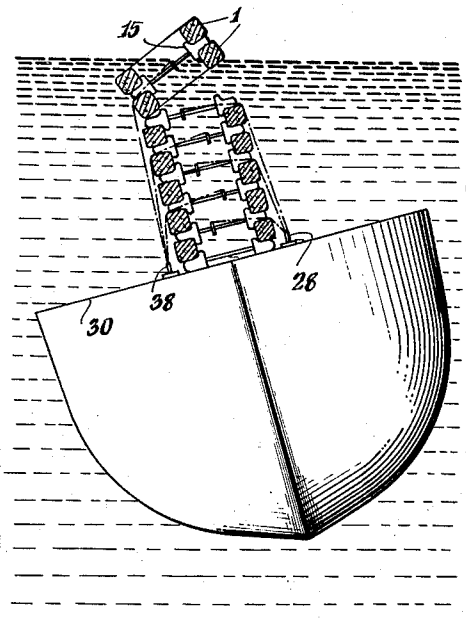


Fig. 5



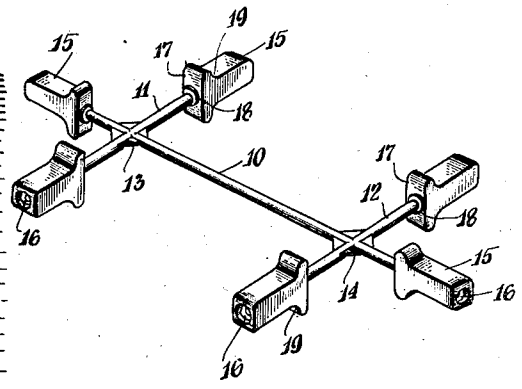


Fig. 4

INVENTOR.

Hans George Morner

BY

Howard M. Dunbar

ATTORNEY

Patented June 5, 1945 2,377,803

UNITED STATES PATENT OFFICE

2,377,803

RELEASABLE FASTENING FOR LIFE RAFTS

Hans G. Morner, New York, N. Y.

Application August 22, 1944, Serial No. 550,503

10 Claims. (Cl. 9—33)

The invention relates to improvements in devices for releasably securing life rafts or other buoyant objects carried on board vessels.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a top plan view of a stack of life rafts secured and equipped with means embodying the invention;

Fig. 2 is a side elevation of the stack shown in Fig. 1, a portion thereof being broken away to show the ends of two rafts in section;

Fig. 3 is a transverse central vertical section of a portion of said stack of rafts illustrating the raft-releasing operation thereof;

Fig. 4 is a perspective view of one of the raft-securing frames or brackets; and

Fig. 5 is a reduced, partly diagrammatic view of the invention in operation, showing the action thereof with a stack of rafts secured to the deck of a submerged vessel.

The invention is directed to providing novel means for releasably securing a nested or superposed stack of life rafts or similar buoyant objects to the surface of a ship or other vessel in such manner as to provide automatically for the immediate release and freeing of each of said stacked rafts from the stack as soon as the vessel sinks or otherwise submerges. The invention provides for securely fastening each of the rafts of the stack to the vessel and to the other rafts in the stack during normal sailing operations so that the rafts may be stacked with a view to the greatest economy of space on the deck and held thereon in secure position during normal movements of the vessel even under most severe weather or other sailing conditions.

While it is a relatively simple matter to so fasten a stack of rafts for normal sailing conditions, problems arise when the vessel submerges, at which time it is desired immediately to release the rafts individually so that they will float free from the vessel and be available for use by its survivors. As soon as the raft-supporting deck of a sinking vessel is submerged, the water tends to float the stack of rafts thereon and thus to exert an upward stress upon any lashings or other apparatus provided for fastening the rafts together and/or to the deck. This fact has caused great difficulty in readily unfastening stacks of floating or submerged rafts. Even if the lashings have been secured the whole stack will float off, the lowest rafts floating the rest, which makes it almost impossible for a survivor swimming in the water to pry them apart or otherwise separate the rafts in such a floating stack.

It has heretofore been the general and common practice to lash a stack of lifesaving rafts to the deck by means of pelican hooks and turnbuckles. This securely holds the stack to the deck but requires several manual operations to release each one of the stacks. In another method of fastening, the life rafts are stacked between uprights welded to the deck at the corners of the stack or around the edges of the life rafts. When the ship sinks on an even keel, the life rafts float out of the uprights but if the ship goes down with a considerable list, the stack may jam and go down with the ship. In either manner of lashing, the stack normally floats off as a whole, and the rafts can be separated and launched only by tilting the floating stack. This requires that one or more seamen climb the side of the floating stack of rafts, and tilt the stack until the rafts separate and float away. Due to the relatively heavy weight of each of the rafts, this is a very dangerous operation, and as the stack turns over in the water, the seamen may be seriously injured and possibly killed.

