

PATENT SPECIFICATION

(11) 1 299 211

DRAWINGS ATTACHED

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- (21) Application No. 12330/70 (22) Filed 13 March 1970
 (31) Convention Application No. 22 763 (32) Filed 15 March 1969 in
 (33) Japan (JA)
 (45) Complete Specification published 13 Dec. 1972
 (51) International Classification B63B 19/24
 (52) Index at acceptance
 B7S 16



(54) DEVICE FOR SECURING A HATCH OR LATCHING
 TWO PANELS OF A HATCH COVER

(71) We, ASSOCIATED CARGO GEAR AB, a Swedish Body Corporate, of Gustav Daléngsgatan 8, 417 05 Göteborg, Sweden, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a device for securing a hatch or latching two panels of a hatch cover.

Many different types of mechanisms have been proposed for exerting pressure on the packing between adjacent panels of hatch covers for ships in order to make the hatch covers water-tight. To achieve this a hydraulic system has been used in which a hydraulic cylinder is mounted at one end of a rod or limb, simultaneously operating a number of levers forming part of latching devices. Alternatively a screw advancing mechanism has been used instead of the hydraulic cylinder. The hydraulic system requires switching valves which makes it complicated and expensive when compared to the apparatus having the screw advancing mechanism. The hydraulic system furthermore suffers from various disadvantages, such as the necessity for frequent maintenance. The screw advancing mechanism may provide a higher fastening force, but the operating part must be rotated many times to obtain the desired displacement of the rod. This is both power and time consuming.

An object of the present invention is to provide an improved device for securing a hatch and a hatch cover with such a device for latching two panels of a hatch cover.

The present invention consists in a device for securing a hatch or latching two panels of a hatch cover, comprising at least one bell crank with two arms arranged to be pivotable on a hatch coaming or one panel and a tensioning mechanism arranged to act on one

arm of the said bell crank to cause the other arm of the said bell crank to act to press home the hatch cover or the other panel of the hatch cover, the tensioning mechanism comprising a bracket, a link and a screw advancing mechanism pivotably attached to one end of the link, the screw advancing mechanism comprising a threaded portion and a nut working on said threaded portion, the bracket being fixed against movement longitudinally of the link and having a notch for receiving the threaded portion, whereby the tensioning mechanism can act when the nut abuts the bracket to provide a tension between the bracket and the one arm of the bell crank.

In order to keep the rod or link in a definite position when the screw mechanism is disengaged and thereby preventing the cranks from swinging freely, whereby they may accidentally come into contact with the abutments while the panels are open or closed and thereby may be damaged, the rod or link may be provided with a pawl designed to retain the rod or link in a disengaged position.

The invention extends to a hatch cover provided with such a device.

In the accompanying drawings:—

Figure 1 shows a device for securing a hatch in accordance with the present invention with the mechanism in the engaged position;

Figure 2 shows the same view as in Figure 1, with the mechanism in disengaged position;

Figure 3 shows an elevation of the device shown in Figure 1 with the mechanism in the engaged position;

Figure 4 shows the mechanism of Figure 3 as viewed from above;

Figure 5 shows an elevation of the device according to Figure 1 with the mechanism during the tightening operation;

Figure 6 shows the position of the components of the device according to Figure 1, 90

[Price 25p]

just when the screw advancing mechanism has been released; and

Figure 7 shows the position of the mechanism when locked open.

5 In carrying the invention into effect according to one convenient mode by way of example, the drawings show two adjacent hatch cover panels 1 and 1'. The first hatch cover panel 1 is provided with lugs 2 forming abutments, which are directed towards the second panel 1'. The second panel 1' is provided with bell cranks 3 corresponding to each lug 2. The bell cranks 3 are pivotal about axes 4 perpendicular to the joint between the panels. One arm 3' of each crank 3 is designed to be engaged with or disengaged from the corresponding lug of the first panel by means of an operating link 5, which is swingably supported by a bolt 6 at the other arm 3'' of each lever, whereby the link 5 may be displaced forwards and backwards with respect to the pivots 4 supporting the cranks 3. A screw advancing mechanism 7 has a threaded portion 10 the stem of which is hingeably bolted to one end of the link 5 by a horizontal bolt 8. The threaded portion 10 fits into a notch 11 in a bracket 9 which is secured to the second panel 1', an operating nut 12 is provided on the threaded portion 10. This nut 12 is arranged to engage with the bracket 9. One of the cranks 3, preferably the one adjacent to the screw mechanism, is provided with a projection 13, which has a hole 15 for taking an operating handle 14. This handle may be used for bringing about a longitudinal displacement of the link 5 when the screw advancing mechanism 7 has been released from the bracket.

