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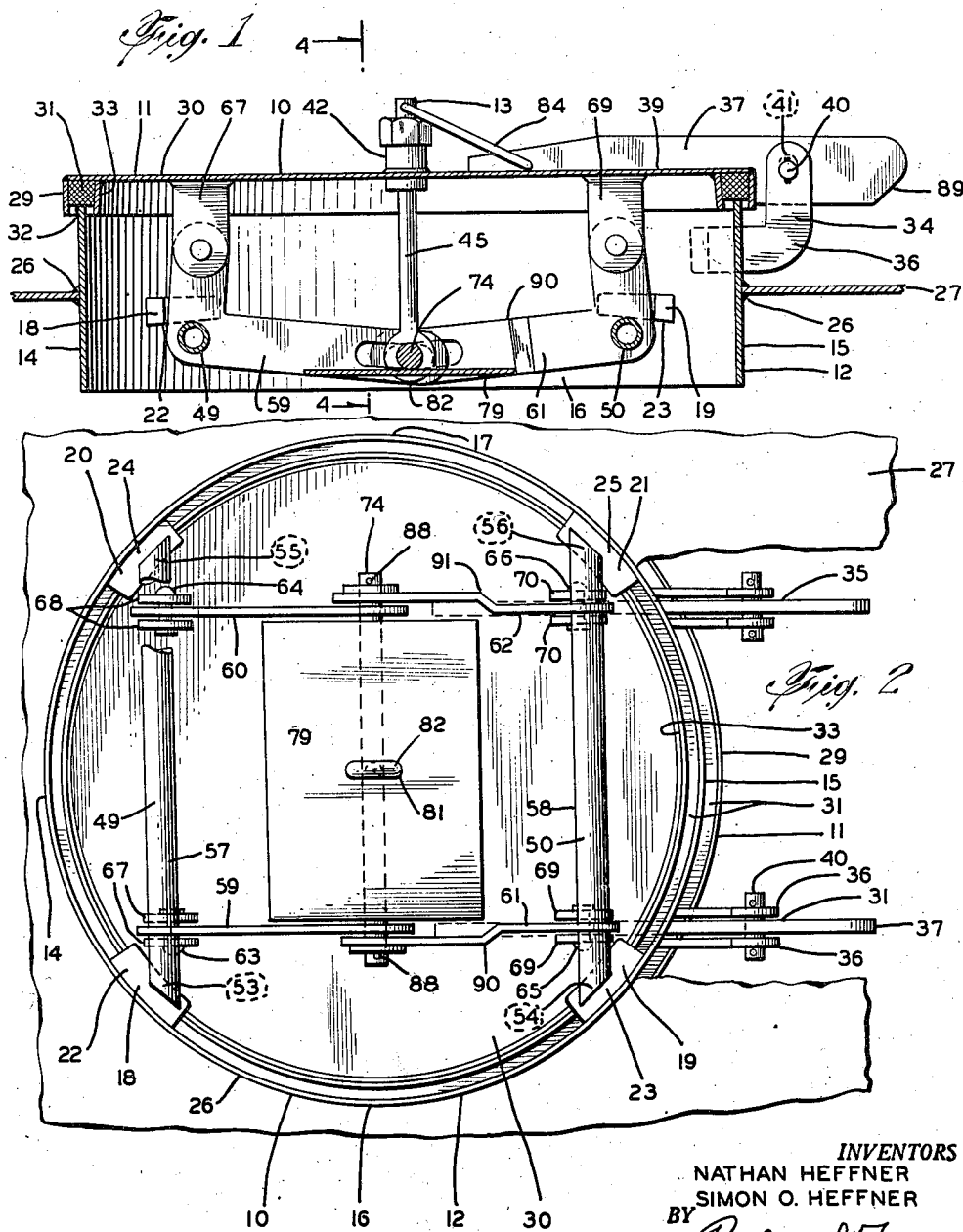
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2,402,935