By virtue of the invention, a stack of rafts may be secured together as previously stated yet immediately upon submersion will automatically separate from each other and each unit of the stack in turn will float free therefrom and be delivered to the surface of the water unconnected with any lashing apparatus or other impedimenta. Furthermore, the rafts of the stack are released therefrom and from each other alternately from two sides of the stack so that they will tend to float apart from each other and thus not interfere with each other as they separate and come to the surface. However, all of the lashing apparatus used to secure the rafts together in the stack during normal operations will remain connected to the deck of the vessel and automatically be brought to rest thereupon in an

orderly manner during the releasing operation so that such lashing devices will not encumber the surface of the water or otherwise interfere with the rescue operations or safety of the survivors.

Another object of the present invention is to provide an anchoring means whereby the stack as a whole is firmly anchored to the ship's deck, while the individual rafts of the stack, from the top downward, are free from direct connection with the deck and, while normally held from displacement, are adapted to float off one by one and to be automatically released and separated from each other for rapid launching in the event of quick sinking of the ship.

Broadly described, the apparatus provides for the stacking of a plurality of rafts in nested relationship one above the other, separated by intervening frames or spacers of buoyant or non-buoyant specific gravity. Each of said separating frames is individually lashed to the deck of the vessel by one or more wires or like ties which run from within the separating frame over the raft below it, down one side of the stack and thereafter along to the deck. The lashing wires of one frame lead over the side of the stack opposite to those of the adjacent raft frames of the rafts above and below it, the rafts themselves not being positively connected to the deck at any time. As a result of this alternate unilateral frame lashing arrangement, the buoyant effect of the water on the submerged stack is such as to cause the uppermost raft to rise, and thereafter the next raft may rise at its free side and tilt toward its lashed side until the tilting reaches such an angle that the superposed frame is disengaged and falls with the lashing wires to the surface of the deck, thus freeing the second raft to float to the surface. This simple tilting operation automatically releases the raft and frame just below, permitting it to tilt to the opposite side under the buoyant action of the water and the pull of its respective lashing wires. Thus the rafts of a submerged stack will alternately tilt to the right and left of the stack, freeing themselves and releasing each other to float upwardly and to one side or the other while their lashing frames alternately are dumped on the deck over toward the sides of the stack toward which they are tilted. If time permits, the rafts may be launched manually before submergence, without requiring any severing of lashes or use of any force except the tilting of successive rafts in opposite directions.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory but are not restrictive of the invention.

Referring now in detail to the present preferred embodiment of the invention, illustrated by way of example in the accompanying drawings, the rafts shown in said drawings comprise the presently used substantially oblong bodies 1, filled with any suitable buoyant material 2. Said general shape and construction of life rafts is well known and constitutes no necessary part of the invention and the structure thereof is shown herein in general outline only. The interior portion of said raft bounded by the floating oblong body 1 may be empty or may contain a flat connecting web (not shown) which is usually perforated. The cross section of the oblong body 1 is preferably substantially square (Fig. 2) but usually the edges thereof are rounded as at 3 for safety and comfort in use.

In practice a plurality of such rafts are stacked in superposed relation as shown in Figs. 2, 3 and 5, usually at least five of said rafts constituting such a stack. In accordance with the invention and as previously stated, each of the rafts of the stack is separated from that below it by an intervening fastening frame as shown most clearly in Fig. 4. The central axis of said frame preferably is made of a metal pipe or rod 10 slightly less in length than the major outer axis of the oblong raft 1. Cross bars 11 and 12, similar in shape and material to the central bar 10 and long enough to extend across the raft are disposed crosswise of bar 10 about one-third of the distance between the center and the ends of said central bar. The bars 10, 11 and 12 preferably all lie in the same plane and the junctions of the bars 11 and 12 with the bar 10 are preferably strengthened by diamond-shaped webs 13 and 14 respectively as shown in Figs. 1 and 4.

The ends of the bars 10, 11 and 12 are designed to rest snugly upon the top surface of the raft below them and similarly to support the raft above them. For this purpose each end of each of said bars is provided with a raft-engaging block 15 preferably, though not necessarily, formed of wood. Each of said blocks is identical in construction and a description of one will suffice. The blocks 15 are centrally bored to fit about the ends of the round bars 10, 11 and 12, said bars projecting through the block bores and being threaded at their projecting ends. The blocks are thus tightly fastened at the ends of the bars by nuts 16, the inner ends 17 of the blocks bearing against collars 18 which are integral with or welded to the respective bars.

