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HYDRAULICALLY RELEASABLE MECHANISM FOR LIFE RAFTS AND THE LIKE

Filed Aug. 22, 1942

Fig.1.

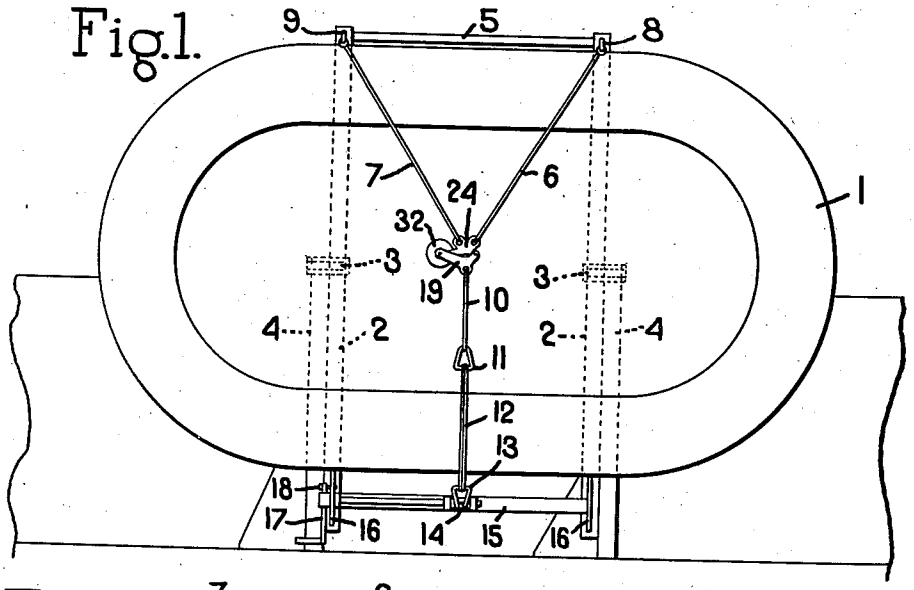


Fig.2.

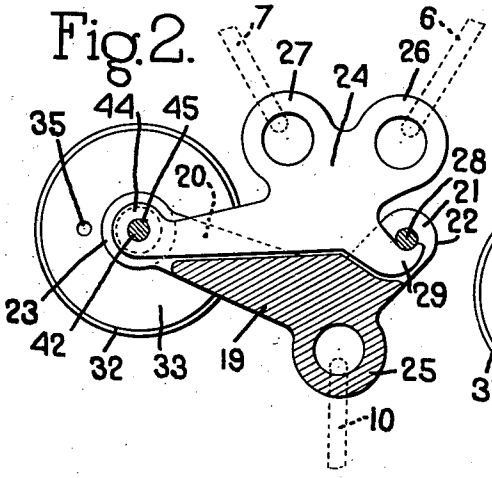


Fig.3.

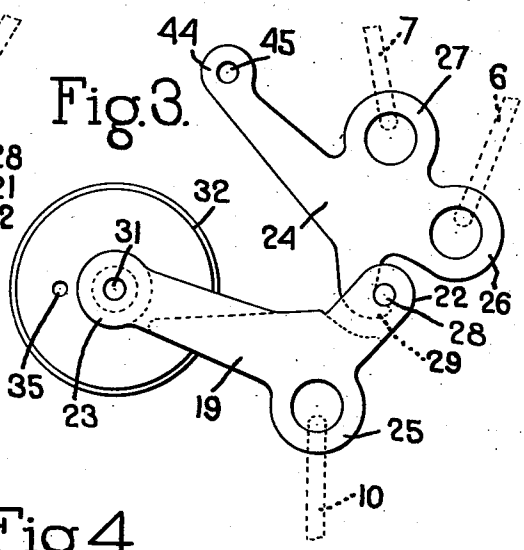
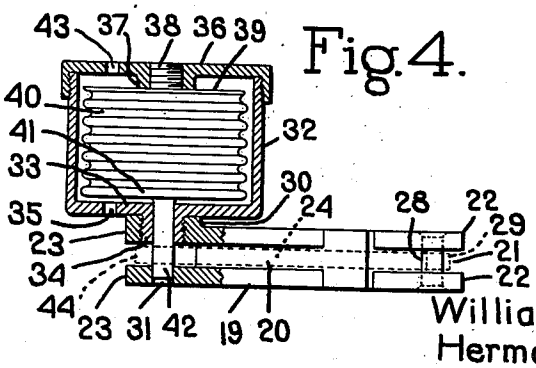


Fig.4.