LATCH FOR ESCAPE HATCHES

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2 Sheets-Sheet 1



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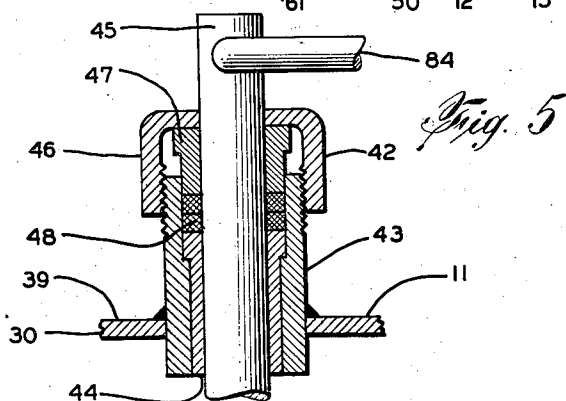
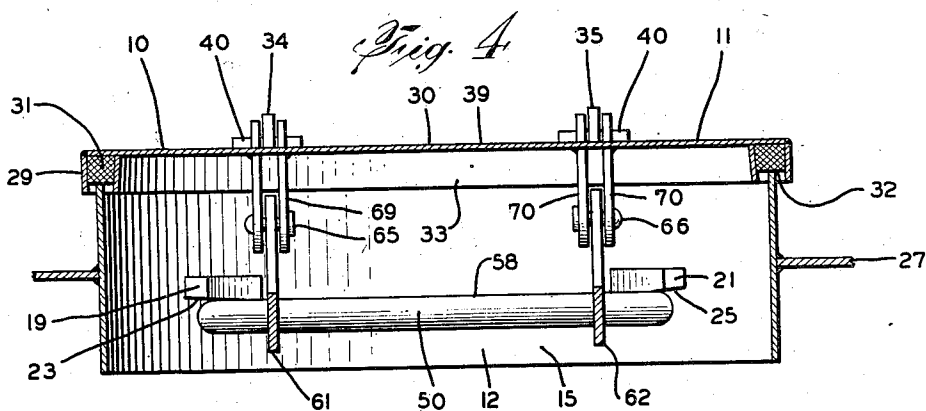
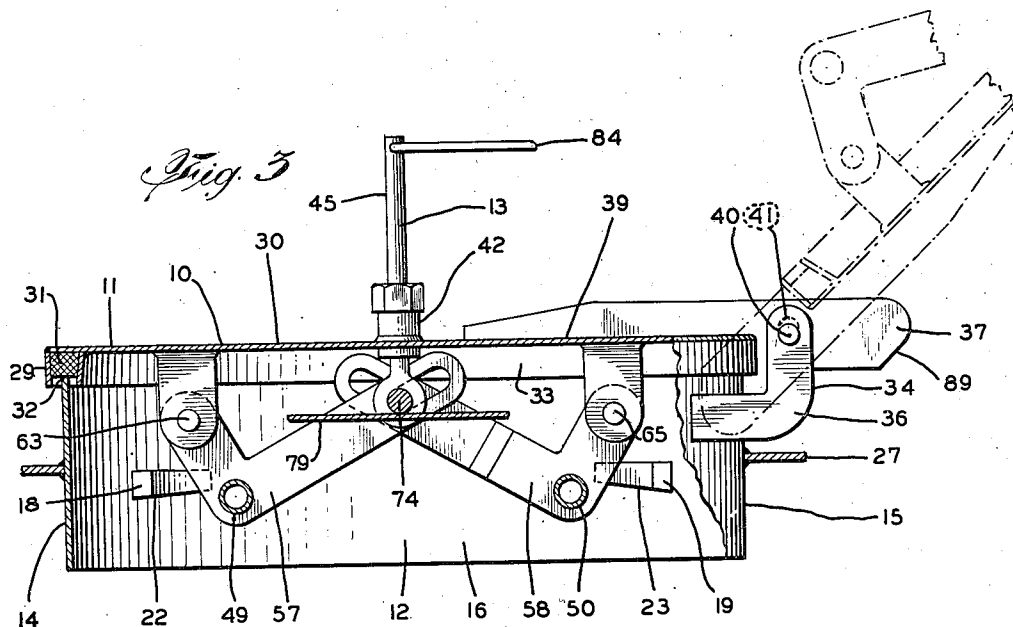
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LATCH FOR ESCAPE HATCHES

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This invention relates generally to hatches and more particularly to quick operating hatches especially useful for the escape of seamen from the quarters in which they may become accidentally entrapped.