The blocks are substantially T-shaped, the inner ends 17 being the head of the T. Said heads 17 are arcuately cut away at 19 on both the top and bottom sides to conform to the curvature 3 of the raft so that said arcuate surfaces 19 and 3 nest together as shown for example in Figs. 2 and 3. The elongated or stem portion 15 of the block is straight and flat so as correspondingly to conform to the square faces of the raft bodies 1. As shown in Figs. 2 and 3 between each two rafts of the stack there is placed one of the cruciform frames just described which frame is closely nested with respect to the rafts above and below it and serves frictionally to hold said rafts in place with respect to each other and thereby to form the stack. The shape of said frames is such that the raft cannot slide laterally in any direction, while the weight of the rafts and frames holds the stack together.

In accordance with the invention, however, additional means are provided for lashing the stack of rafts to a fixed locus on the deck, which means also serves to effect the prompt and separate release of the rafts from the stack and from each other upon submersion. For this plural purpose, flexible lashing wires, ropes, cables or other similar tension means are provided. The lashing wires 25, as shown, constitute the present preferred form of such means. As embodied a pair of spaced wires 25 and 26 are provided for lashing a separate frame to the ship's deck. Said wires are looped through and fastened to suitable eyes or staples 27 and 28 respectively, which staples are bolted, riveted or otherwise fastened to the deck surface 30. The wire 26, for example, is run vertically upwardly along the outerside of the stack and over the top of the raft body 1 which lies below the uppermost separating frame, across the top of said body and over the cross-bar 12 and the central bar 10 of

the frame to engage the bar 12 on the far side of the diamond-shape web 14. This engagement is made by looping the end of the wire at 33 around said bar 12 at least once and then fastening the free end to the running part of the wire by clamps or other suitable fastening means. The wire 25 is run upwardly from the staple 27 and fastened to the cross bar 11 of the frame in similar manner. By this fastening arrangement the frame and the raft 1 beneath it are firmly lashed to the deck, the wires 25 and 26 being made as taut as possible, and this lashing tends to constrict the whole stack while resting on the deck. Referring to Fig. 3, it will be seen that the next lower frame which separates the raft 1 from the raft 1a below it is similarly fastened to the deck by wires 35 and 36 which engage similar staples 37 and 38. It will be noted that the wire 36 is looped about the cross bar 12 of said frame at a point 40 beyond the center rod 10 of said frame and at the side opposite the fastening of the upper wire 26 at the point 33 on the frame above.

The intervening frame for the next lower raft 1b is attached to the deck by wires arranged through the staples 27 and 28 in the manner first described with respect to the frame for raft 1 (Fig. 3). That is, the wire 26 for the frame above said raft 1b rises from staple 28 and is connected at point 43 to the cross bar 12 of the lowermost frame, which point 43 is directly below the point 33 of the uppermost frame of the stack of three rafts shown in Fig. 3, when said rafts are all nested in the stack in their static condition.

Referring now to the operation of the invention when the deck 30 of a vessel is submerged, same will be clear from Figs. 3 and 5. Bearing in mind that each raft of the stack shown in Fig. 5, for example, is lashed to the deck by wires running from the frame above it to staples on one side only of the stack, while the frame above the raft just below (and of alternate frames like it) are lashed by wires running to staples at the opposite side of the stack, the principle of the operation will be clear.

With the arrangement shown and described the stack will be firmly held in position against shifting of the rafts or displacement of the stack as a whole under any and all normal disturbing forces, while the rafts are free to be removed one by one without the necessity of first severing any lashes. Thus the rafts are adapted to be successively removed and launched, when their use becomes necessary, within a minimum period of time, without liability of confusion, and with a minimum amount of labor. If sufficient time for their manual removal is afforded, the top raft, which is free to be lifted off, may be removed and launched, after which, by simply lifting the spacers and swinging them outwardly, successively in opposite directions, the underlying rafts may be conveniently removed one by one and launched. In the event, however, of the rapid sinking of the ship, as soon as the vessel submerges sufficiently to bring the top raft of the stack below water, the buoyant effect of the water on said rafts will cause the uppermost one to rise from its free side and tilt about the blocks 15 on the frame just below it. The wires 25 and 26 (Fig. 3) on the frame above said raft 1 will hold taut while the free or unlashed side of the frame rises under the floating raft. This tilting action continues until the raft assumes an angle sufficiently steep above horizontal to throw off the frame resting on top of it. The attachment of the wires at the point 33 beyond the center line of the frame tends to impart a strong disengaging leverage to this motion so that the frame is quickly pulled away from the tilting raft and falls free to the side of the stack. During the tilting action the lower edge of the raft turns upon the stem 15 of the frame below it, thereby tending to hold said frame in place. Also this action tends to hold down that side of the raft below. However, as soon as the frame above is cast off, the raft 1 floats away and then the free edge of the next frame below is able to rise as the raft 1a starts to tilt about its opposite side under the influence of the wires 35 and 36 attached as shown. Thus in a stack such as shown in Fig. 5, the rafts will be tilted successively to one side and then to the other and their frames disengage toward said respective sides in alternate relation from the top to the bottom of the stack. Preferably the uppermost raft (Fig. 2) is allowed to rest freely on top of the first frame without any lashing above said raft. Thus when the vessel is submerged the first raft floats freely upwardly from the top of the stack and so is automatically disengaged as shown in Fig. 5.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. A device of the class described including in combination, a plurality of life rafts stacked in superposed relation on the deck of a vessel, non-buoyant spacing frames between each raft and the one below it in the stack and tension members running over an edge of each raft, said members being connected to the frame thereabove and to the deck adjacent said edge of the raft, the tension members from alternate frames being connected to the deck at opposite sides of the stack whereby the unbound sides of the rafts in the stack may rise under the buoyant effect of water to tilt the rafts and superposed frames in opposite directions to free said rafts and frames from the stack.