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HYDRAULICALLY RELEASABLE MECHANISM FOR LIFE RAFTS AND THE LIKE

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7 Claims. (Cl. 9—23)

This invention relates to hydraulically operable means for releasing the members which lash down buoyant life-saving devices such as rafts or the like to a ship, and the object of the invention is to provide mechanism which, upon submergence of the ship with a life-saving device secured to it, will free the life-saving device promptly so that it will float to the surface and thereby be available to persons who may be swimming in the water.

Life-saving rafts and the like have usually been lashed down to a launching davit or against a bulkhead, and manually operable means provided for releasing the lashings to enable the life-saving device to be launched into the water.

As a result of the current war, it has been clearly shown that the present method of releasing life rafts on merchant and naval vessels is inadequate. Ships that are torpedoed often sink in three to five minutes, and authentic reports of many of these sinking reveal that life rafts often sink with the ship due to the fact that no one had time to trip the release. Many lives have been lost that could have been saved had the raft-releasing mechanism been designed to operate automatically upon the sinking of the vessels.

The object of the present invention is to provide means for locking a life-saving raft or the like to the ship, which will be automatically released by hydraulic pressure upon submergence of the raft.

More specifically, the object of the invention is to provide automatically releasable locking means which may be readily embodied in usual lashing-down devices and which upon submergence of the vessel and the life raft will be hydraulically operated to permit separation of the lashing devices so that the raft will be permitted to float to the surface of the water.

The preferred embodiment of the invention illustrated in the accompanying drawing as applied to usual mechanism for lashing down a life raft upon a suitable launching device, in which,

Fig. 1 is an elevation of a usual form of life raft lashed to a launching davit;

Fig. 2 is a detail enlarged plan view, partly in section showing a preferred form of hydraulically releasable locking mechanism for the lashings which hold down the life raft upon the launching device, and illustrating the parts in locked position;

Fig. 3 is a plan view of the same showing the relative positions of the complementary members of the locking device when in substantially released position;

Fig. 4 is a view mainly in vertical section showing the parts in assembled position with the locking pin held in locking positions by a Sylphon bellows adapted to be collapsed upon submergence of the device.

As illustrated in Fig. 1, the life raft 1 is secured to a launching frame having side bars 2 which are mounted upon pivotal connections 3 to standards 4 of a launching davit and are connected together at their upper end by a suitable cross bar 5.

In usual constructions, the lashings comprise cables 6 and 7 which are connected to eye bolts 8 and 9, respectively mounted in the upper ends of the side bars 2, and converge therefrom as illustrated, and are connected to a metal ring. Another cable 10 which is likewise connected to the ring is provided at its end with a stirrup 11, which in turn is connected to a cable or cables 12, which in turn is connected to a stirrup 13, usually of triangular form, which engages a hook 14 upon a rotatable bar 15, which is pivotally mounted at its ends in suitable bearing plates 16 upon or adjacent to the lower ends of the side bars 2. A crank 17, which is secured to one end of the bar 15, provides means by which the bar can be rotated in a direction to cause the hook 14 to impose a desired tension upon the lashings which will bind the life raft 1 firmly against the side bars 2. Suitable means such as a removable pin 18 slidably mounted in an extension of the crank 17 engages a hole or one of a series of holes in the bearing plate 16 when the crank has been rotated sufficiently to impose the proper tension upon the lashings.

When the life raft is to be launched, the frame which supports the raft is rotated upon the pivots 3 to an outboard position. The pin 18 is then withdrawn thus permitting the bar 15 to be rotated by the crank 17 in a reverse direction so that the stirrup 13 will become disengaged from the hook 14, the raft and the lashings thereby freed so that the life raft will slide from the frame into the water. Of course, an appreciable time is required to launch the life raft in this manner, and if the vessel sinks quickly as frequently occurs when the vessel is torpedoed in war time, it may be impossible to launch the life raft or if by reason of shifting of movable objects upon the deck the launching mechanism becomes jammed, launching of the raft will be prevented.