As is well known in the nautical field, when, owing to accident or attack in war, a portion of the ship becomes flooded or afire, so that the normal exit from a room or through a bulkhead is obstructed, it is desirable that some additional exit or exits be provided, such exits being located in opposite walls or bulkheads, or communicating with different companionways or passages from those which are effected by the obstructing conditions. Where the deck or outermost side wall portions of the hull are adjacent or adjoining, it is desirable that these auxiliary exists communicate therewith or lead directly out thereon.

As a result of concussion, shock, water, or noxious gases, caused by combustion or otherwise, the occupants of the particular chamber, room, or hold, may be dazed, partially asphyxiated, or otherwise physically incapacitated, so that it is desirable that the escape hatches provided be easily operated and be of such a simple nature in the operation thereof that they may be successfully opened under the most adverse conditions.

It is therefore among the principal objects of the present invention to provide novel and highly useful escape hatch constructions which may be prefabricated as a unit and installed in any desired wall or bulkhead of a ship merely by cutting the requisite sized opening in the wall or bulkhead and securing the escape hatch in place.

Another object herein lies in the provision of a structure of the class described which, while of relatively light weight, possesses adequate strength so that the same may, when desired, be positioned upon the outer hull or deck of the ship upon which it is installed.

Another object herein lies in the provision of escape hatch structure in which the opening thereof may be substantially instantaneously performed, so as not to hinder the escape of the occupant or occupants under extremely hazardous conditions.

A feature of the present invention lies in the fact that the escape hatch may be operated by a simple pulling or pushing operation, as the case may be, and in which the operation thereof is made so obvious to the user that he may successfully accomplish his escape even though he may be in a below-normal physical condition.

In accordance with the present invention, structure is disclosed wherein, where the escape

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hatch has the outer portion thereof accessible to a companionway, passage, or other area likely to be occupied or reached by other persons than the one or ones trapped, the same may be actuated from the outside thereof.

A feature of the present invention permits the same to be used under circumstances where the wall, within which the escape hatch is positioned, needs be water-tight. In the use of the present invention, a water-tight connection between the cover plate of the escape hatch and the surrounding portions may be obtained in a quick and easy manner.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings in which similar reference characters designate corresponding parts throughout the several views of each embodiment:

Figure 1 is a fragmentary vertical sectional view of an escape hatch construction which is an embodiment of the invention. This figure shows a closed and latched position.

Figure 2 is a fragmentary bottom plan view of the device shown in Figure 1 as seen from below.

Figure 3 is a fragmentary vertical sectional view taken similarly to Figure 1, but showing the device in a closed and unlatched condition.

Figure 4 is a fragmentary vertical sectional view as seen from the plane 4—4 on Figure 1.

Figure 5 is an enlarged fragmentary sectional view partly in elevation showing the details of the stuffing box.

Turning now to the embodiment of the invention illustrated in Figures 1-5, inclusive, the escape hatch, generally indicated by numeral 10, comprises broadly a hatch cover element 11; a coaming element 12; and latching, compression, and opening mechanism, generally indicated by reference character 13.

The coaming element may be of any suitable general size, but the effective internal diameter thereof is preferably sufficient to allow the passage therethrough of a person aboard ship, or other structure upon which the hatch 10 is used.

We have found that the circular coaming element may have an effective internal diameter of between eighteen and twenty-five inches with satisfactory operation.

Since the device 10 may be used on a wall or bulkhead, or even on a large hatch or door the circular coaming may for clarity of this disclosure

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be described as having a top or free end wall portion 14, a bottom or hinge end wall portion 15, and side or lateral wall portions 16 and 17.

The coaming element is preferably composed of sheet steel. Secured to the inner surfaces of the opposed side walls 16 and 17 are the latching lugs 18—21, inclusive. These lugs may be in the form of steel blocks, and may be integrated with the inner surface of said coaming element in any suitable manner, as for example, by welding. The active surfaces 22, 23, 24 and 25 on the lugs 18, 19, 20 and 21, respectively, are preferably flat and are angularly disposed as best seen in Figures 1, 3 and 4. Thus the surfaces 22—25 form cam surfaces which taper away from the upper or exit edge 32 of the coaming element 12 in directions away from the bar 74.