2. A device of the class described including in combination, a plurality of oblong life rafts stacked in superposed relation on the deck of a vessel, non-buoyant spacing frames between each raft and the one below it in the stack and tension members running over a longitudinal edge of each raft, said members being connected to the frame thereabove and to the deck adjacent said edge of the raft, the tension members from alternate frames being connected to the deck at opposite sides of the stack whereby the unbound sides of the rafts in the stack may rise under the buoyant effect of water to tilt the rafts and superposed frames in opposite directions to free said rafts and frames from the stack.

3. A device of the class described including in combination, a plurality of oblong, open-center life rafts stacked in superposed relation on the deck of a vessel, non-buoyant spacing frames between each raft and the one below it in the stack occupying a portion of the open-center space of said rafts, and tension members running over an edge of each raft, said members being connected to the frame thereabove and to the deck adjacent said edge of the raft, the tension mem-

bers from alternate frames being connected to the deck at opposite sides of the stack whereby the unbound sides of the rafts in the stack may rise under the buoyant effect of water to tilt the rafts and superposed frames in opposite directions to free said rafts and frames from the stack.

4. A device of the class described including in combination, a plurality of oblong life rafts stacked in superposed relation on the deck of a vessel, non-buoyant spacing frames between each raft and the one below it in the stack and tension members running over a longitudinal edge of each raft, said members being connected to the frame thereabove and to the deck adjacent said edge of the raft, the tension members from alternate frames being connected to the deck at opposite sides of the stack whereby the unbound sides of the rafts in the stack may rise under the buoyant effect of water to tilt the rafts and superposed frames in opposite directions to free said rafts and frames from the stack, the tension members being connected to the respective frames at points beyond the center lines thereof remote from the sides of the stack on which said members are fixed to the deck.

5. In means for securing a vertically disposed stack of life rafts and raft spacers to a ship's deck, and in combination with a series of superposed rafts, and spacers between the rafts, lashes connecting different spacers at the respective sides to the deck at opposite sides of the stack and extending from said spacers outside of the respective raft sides.

6. In means for securing a vertically disposed stack of life rafts and raft spacers to a ship's deck, and in combination with a series of superposed rafts, and spacers between the rafts, lashes arranged at opposite sides of the stack alternately connecting spacers at the opposite sides of the stack to the deck and extending from said spacers outside of the respective raft sides.

7. In means for securing a vertically disposed stack of life rafts and raft spacers to a ship's deck, and in combination with a series of superposed rafts, and spacers between the rafts, a set of lashes at one outer side of the stack connecting spacers at different levels to the deck, and a set of lashes at the opposite outer side of the stack connecting spacers at other different levels to the deck.

8. In means for releasably anchoring a stack of superposed life rafts and intervening raft spacers to a ship's deck, a lashing at one outer side of the stack connecting the top spacer of the stack to the deck, a lashing at the same side of the stack connecting an intermediate spacer of the stack to the deck, and lashings at the opposite outer side of the stack respectively connecting the others of the spacers arranged between rafts of the stack to the deck.

9. In means for releasably anchoring a stack of superposed life rafts and spacers disposed between the rafts to a ship's deck, lashes connecting different spacers of the stack from top to bottom of the stack to the deck alternately at opposite sides of the stack, each of the lashes extending on one outer side only of the stack from the deck to a spacer.

10. In combination with the deck of a ship, a stack of life rafts mounted thereon, and spacers disposed between the rafts and releasably engaged therewith, fasteners at one outer side only of the stack connecting certain spacers with the deck, and fasteners at the opposite outer side only of the stack connecting the remaining spacers with the deck.

HANS G. MORNER.