40 A locking pawl 16 is pivotally secured to the link 5 by a bolt 17. The pawl 16 has a surface inclined upwardly to the direction in which the link 5 is released. The pawl 16 also has a pin 18 projecting in a direction parallel to its pivotal axis and which can rest on the upper edge of the link 5 to maintain the pawl 16 in an inclined position. The pin 18 is set so that the pawl 16 may be slightly rotated. This pawl 16 has a locking step 19 located directly above the bolt 17 and an engaging recess 20 located on its underside. The recess 20 is substantially coplanar with the locking step 19. The second panel 1' is provided with a fixed stop member 21 arranged opposite the pawl 16 and designed to engage in the recess 20. A pin 23 is pivotally mounted on a supporting projection 24 fixed to the second panel 1'. The pin 23 is designed to slide along the inclined upper surface 22 of the pawl 16 and disengageably to co-operate with the locking step 19 of the pawl 16.

The stop member as well as the pin is mounted on the supporting projection 24, and pin 23 is L-shaped and easily pivotally

movable in relation to the supporting projection 24. That arm of the pin 23 which bears against the inclined upper surface 22 of the pawl 16 and engaging the locking step 19 may be provided with a counter weight 25 to bias the pin 23 downwards.

Reference 26 in Figure 1 designates a packing on the first panel 1. A ledge 27 on the second panel 1' co-operates with the packing 26. A ratchet spanner 28 for operating the screw advancing mechanism 7 is shown in Figure 5.

When the nut 12 is in engagement with the bracket 9 of the second panel 1' (Figures 1 and 3) the cranks 3 are in position for engagement with the respective lugs 2 of the first panel 1 and are urged onto the lugs so that the ledge 27 of the second panel 1' is forced against the packing 26 on the first panel 1 for forming a water-tight seal between the two panels. When the screw advancing mechanism 7 is released from the bracket (Figure 6), the link 5 releases the urging action of the cranks 3 upon the respective lugs 2, and the link 5 becoming freely displaceable longitudinally and the cranks can pivot.

In order to prepare the hatch covers for opening the following steps are carried out. First the ratchet spanner 28 is fitted to the operating nut 12 of the screw advancing mechanism 7, which is in fastened state as shown in Figures 1 and 3. The nut 12 is loosened by rotating it on the threaded portion 10. As a result the link 5 is progressively displaced by its own weight in the direction indicated by an arrow in Figure 5. The cranks 3 are thus rotated anticlockwise about their pivots 4, so as to release the lugs 2 from their urging action. The screw advancing mechanism 7 is then swung up from the notch in bracket 9 (Figure 5). Practical experience has shown that it is necessary to turn the spanner 28 less than 20 times to release the threaded portion having a standard pitch as in an ordinary design, and thus the desired number of rotations may be reduced radically in comparison with mechanical apparatus having a conventional screw advancing mechanism.

The screw advancing mechanism 7 is then swung upwards permitting the link 5 to be freely displaced. The operating handle 14 is then inserted into the hole 15 formed in the outermost crank 3. The operating handle 14 is then swung in the direction shown by an arrow in Figure 7, so that the cranks 3 associated with the link 5 are turned from the position shown in Figure 6 to the position shown in Figure 7 permitting the arms 3' of cranks 3 to be sufficiently retracted from the range of movement of the respective lugs 2.