The outer surfaces of the wall portions 14 to 17, inclusive, are connected to the edge 26 of an orifice in the deck, hatch, or bulkhead 27, in any suitable manner as for example by welding, and the position of this connection determines the ultimate amount of projection of the cover element 11 with relation to the deck or bulkhead 27.

It may thus be seen that in order to mount the coaming element 12 it is only necessary to cut an orifice of corresponding size in the deck or bulkhead upon which the coaming element is to be mounted and to secure the same in place by the engagement of the outer surfaces of the top, bottom and side walls of the coaming with the bordering edges of the said orifice.

The hatch cover element 11 is preferably composed of sheet steel and includes an outer inwardly or downwardly extending peripheral flange 29. The flange 29 may be integrated with the body 30 or may be formed by bending the edge of said body through ninety degrees. The cover element 11 is provided with an annular rim gasket 31 which may be composed of any suitable material adapted to promote a water-tight seal against the upper edge 32 of the coaming element 12 when said cover element 11 is compressed. We have found that the gasket 31 may be composed of impregnated flax or rubber. The gasket 31 is maintained in place by a gasket retainer 33. The retainer 33 may be in the form of an annular band positioned so as to be spaced and substantially parallel to the inner surfaces of the flange 29. The retainer 33 may be secured to the under surface of the body 30 in any suitable manner, as for example, by welding and is preferably slightly angularly disposed with relation to the flange 29 so as to converge downwardly toward the flange 29. This construction forms a channel having a narrowed mouth or annular opening within which the gasket 31 is maintained by compression. Thus, the rim gasket 31 as maintained in position between the flange 29 and the retainer 33 is under a primary compression and when the cover element 11 is in the closed, or coaming-engaged position thereof, said gasket 31 is subjected to a secondary compression, as will more fully appear hereinafter.

The hatch cover element 11 may be hingedly connected to the coaming element 12, for example by means of the hinges 34 and 35. Since the hinges 34 and 35 are substantially identical, a detailed description of one will suffice for both. As best seen in Figures 1 and 2 of the accompanying drawings, the hinge 34 includes a pair of relatively stationary members 36 and a relatively movable member 37. The members 36 are secured in any suitable manner to the outer sur-

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face of the coaming element 12, as for example, by welding. The member 37 is secured to the upper surface 39 of the body 30 in any suitable manner, as for example, by welding and is pivotally connected to the members 36 by means of a pin 40 and cotters assembly. The pin 40 penetrates the round orifices in the members 36 and elongated orifice 41 in the member 37. The elongated orifice 41 permits the hatch cover element 11 to shift in position slightly so that the lower surface of the gasket 31 may properly line-up with the upper edge 32 of the coaming element 12.

The body 30 of the hatch cover element 11 is provided with a stuffing box 42 which is preferably secured thereto by mounting the same in an orifice in said body and welding or brazing the outer cylinder 43 thereto. This construction is shown in detail in Figure 5. The cylinder 43 is provided in the forward portion thereof with a bushing 44 preferably composed of brass and having an external diameter substantially equal to the internal diameter of the cylinder 43, and having an internal diameter substantially equal to the diameter of the rod 45. The outer end of the cylinder 43 has a cap 46 in threaded engagement therewith. Disposed within the cap 46 and the cylinder 43 is a gland 47 preferably composed of brass. A flax or other suitable packing 48 is positioned about the rod 45, within the cylinder 43 and between the bushing 44 and the gland 47. The compression upon the packing 48 sufficient to maintain the rod 45 in slidable watertight connection with the stuffing box 42 is obtained by rotating the cap 46.

The latching, compression, and opening mechanism generally indicated by reference character 13, includes a pair of latching members 49 and 50 which are spaced and parallel. The latching members 49 and 50 at the outer extremities thereof are provided with end surfaces 53, 54, 55, and 56 which are adapted to engage with the latching lugs 18, 19, 20, and 21, respectively, in a closed position of the latching members.

We have found that adequate strength of the parts and a reduction in weight is obtained by forming the latching members of tubing, so that these members are hollow throughout the length thereof.