The preferred embodiment of the invention which is illustrated in the accompanying drawing comprises a simple device adapted to be substituted for the usual ring which connects

the members 6, 7, and 10 of the lashing cables together, and which is adapted to be hydraulically operated to release the lashings upon submergence of the life raft.

This mechanism is in the form of a coupling preferably comprising two substantially flat separable coupling members or sections which are releasably secured together, and having hydraulically operable means for unlocking the members upon submergence of the couplings preferably to a predetermined depth. The main coupling member 19 is of generally triangular form, and is provided with channels 20 and 21 to provide bifurcated end portions, 22 and 23, to receive therebetween in interfitting relation the end portions of the thinner coupling member 24. The main coupling member 19 is provided with an apertured boss 25 to which the end of the lashing cable 10 is connected. The complementary coupling member is provided with apertured bosses 26 and 27 to which the ends of the lashing cables 6 and 7 are respectively connected, the connections 6—7 and 10 being so positioned as to establish the general line of pull of the lashing-down members through the complementary coupling sections. A stud 28 is mounted in a bifurcated end 22 of the main coupling member, and provides an anchorage for a hook-shaped portion 29 of the complementary coupling member 24.

The upper wall of the opposite end of the main coupling member is provided with a thick-end portion or boss 30, having an aperture therethrough provided with a screw-threaded wall, and the lower member of the bifurcated end portion is provided with an axial aligned hole 31 of smaller diameter to receive a locking bolt.

The locking mechanism comprises a cylinder 32 having a base 33 provided with a downwardly extending screw-threaded boss 34 which is seated in the aperture of the upper member of the bifurcated end portion 23 of the main coupling member. Base 33 of the cylinder is provided with one or more ports 35 to permit entrance of water into the cylinder. A cap 36, which is provided with a downwardly extending flange, is screwed upon the upper end of the cylinder 32 and is provided with a central downwardly extending boss 37 on which is mounted a stud 38, the lower end of which is connected to the flat upper wall 39 of a Sylphon bellows 40. The lower wall 41 of the Sylphon bellows 40 has secured to it a locking bolt 42, which is slidably mounted in the boss 34 in registry with a hole 31 in the lower member of the bifurcated end 23 of the main coupling member. The cap 36, desirably also is provided with one or more ports 43 to admit water into the chamber of the cylinder 32.

The complementary coupling member 24 is provided with a substantially cylindrical end portion 44 having an aperture 45 substantially to fit the locking bolt 42, when the members are in assembled position as illustrated in Fig. 2.

In assembling the device in locking position, the cap 36 and the attached Sylphon bellows and bolt 42 are removed. The hook-shaped end 29 of the complementary coupling member is inserted in the channel 21 and hooked upon the stud 28. The opposite end portion of the complementary coupling member is inserted in the channel 20 and the aperture 45 therein brought into alignment with the central apertures in the boss 34 and the hole 31 in the bifurcated end 23 of the main coupling member. The locking bolt 42 is then inserted through the boss 34, the aperture 45 of the complementary section 24, and the hole 31 in the lower member of the bifurcated end portion 23 of the main and supplemental coupling members thereby normally locking the sections 19 and 24 together.

The Sylphon bellows may contain air at atmospheric pressure or under a predetermined pressure greater than atmospheric pressure or a volatile fluid the vapor of which will produce sufficient fluid pressure within the bellows to retain the bolt 42 in locked position until the coupling mechanism is submerged to a sufficient depth to enable the hydrostatic pressure of the water which enters the cylinder through the ports 35 and 43 sufficiently to overcome the internal fluid pressure within the Sylphon bellows and thereby collapse the bellows enough to withdraw the locking bolt 42 from engagement with the end portion of the complementary coupling member 24, whereupon the complementary coupling member will first swing to the position illustrated in Fig. 3 and thereafter release engagement of the hooked-end portion 29 thereof with the stud 28, thus completely separating the main and complementary members of the coupling and freeing the lashings so that the raft can float to the surface.

