

PATENT SPECIFICATION

(11)

1 516 468

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(21) Application No. 31075/76

(22) Filed 26 July 1976

(19)

(44) Complete Specification published 5 July 1978

(51) INT. CL.² B63B 21/60

(52) Index at acceptance

E2A H24A2A H24D3C

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(54) IMPROVEMENTS IN OR RELATING TO MOORING OR TOWING HOOKS

(71) We, MACHINEFABRIEK MAMPAEY MARINE ENGINEERING B.V., a Dutch body corporate of Merwedestraat 66, Dordrecht, the Netherlands, 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:—

10 The present invention relates to hook device for mooring or towing a vessel.

According to this invention there is provided a hook device for mooring or towing a vessel, comprising a slip hook which is pivotally mounted on a shaft in a hook saddle and a locking mechanism for retaining the hook in an operative position, wherein the locking mechanism comprises a pivotal locking pin which, has an abutment surface against which a part of the hook abuts when in the operative position, a guide member fixed relative to the pin and arranged to coact with said part of the hook for returning the locking mechanism automatically to its locking position when the hook returns to the operative position, at least one ratchet wheel mounted concentrically on the pin, and at least one locking pawl which cooperates with the ratchet wheel to hold the locking pin in its locking position, the device further having an abutment plate which cooperates with an abutment of the locking mechanism for limiting pivotal movement of the locking pin away from its locking position, and means for biasing the locking pawl(s) against the ratchet wheel(s).

Preferably the hook device further comprises a connection piece having a bore for mounting in use on a vertical shaft and being pivotally mounted on a further shaft in the hook saddle remote from the hook and at right angles to said bore, and the hook saddle is formed by a pair of spaced apart plates whose ends have an abutment surface for cooperation with a corresponding abutment surface on the connection piece to define a lower limiting position for pivotal movement of the hook saddle in a vertical plane such that when the

hook saddle is in this limiting position the plane containing the axis of the shaft on which the hook is mounted and the axis of the locking pin is at a downward angle of inclination of 10° or less to the horizontal.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings wherein:

Fig. 1 shows in side view, partly in cross section, a mooring hook according to the invention;

Fig. 2 shows a top view according to Fig. 1; Fig. 3 and 4 show further particulars of the blocking pin and

Fig. 5 shows a variant embodiment according to Fig. 2

The mooring hook shown in the drawing comprises a hook saddle formed by two parallel plates 1 and 2, which are pivotally connected at one end by means of a horizontal pin 3 to a connection piece 5 having a vertical bore 4, in which, in use, is rotatably received a vertical pin, (not shown) such as on a tow-boat, a quay, a mooring buoy or the like.

At their other ends a pin 6 extends between the plates 1 and 2 whereon is mounted a hook generally indicated by 7. The hook 7 comprises an upper hook portion 8, wherebehind can be hooked a mooring hawser, a towing cable or the like, and an arm 9. The end 10 of the arm 9 is adapted to abut against a locking mechanism generally indicated by 11, which is pivotally mounted between the two plates 1 and 2. The mechanism 11 comprises two partly circular side plates 12, and a semi-circular pin 14 fixed between the two plates 12. Also fixed between the two plates 1, 2 and disposed opposite the end 10 of the arm 9, there is a comma-or drop-shaped guide member 15 which together with pin 14 defines a space 13 for the end 10 of the arm 9. The two side plates 12 are each formed as a ratchet by being provided with a step 16 for cooperation with a respective pivotal pawl 17 and with a second step 18 for cooperation with a limit plate 19 mounted between the two plates 1, 2. When the steps 18 abut against the plate 19 the locking mechanism is in the release posi-

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tion as illustrated in Fig. 3. A stop 20 for the hook 8 in the release position is provided. The two pawls 17 are fixed to a rotatable shaft 21 journaled in the two plates 1, 2. In the locking of the locking mechanism the two pawls 17 coact with the steps 16 and retain the pin 14 in the position shown in Figure 1 whereby the arm 9 of the hook is constrained in the space 13. At one end of the pin 21 there is mounted an operating lever 23, which is biased by a return spring 24 urging the locking pin 21 with the pawls 17 towards the locking position. Furthermore there are disposed on top of the plates 1, 2 lugs 25 wherein is mounted a closing arm or hawser protection device 26. Moreover there is provided a through-bore 27 for locking said hawser protection device 26.

