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## LOCKING MECHANISM

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4 Claims. (Cl. 292—341.19)

This invention relates to the art of locking mechanism and more particularly to latches useful for marine application such as on hatch covers.

As conducive to an understanding of the invention, it is noted that where a hatch cover or panel on a hatchway is retained in position by a conventional locking mechanism of the type that includes a locking member pivotally mounted with respect to the deck of the ship, for example, and which pivotally mounts a ring adapted to engage a hook fixed with respect to the hatch cover, as the locking member and the hook must be spaced a predetermined distance apart for effective locking action and watertight security, precise tolerances are required in their positioning on the deck and the hatch cover. Furthermore, as the ring may stretch slightly with repeated use, even with such initial precise tolerances, water-tight security may not be maintained and the ring may have to be replaced with resultant cost and inconvenience.

It is accordingly among the objects of the invention to provide a latch of the type having a pivoted locking member which pivotally mounts a ring adapted to engage a hook to effect the locking action, and though of universal application is especially suitable for marine use to retain a hatch cover in secured position with respect to a hatch opening, which latch has but few relatively inexpensive parts which may readily be fabricated and installed at relatively low cost and without the need for precise tolerances in the positioning of the elements thereof and which may readily be adjusted to take up any stretching of the ring with long use and which may readily be locked or unlocked without the need for loosening of nuts and with but simple manipulations that may readily be performed with but a minimum of effort.

According to the invention, a fixed and a movable element mount complementary locking members including a hook and a pivotally mounted locking member carrying a resilient ring, preferably of spring steel, designed to be moved into and out of engagement with said hook. The hook is mounted so that it may readily be moved toward and away from the locking member for adjustment of the distance therebetween and means are provided to rotate said locking member between locked and unlocked position.

In the accompanying drawings in which are shown one or more of various possible embodiments of the several features of the invention,

Fig. 1 is a front elevational view of the latch,

Fig. 2 is a side elevational view thereof,

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1,

Fig. 4 is a rear view of the latch hook block on an enlarged scale,

Fig. 5 is a front view of the mounting pad,

Fig. 6 is a sectional view taken along line 6—6 of Fig. 7, and

Fig. 7 is a rear view of the mounting pad.

Referring now to the drawings, the adjustable locking device is shown as the retaining means for the cover 11

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of the hatchway of a ship. The side wall 12 of the cover has a resilient sealing strip 13 secured to the lower edge of side wall 12 so that when the hatch cover is in the closed position shown, the strip 13 will be compressed against a sealing rail 14 around the coaming 15 of the hatchway to provide a watertight seal.

The locking device comprises a U-shaped bracket 16, the cross piece 17 of which is affixed as by welding to the structure of the ship. A locking member 18 is pivotally mounted between the arms 19 of the bracket by means of a bolt 21 which extends through aligned openings in the arms 19 and the locking member 18, the latter desirably having an outwardly extending portion 22 with a recess 23 into which the end of a crowbar or the like may be positioned to pivot the locking member.

The locking member 18 has a portion 24 thereof normally extending below arms 19 and said portion has a transverse bore 25, through which extends the lower run 26 of a ring member 27 desirably oval shaped and of resilient material such as spring steel. The ring member 27, which is thus pivotally mounted on the locking member, is substantially centered with respect thereto as by means of a pair of annular stops 28 affixed to the lower run 26 of ring 27 and straddling the locking member 18.

The portion of the upper run 31 of ring 27 opposed to the pivotally mounted portion of the lower run 26, is designed to be moved into and out of locking engagement with a laterally extending hook 32 which is desirably formed integral with a substantially rectangular block 33. As shown in Figs. 2 and 3, the hook 32 has a concave seat 34 in its upper surface to be engaged by the upper run 31 of the ring so that it will remain in locked position.