At the same time pawl 16 also moves

together with link 5 and swings around its bolt 17 anticlockwise as viewed on the drawings. The pin 23 slides against the inclined upper surface of the pawl 16 while the latter changes its position as its lower surface moves along the fixed stop member 21. At the position where displacement of the link 5 terminates, the arms 3' of the cranks 3 have been sufficiently retracted from the range of movement of the respective lugs 2. The fixed stop member 21 is located opposite to the recess 20 in the pawl 16 which rotates clockwise in the direction shown by an arrow in Figure 7. Thus the fixed stop member 21 is fitted into recess 20, and simultaneously the swingable pin 23 falls onto the locking step 19. Even when the operating handle 14 is removed link 5 will be securely locked against return movement. Therefore the arms 3' of the cranks 3 are maintained sufficiently retracted from the range of movement of the respective lugs 2. The cranks 3 and lugs 2 are thereby guarded from causing damage to each other.

To secure the hatch cover after the first panel 1 has been lowered onto the second panel 1', the pin 23 is lifted so as to disengage from the locking step 19, while the pawl 16 is also manually turned anticlockwise in the direction opposite to the arrow in Figure 7, thereby releasing the engagement between the recess 20 and the stop member 21. The link 5 will then move back due to its own weight, so that the cranks 3 are displaced to the position shown in Figure 6. Thereafter the screw advancing mechanism 7 is swung in a direction opposite to the arrow in Figure 6, and the threaded rod 10 thereof is fitted in the notch 11 of the bracket 9. The ratchet spanner 28 is fitted on the operation nut 12 which is tightened so that the link 5 is displaced in the direction opposite to the arrow in Figure 5 and the cranks 3 are turned clockwise as viewed in the same Figure. The arms 3' of the cranks 3 will thus engage the respective lugs 2 and so force the packing 26 onto the ledge 27 to seal the hatch cover.

The device for securing a hatch thus described in the specific description of the embodiment provides a screw advancing mechanism, where only the final fastening, or the starting of the release is brought about by a screw mechanism, and where the rest of the operation is achieved by a direct manual displacement of the operating link, so that engagement and disengagement of the cranks is quickly achieved. The lugs 2 could be provided projecting from the edge of a hatch cover while the cranks 3 and the bracket 9 were attached to the hatch coaming.

WHAT WE CLAIM IS:—

1. A device for securing a hatch or

latching two panels of a hatch cover, comprising at least one bell crank with two arms arranged to be pivotable on a hatch coaming or one panel and a tensioning mechanism arranged to act on one arm of the said bell crank to cause the other arm of the said bell crank to act to press home the hatch cover or the other panel of the hatch cover, the tensioning mechanism comprising a bracket, a link and a screw advancing mechanism pivotally attached to one end of the link, the screw advancing mechanism comprising a threaded portion, and a nut working on said threaded portion, the bracket being fixed against movement longitudinally of the link and having a notch for receiving the threaded portion, whereby the tensioning mechanism can act when the nut abuts the bracket to provide a tension between the bracket and the one arm of the bell crank.

2. A device as claimed in claim 1, wherein at least one said bell crank is operable by an operating handle for displacing the link in its longitudinal direction when the screw advancing mechanism has been released from the bracket.

3. A device as claimed in either of claims 1 and 2 wherein the link is provided with one pawl pivotally connected to the link, a recess being provided on the pawl for co-operating with a stop member arranged to be fixed to said one panel to retain the link in an opened position.

4. A hatch cover provided with a device as claimed in any preceding claim, wherein the bell crank, tensioning mechanism, bracket and any said stop member are mounted on a first panel of the hatch cover and are arranged to act on a second panel of the hatch cover to press the two panels of the hatch cover together.

5. A hatch cover as claimed in claim 4, wherein the second panel is provided with one or more lugs projecting toward the first panel and wherein the or each bell crank acts on a respective said lug to press the panels together.

6. A device for securing a hatch substantially as hereinbefore described with reference to the accompanying drawings.

7. A device for latching two panels of a hatch cover substantially as hereinbefore described with reference to the accompanying drawings.