In operation and with the locking mechanism holding the arm 9 of the hook locked a pulling force exerted on the hook arm 8 will tend to pivot the hook about the pin 6 thereby tending to lift the end 10 of the arm 9. Such movement is prevented by the pin 14 which consequently experiences a torsional force as the pin 14 cannot rotate since it is retained in the locked position by the pawls 17. By moving the arm 23 in the direction of the arrow 30, the pawls 17 are released, whereafter under influence of the pull force of the mooring hawser, the locking mechanism 11 is released to permit a swivelling movement in the direction of arrow 30 so that the end 10 is released from space 13 and the hook will rotate over approx. 90°. The locking mechanism 11 swivels only until the steps 18 abut against the plate 19. This is shown in Fig. 3; Fig. 4 depicts a top view of the locking mechanism 11. In the release position the locking mechanism 11 is retained as a result of the frictional forces exerted by pawls 17 on the plates 12 under influence of the return spring 24. There may be applied a spring for biasing the locking mechanism 11 towards the release position.

Upon return of the hook 7 to its operative position shown in Fig. 1, the end 10 of the arm 9 moves downwardly, thereby abutting against the rounded front end of the guide member 15. Under influence thereof, the locking mechanism 11 is subjected to a swivel-back movement in a direction opposite to arrow 30 as far as the position shown in Fig. 1, the pawls 17 again coming to abut the steps 16. By means of a very simple movement therefore the hook can be returned to its operative position. It will be clear that this return movement need not be effected necessarily by hand but that also a mechanical, electrical or pneumatical operation is possible. Also for the operation of the lever 23 remote control may be employed. The hawser protection device 26 is only mounted insofar as this is desirable to prevent an unintended pulling away of a hawser in the upward direction.

It is observed that Figs. 1 and 2 show a stop 30 beyond the pivot 3. Through said stops 30 the plates 1, 2 rest against a flat stop surface 31 of the connection piece 5. The stops 30 prevent the mooring hook from swivelling downwardly and e.g. from coming to rest on the ground, which may result in additional wear. In the position shown in Fig. 1, the centerlines of the pivots 3 and 6 lie substantially in the same horizontal plane. It has been established in practice that the pivot 6 may have a slightly lower position but at most so far that the plane through the centerlines of the pivot pin 6 and of the pin 14 is maximally at an angle of 10° from the horizontal. An advantage of providing stops 30 which abut against the connection piece 5 and prevent the mooring hook from coming into contact with the ground is that when it is required to electrically isolate the mooring hook, it will be sufficient to isolate the vertical pin on which the connection piece 5 is mounted relative to the surroundings and that no additional isolation is required adjacent the lower ends of the mooring hook, i.e. that portion which would otherwise swing downwardly onto the ground.

Fig. 5 shows a simplification of plates 1, 2. Whereas according to Fig. 2 the plates are relatively thin, enlarged locations 40, 41 or 42 being welded onto the body plates according to Fig. 5 the body plates are thicker so that it will be sufficient to simply drill cylindrical holes for the various pivoting pins without welding operations being required therefor. To prevent hook 7, by way of its arm 9, from contacting the plates 1, 2, there are disposed on either side of pin 6 between the hook and the plates, spacer sleeves 50. For analogous reasons the locking mechanism 11 is provided with enlarged portions 51.

WHAT WE CLAIM IS:—

1. A hook device for mooring or towing a vessel, comprising a slip hook which is pivotally mounted on a shaft in a hook saddle and a locking mechanism for retaining the hook in an operative position, wherein the locking mechanism comprises a pivotable locking pin which has an abutment surface against which a part of the hook abuts when in the operative position, a guide member fixed relative to the pin and arranged to coact with said part of the hook for returning the locking mechanism automatically to its locking position when the hook returns to the operative position, at least one ratchet wheel mounted concentrically on the pin, and at least one locking pawl which cooperates with the ratchet wheel to hold the locking pin in its locking position, the device further having an abutment plate which cooperates with an abutment of the locking mechanism for limiting pivotal movement of the locking pin



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away from its locking position, and means for biasing the locking pawl(s) against the ratchet wheel(s).

2. A hook device according to claim 1,
5 further comprising a connection piece having a bore for mounting in use on a vertical shaft and being pivotally mounted on a further shaft in the hook saddle remote from the hook and at right angles to said bore, and wherein
10 the hook saddle is formed by a pair of spaced apart plates whose ends have an abutment surface for cooperation with a corresponding abutment surface on the connection piece to define a lower limiting position for pivotal
15 movement of the hook saddle in a vertical plane such that when the hook saddle is in this limiting position the plane containing the

axis of the shaft on which the hook is mounted and the axis of the locking pin is at a downward angle of inclination of 10° or less to the horizontal. 20

3. A hook device substantially as described herein with reference to Figures 1 to 4, or Figures 1 to 4 as modified by Figure 5, of the accompanying drawings. 25

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Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1978.
Published at The Patent Office 25 Southampton Buildings, London, WC2A 1AY
from which copies may be obtained.