Each of the latching members is secured to a pair of levers to move as a unit, forming the latching elements 57 and 58. Thus the latching member 49 may be welded to the levers 59 and 60 and the latching member 50 may be welded to the levers 61 and 62. The levers 59—62, inclusive, are each of substantially L shape having their shorter arms generally vertically arranged as viewed in Figure 1 and their longer arms generally horizontally arranged in said figure. The latching members 49 and 50 are integrated with the levers which carry them preferably at the juncture of the long and short arms. The upper or outer ends of the short arms of the levers 59—62 are pivotally connected by pins 63—66, respectively, to the pairs of bearing supports or brackets 67—70, inclusive, respectively. The pairs of bearing supports 67—70, inclusive, depend from the lower surface of the body 30 and may be secured in place in any suitable manner, as for example by welding. Each of the extremities of the long arms of the levers 59—62 are provided with elongated slots within which the bar 74 is slidably disposed and said bar 74 may be limited against undesired displacement longitudinally of said bar by the pins 88.

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The bar 74 may have secured to the forward or lower surface thereof in any suitable manner, as for example by welding, the push plate 79 and to permit operation of the escape hatch 10 by even the uninitiated, the plate 79 may carry suitable indicia, such as the word "Push" and in order to permit the same to be legible even under adverse lighting conditions, said indicia may be in the form of luminous paint.

In the drawings, the device 10 is shown as mounted in a horizontal position and in order to open the hatch cover from below, it would be necessary to press upon the plate 79 in an upward direction and the movement of the plate 79 would by the interconnected structure unlatch the cover so that the same could be manually swung beyond a dead center position so that it might fall into the position indicated by the dot-dash lines on Figure 3. The cover 11, thus is limited in its most open position, to the position shown by the dot-dash lines on Figure 3 by the abutment of the surfaces 89 on the movable members 37 against the outer surface of the coaming element 12 particularly against the bottom or hinge end wall portion 15. Where it is desired to open the hatch 10 from above the cover 11, the ring or handle 84 may be manually grasped and pulled. This motion moves the actuating rod 45 and in turn elevates the bar 74 causing a movement of the latching members 49 and 50, identical with that produced when the plate 79 is pushed.

When the hatch 10 is mounted in a vertical position, it is desirable that the bottom or hinge end wall portion 15 be located at the lowermost position, so that after the latching members 49 and 50 are disengaged only a slight movement of the cover element 11 will be necessary to carry it beyond a dead center position so that the cover element will open itself substantially by the action of its own weight.

The lower or inner end of the rod 45 is provided with an eye 82 which surrounds the bar 74. The plate 79 is provided with a central orifice 81 adapted to receive the eye 82.

In order to close the hatch 10, it is necessary only to replace the cover element 11 with the edge 32 of the coaming element 12 in contact with the gasket 31 and to move the bar 74 either by means of the pusher plate 79 or by the rod 45 in a direction opposite to that previously described in connection with the opening of the hatch 10. This will bring the parts to the position shown in Figure 1. To place the gasket 31 under greater compression or to compensate for wear in said gasket, only further inward or downward movement of the bar 74 is necessary.

It may thus be seen that the movement of the bar 74 in the longitudinal direction of the rod 45 acts to move the latching members 49 and 50 to the closed and open positions thereof. The levers 61 and 62 are preferably offset at 90 and 91 so that the slots in the ends thereof do not bind upon the bar 74. Since the latching members 49 and 50 by the manipulation of the bar 74 have arcuate paths of travel about the pins 63-64 and 65-66, respectively, said latching members have in their movements both lateral and vertical components as viewed in Figures 1 and 3. This movement having both components mentioned, enables the latching members to be moved inwardly of the lugs 18-21 so that they properly clear said lugs when it is desired to open the hatch cover element. When the latching members are moved to the closed position

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thereof, not only do they move laterally outwardly of the device 10 so as to place themselves whereby their path of travel in an opening movement of the hatch cover element 11 will be obstructed by the lugs but they also move toward the lugs in a direction which causes the hatch cover element 11 to be pulled down against the edge 32 of the coaming element 12.