8. A hatch cover provided with a device as claimed in Claim 6 or 7.

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together with link 5 and swings around its bolt 17 anticlockwise as viewed on the drawings. The pin 23 slides against the inclined upper surface of the pawl 16 while the latter changes its position as its lower surface moves along the fixed stop member 21. At the position where displacement of the link 5 terminates, the arms 3' of the cranks 3 have been sufficiently retracted from the range of movement of the respective lugs 2. The fixed stop member 21 is located opposite to the recess 20 in the pawl 16 which rotates clockwise in the direction shown by an arrow in Figure 7. Thus the fixed stop member 21 is fitted into recess 20, and simultaneously the swingable pin 23 falls onto the locking step 19. Even when the operating handle 14 is removed link 5 will be securely locked against return movement. Therefore the arms 3' of the cranks 3 are maintained sufficiently retracted from the range of movement of the respective lugs 2. The cranks 3 and lugs 2 are thereby guarded from causing damage to each other. To secure the hatch cover after the first panel 1 has been lowered onto the second panel 1', the pin 23 is lifted so as to disengage from the locking step 19, while the pawl 16 is also manually turned anticlockwise in the direction opposite to the arrow in Figure 7, thereby releasing the engagement between the recess 20 and the stop member 21. The link 5 will then move back due to its own weight, so that the cranks 3 are displaced to the position shown in Figure 6. Thereafter the screw advancing mechanism 7 is swung in a direction opposite to the arrow in Figure 6, and the threaded rod 10 thereof is fitted in the notch 11 of the bracket 9. The ratchet spanner 28 is fitted on the operation nut 12 which is tightened so that the link 5 is displaced in the direction opposite to the arrow in Figure 5 and the cranks 3 are turned clockwise as viewed in the same Figure. The arms 3' of the cranks 3 will thus engage the respective lugs 2 and so force the packing 26 onto the ledge 27 to seal the hatch cover. The device for securing a hatch thus described in the specific description of the embodiment provides a screw advancing mechanism, where only the final fastening, or the starting of the release is brought about by a screw mechanism, and where the rest of the operation is achieved by a direct manual displacement of the operating link, so that engagement and disengagement of the cranks is quickly achieved. The lugs 2 could be provided projecting from the edge of a hatch cover while the cranks 3 and the bracket 9 were attached to the hatch coaming.

WHAT WE CLAIM IS:—

1. A device for securing a hatch or

latching two panels of a hatch cover, comprising at least one bell crank with two arms arranged to be pivotable on a hatch coaming or one panel and a tensioning mechanism arranged to act on one arm of the said bell crank to cause the other arm of the said bell crank to act to press home the hatch cover or the other panel of the hatch cover, the tensioning mechanism comprising a bracket, a link and a screw advancing mechanism pivotally attached to one end of the link, the screw advancing mechanism comprising a threaded portion, and a nut working on said threaded portion, the bracket being fixed against movement longitudinally of the link and having a notch for receiving the threaded portion, whereby the tensioning mechanism can act when the nut abuts the bracket to provide a tension between the bracket and the one arm of the bell crank.

2. A device as claimed in claim 1, wherein at least one said bell crank is operable by an operating handle for displacing the link in its longitudinal direction when the screw advancing mechanism has been released from the bracket.

3. A device as claimed in either of claims 1 and 2 wherein the link is provided with one pawl pivotally connected to the link, a recess being provided on the pawl for co-operating with a stop member arranged to be fixed to said one panel to retain the link in an opened position.

4. A hatch cover provided with a device as claimed in any preceding claim, wherein the bell crank, tensioning mechanism, bracket and any said stop member are mounted on a first panel of the hatch cover and are arranged to act on a second panel of the hatch cover to press the two panels of the hatch cover together.

5. A hatch cover as claimed in claim 4, wherein the second panel is provided with one or more lugs projecting toward the first panel and wherein the or each bell crank acts on a respective said lug to press the panels together.

6. A device for securing a hatch substantially as hereinbefore described with reference to the accompanying drawings.

7. A device for latching two panels of a hatch cover substantially as hereinbefore described with reference to the accompanying drawings.

8. A hatch cover provided with a device as claimed in Claim 6 or 7.

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