The inner surface 35 of block 33 desirably has a multiplicity of inclined parallel teeth 36 extending thereacross to mate with complementary inclined parallel teeth 37 on the outer surface 38 of a mounting pad 39. The mounting pad 39 which is also rectangular in shape and of greater width than block 33 is secured as by welding to the side wall 12 of the hatch cover. The inner surface 41 of pad 39 has recesses 42, 43 near its lower and upper ends 44, 45 and inclined parallel slots 46, 47 are provided in the pad in alignment with the recesses 42, 43 respectively.

To secure the latch hook block 33 to the mounting pad 39, holes 48, 49 are provided through the block near each end thereof respectively which may be aligned with the inclined slots 46, 47. Extending through the aligned holes and slots are bolts 51, 52 each of which has a nut 53, 54 screwed on the inner end thereof in the associated recess 42, 43.

With the latch in the locked position shown in Fig. 2, the longitudinal axis of the lower run 26 of the ring member will be slightly to the right of the pivotal axis of the locking member 18. In this position, the runs 26, 31 of the ring 27 will be pulled apart slightly so that the run 31 will be retained under tension against the seat 34. By reason of such tension the locking member will be urged in a counterclockwise direction from the position shown in Fig. 2, such movement however being restrained by the abutment of the inner surface of the locking member against cross piece 17 of bracket 16. Consequently, the ring 27 will remain in locked position with respect to hook 32.

To open the latch, it is merely necessary to pivot the locking member 18 in a clockwise direction from the position shown in full lines in Fig. 3 to the position shown in broken lines. As the locking member rotates and the axis of the lower run 26 of ring member 27 moves to the left of the axis of pivot 21, the ring member 27 will be stretched slightly and as the lower run moves past pivot 21, the tension on the ring 27 will

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be relieved so that the upper run 31 thereof may be moved outwardly from the hook 32.

With the construction above described there is no need for precise tolerances in the positioning of the hook 27 and the bracket 17. Thus, by merely loosening the bolts 51, 52 the latch hook block 33 may be moved up or down slightly, as desired, the inclined teeth 36 of the block sliding along the complementary inclined teeth 38 of the pad 39. When the block is in the desired position, the bolts may be tightened and by reason of the mating of the multiplicity of complementary teeth 36, 38 over the entire opposed surfaces 37, 35 of the pad and the block, the block will be securely retained against the pad. In addition, although the ring member may stretch slightly after long use, any resultant looseness in the latching action may be taken up by merely raising the block 33 the required amount.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. An adjustable keeper to which may be releasably secured a ring member pivotally mounted at one portion on a pivotally mounted member, said keeper comprising a hook member comprising a block having a hook extending outwardly therefrom and a mounting pad for said block, the adjacent surfaces of said block and said pad having complementary teeth thereacross, extending at an inclination with respect to a line through said hook member and said pivotally mounted member, and means releasably to retain said complementary teeth in engagement for adjustably mounting said hook member to said pad for movement toward and away from said pivotally mounted member and in substantial alignment therewith, the portion of the ring opposed to the pivoted portion thereof being movable toward and away from said hook into and out of locking engagement therewith.

2. The combination set forth in claim 1 in which said pad and said block have openings therethrough adapted to be positioned in alignment, said means extending through aligned openings in said pad and said block to retain adjacent surfaces thereof in engagement, said openings being conformed to permit movement of said block with respect to said pad.

3. The combination set forth in claim 1 in which said pad and said block have openings therethrough adapted to be positioned in alignment, said means comprising a bolt extending through aligned openings in said pad and said block to retain adjacent surfaces thereof in engagement, said pad having recesses in the surface opposed to said block and in communication with the openings in said pad, said pad openings being elongated slots and said block openings being of greater diameter than said bolts for adjustment of the position of said block on said pad.

4. The combination set forth in claim 1 in which said pad and said block have openings therethrough adapted to be positioned in alignment, said means comprising a bolt extending through aligned openings in said pad and said block to retain said complementary teeth in engagement, said pad openings being elongated inclined slots extending parallel to the inclined teeth and said block openings being of greater diameter than said bolts for adjustment of the position of said block on said pad.

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