The present escape hatches may be used on horizontal surfaces such as decks, or on vertical surfaces such as bulkheads. The escape hatches may be repetitively operated for test and trial purposes since the re-seating of the hatch cover element to its original closed position requires merely the replacement of the cover element so that the gasket seats against the rear or outer rim or edge of the coaming element and the movement of the operating handle on one side of the cover plate or the other, as the case may be, to its original position or beyond to fully compress the gasket and obtain a leak proof seal thereat. By virtue of the compound leverage and wedge effect, the consequent mechanical advantage obtained provides for sufficient pressure even when only manual pressure or pull is exerted on the particular operating handle.

It may thus be seen that we have provided a novel and useful escape hatch construction which is simple and foolproof in operation and is capable of satisfactory performance over long periods of time and under adverse conditions. The combination construction may be fabricated as a unit and may be installed aboard ship by merely cutting the requisite sized opening to receive the coaming element and suitably securing the coaming element in connection with the border of said opening. Relatively little physical strength is required to open or close the hatch and to actuate the latching mechanism. This feature is especially advantageous since it may be necessary to actuate the closure and to open the same under extremely adverse conditions. Since the cover plate may be opened from either the front or rear or top or bottom surfaces thereof, it becomes possible to reach entrapped men, who are, by reason of injury, unable to reach or actuate the escape hatch, and to remove them through the hatch after the same has been opened.

We wish it to be understood that we do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. In an escape hatch construction: a coaming element; a hatch cover element; a stationary lug connected to said coaming element; a lever having two arms angularly disposed with relation to each other, said lever being pivotally mounted on said cover element; a latching element associated with said lever and movable therewith and movable into and out of engagement with said lug; one of said lever arms having an elongated slot; and an actuating rod disposed generally perpendicular to said cover element and reciprocally penetrating said cover element and articulately connected to said lever by engagement in said slot.

2. In an escape hatch construction: a coaming element; a hatch cover element; a stationary lug connected to said coaming element; a pair of substantially L shaped levers fixedly connected to each other and rotatably mounted, as a unit, on said cover element; said levers each having a slot; said levers each having a short arm and a long arm; said slot being elongated and located

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in the terminal of said long arm; an actuating rod slidably penetrating said cover element and articulately connected to said long arms in said slots; and a latching element on said levers and movable into and out of engagement with said lugs in correlation with the movement of the actuating rod.

3. In an escape hatch construction: a coaming element; a hatch cover element; a pair of stationary lugs secured to said coaming element; a shiftable latching member adapted in a closed position of the hatch to engage said lugs and in an open position thereof to disengage and clear said lugs; a lever pivotally mounted on said cover element and connected to said latch member; said lever having a short arm and a long arm with a slot in the end thereof; an actuating rod penetrating said cover element and articulately connected to said long arm by penetrating said slot.

4. In an escape hatch construction: a coaming element; a hatch cover element; a pair of stationary lugs secured to said coaming element, each of said lugs having a cam surface; a shiftable latching member adapted in a closed position thereof and of the hatch to engage said lugs, and in an open position thereof to disengage and clear said lugs; a lever pivotally mounted on said cover element and connected to said latch member; said lever having a short arm and a long arm with a slot in the end thereof; and an actuating rod penetrating said cover element and articulately connected in said slot to said long arm.

5. In an escape hatch construction: a coaming element; a hatch cover element; a stationary lug

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connected to said coaming element; an L-shaped lever having a first arm pivotally connected to said cover element and having a second arm with a free end, said second arm being arranged at an angle to said first arm; a latching element on said lever and located substantially at the junction of said first and second arms; said latching element being disposed closer to the free end of the second arm than the said point of pivotal connection is disposed with respect to said free end of the second arm; said lever being movable into a closed position in which the latching element engages the lug and into an open position in which the latching element disengages the lug.

6. In an escape hatch construction; a coaming element of generally circular configuration; a hatch cover shaped to fit the coaming element; a plurality of stationary lugs connected to said coaming element and equi-distantly arranged with respect to each other; a plurality of levers equal in number to said lugs and each having first and second arms angularly disposed with relation to each other; each lever having its first arm pivotally connected to said cover element and with its second arm having a relatively free end; a plurality of latching elements, one on each lever and movable therewith into and out of engagement with one of said lugs, each latching element being disposed on its respective lever so as to lie closer to the said free end of the second arm than the point of pivotal connection of the lever and the cover element is disposed with respect to said free end of the second arm.

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