It will be readily understood that the particular hydraulically releasable locking mechanism which is shown and described herein is of an illustrative character, and that other forms of hydraulically operable releasable mechanism such as a cylinder having a piston or diaphragm connected to a locking bolt or latch, and resilient means for normally holding the parts in locked position may be employed with means for admitting water when the device is submerged into the cylinder to release the locking bolt or latch from engagement with the complementary member may be employed, and that various modifications may be made in construction and arrangement of parts within the scope and meaning of the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A coupling for releasably securing together two flexible lashing-down members of a buoyant life-saving device comprising a coupling having separable interfitting complementary sections one of which is recessed to receive a portion of the other and having respectively means of attachment to the respective lashing-down members to establish the general line of pull of said lashing-down members through said sections, means for releasably and separably securing said sections together comprising pivotally separable interengaging means located on one side of the general line of pull and a locking bolt located on the opposite side of said general line of pull, and hydraulically operable means for withdrawing said locking bolt upon submergence thereby to permit pivotal movement of said sections and free separation thereof.

2. A coupling for releasably securing together lashing-down members of a buoyant life-saving device comprising separable interfitting complementary sections one of which is recessed to receive a portion of the other and having respectively means of attachment to the respective lashing-down members to establish the general line of pull of said lashing-down members through said sections, means for releasably and separably securing said sections together comprising a pivotally releasable hook and pin located on one

side of said line of pull and a locking bolt extending through said members located on the opposite side of said line of pull normally connecting said complementary sections, and means operable by hydraulic pressure upon submergence of said device to withdraw said locking bolt and thereby permit pivotal movement of said sections and free separation thereof.

3. Mechanism for releasably securing together lashing-down members for a life raft or the like comprising a coupling having complementary interfitting separable sections connected respectively to adjacent portions of the lashing members to cause the general line of pull of the lashing members to pass through said sections, said sections being provided respectively on opposite sides of said line of pull with pivotally separable inter-engaging means and cooperating locking means having a bolt normally extending through aligned holes in said complementary sections, and hydraulically operated means connected to said bolt operable upon submergence of said raft and coupling to withdraw said bolt sufficiently to release its engagement with one of said sections and thereby permit relative pivotal movement of said sections and consequent separation thereof.

4. Mechanism for releasably securing together lash-down members for a life raft or the like comprising a separable coupling having a main section, and a complementary section adapted to be connected respectively to adjacent portions of the lashing members to cause the general line of pull of the lashing members to pass through said sections, and having at one end an inter-engaging hook and pin connection releasable upon relative pivotal movement of said sections, and at a distance therefrom gaseous fluid actuated means normally locking said sections together and operable by hydraulic pressure of sufficient force to overcome the pressure of said gaseous fluid upon submergence of said raft and coupling to unlock said locking means, and thereby release said lashing members.

5. Mechanism for releasably securing together lashing-down members for a life raft or the like comprising a coupling having a main section provided with bifurcated end portions to receive therebetween portions of a complementary section, a stud extending through one bifurcated end portion, a ported cylinder mounted on the other end portion having therein a Sylphon bellows provided with a locking bolt normally extending through aligned holes in said end, and a complementary section having a hook normally engaging said stud, and a hole receiving said locking bolt.

6. Mechanism for releasably securing together lashing-down members for a life raft or the like comprising a coupling having a main section provided with bifurcated end portions to receive therebetween portions of a complementary section, a pin extending through one bifurcated end portion, a cylinder mounted on the other bifurcated end portion having a port in its bottom, and a cap detachably secured to the upper end of said cylinder, a Sylphon bellows mounted on said cap having at its opposite end a locking bolt normally extending through the bifurcation of said end, and a complementary section having a hook normally engaging said pin, and a hole receiving said locking bolt.

7. A separable coupling for releasably securing together lashing-down members for a buoyant life-saving means comprising complementary sections one of which is bifurcated and the other provided with a portion to enter the bifurcation, means for attaching the respective sections to the respective lashing-down members to cause a general line of pull of the lashing-down members to pass through said sections, means separably connecting said sections comprising a pivotally separable interengaging hook and pin on the respective sections at one side of the line of the pull and a locking bolt located on the opposite side of the line of pull extending through the bifurcation of one section and the portion of the other section therebetween, yieldable means normally retaining said bolt in locking position, and means permitting hydraulic pressure of the water upon submergence of said device to overcome the force of said yieldable means and withdraw said bolt from locking position, thereby to permit relative pivotal movement of said sections and consequent free separation thereof.

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