

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) MOORING BUOY

(71) We, AKTIEN-GESELLSCHAFT "WESER" a German body corporate of 28 Bremen 13, Werfstrasse 160, Germany, 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 invention relates to mooring buoys.

Mooring buoys are used for mooring ships in open water, and for hauling or warping ships and as auxiliary devices when ships are coming alongside. A mooring buoy of cylindrical shape with flat top and bottom sides is known. A hawser hook is movable in an upwardly open recess, which hook is formed at one end of a tie rod, while its other end is movably mounted on a horizontal pin, arranged substantially centrally in the buoy. The anchorages of ropes or chains, holding the buoy in its position, also engage the said pin. It is above all disadvantageous that fixing of the hawsers in the hooks is difficult, because the unloaded hooks drop into the recess by their own weight and then assume an unpredictable position, and that the hawser under load cannot be ejected from the hook. More particularly, in flat hawser pulling angles, forces are also transmitted to the buoy which cause the latter to come out of its vertical position.

According to the present invention there is provided a mooring buoy including a slip-hook secured to a support which is pivotally mounted on the buoy, means being provided for so balancing the hook and support that in the normal floating position of the buoy with the hook unloaded, the hook is in an upper position and level with or above an upper surface of the buoy.

The construction of the hawser hooks with a slippable locking device and their mounting in a hook body make it possible to eject the hawser by means of a ripcord, radio remote control or other known means from any desired place. The mounting of the hooks on supports with counteracting forces holding

the unloaded hook in an upper position permits easy insertion of the hawsers in the hooks. Altogether, the invention results in a substantial improvement in the mooring buoy with respect to handling and to the safety of persons active on the buoy.

An advantageous embodiment example of the invention provides a support which is in the form of a double lever pivoting freely on a pin in the buoy, one arm being pivotally connected to the hook body and the other arm carrying a counterpoise. In some cases it may be more expedient, instead of the double lever, to mount a rotatable disc on the pin in the buoy or to construct the double lever in the form of a disc which is connected at one point on its periphery with the hook, which in the upper position is balanced by a counterpoise on the disc.

A particularly advantageous embodiment example is also to be seen according to the invention in that the support may be constructed as a floating member pivotal about the pin in the buoy, the part of the floating member immersed in the water being adjusted in shape and size to the upper position of the unloaded lever.

The arrangement according to the invention is of course also suitable when more than one hawser hook is to be provided on a support or if a number of supports are to be provided with one or more hawser hooks.

Three embodiments of the invention are shown, by way of example, in the drawings in which:—

Figures 1, 4 and 7 show vertical sections through a first, second and third mooring buoys respectively,

Figures 2, 5 and 8 show plan views of the buoys of Figures 1, 4 and 7 respectively, and

Figures 3, 6 and 9 show partial sections of the buoys taken at 90° to the sections of Figures 1, 4 and 7 respectively.

All the embodiment examples have in common a cylindrical buoy 1 with a flat top 2 and also a flat bottom 3. A handrail 4 is mounted on the top of the buoy. Approximately cen-

trally advantageously above the floating water-line, a horizontally disposed pin 5 is mounted in the buoy 1.

In the embodiment of Figures 1 to 3 a freely rotatable disc 6 is mounted on the pin 5. The body 7 of a hawser slip-hook 8 is pivotally secured to the disc at a point on its circumference which thus constitutes a support for the slip-hook. Mounted in the body 7 is a slippable locking device, not shown here because such arrangements are known in principle. A counterpoise 9 is disposed and dimensioned such that it balances the hook 8 in the upper position shown, when it is not loaded by a hawser. The disc 6 is movable in a recess 10 of the buoy, which has a radially extending sector to permit displacement of the hook 8 downwards from the upper position when loaded by the pull of a hawser 11.

The embodiment example of Figures 4 to 6 shows a support 6 constructed in the form of a double lever with the counterpoise 9 on one end of one of the arms, while the free end of the other arm is pivotally connected to the body 7 of the hook 8. Platform-supporting arms 12 are also carried by the lever.

The embodiment example according to Figures 7 to 9 shows a support 6, constructed in the form of a float with its bottom side immersed in the water. This float, pivotally movable on the horizontal pin 5 in a radial sector 10 of the buoy 1, is dimensioned in shape and size such that the lift produced by it corresponds to the action of the counterpoise according to the two embodiments described above.

Common to all the embodiment examples are anchorages of ropes or chains 13 pivoted to the pin 5 in the buoy by straps 14 or the like and leading to any anchoring means on the sea bottom.

In all the embodiments described above the pulling forces in the hawsers are transmitted through the hook 8 and the support 6 to the pin 5 to the anchoring chains 13. In this way the force is not transmitted to the buoy so that it is safe for persons to remain on the buoy while it is in use.

The hawser can easily be inserted into the

hooks and can be ejected from the hook even when under load.

It will be appreciated that more than one hawser hook could be provided on any of the supports 6 and that, the buoys could be modified so as to provide more than one such support.

WHAT WE CLAIM IS:—

1. A mooring buoy including a slip-hook secured to a support which is pivotally mounted on the buoy, means being provided for so balancing the hook and support that in the normal floating position of the buoy with the hook unloaded, the hook is in an upper position on a level with or above an upper surface of the buoy.

2. A buoy according to claim 1 in which the support is one arm of a double lever which is pivotally mounted on the buoy, the other arm carrying a counterpoise weight which constitutes the means for balancing.

3. A buoy according to claim 1 in which the support comprises a disc rotatable on a pin in the buoy, the body of the slip hook being connected one point on the circumference of the disc and a counterpoise weight constituting the means for balancing being connected to another point on the circumference.

4. A buoy according to claim 1 in which the support comprises a float, pivotally mounted on the buoy, the float also constituting the means for balancing.

5. A buoy according to any of claims 1 to 4 in which more than one slip hook is mounted on the support.

6. A buoy according to any of the previous claims in which a member connected to an anchor chain is pivotally connected to the buoy about an axis substantially coaxial with the pivot axis of the support.

7. A buoy substantially as described herein with reference to Figures 1 to 3 or Figures 4 to 6 or Figures 7 to 9 of the accompanying drawings.

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Common to all the embodiment examples are anchorages of ropes or chains 13 pivoted to the pin 5 in the buoy by straps 14 or the like and leading to any anchoring means on the sea bottom.

In all the embodiments described above the pulling forces in the hawsers are transmitted through the hook 8 and the support 6 to the pin 5 to the anchoring chains 13. In this way the force is not transmitted to the buoy so that it is safe for persons to remain on the buoy while it is in use.

The hawser can easily be inserted into the

hooks and can be ejected from the hook even when under load.

It will be appreciated that more than one hawser hook could be provided on any of the supports 6 and that, the buoys could be modified so as to provide more than one such support.

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2. A buoy according to claim 1 in which the support is one arm of a double lever which is pivotally mounted on the buoy, the other arm carrying a counterpoise weight which constitutes the means for balancing.

3. A buoy according to claim 1 in which the support comprises a disc rotatable on a pin in the buoy, the body of the slip hook being connected one point on the circumference of the disc and a counterpoise weight constituting the means for balancing being connected to another point on the circumference.

4. A buoy according to claim 1 in which the support comprises a float, pivotally mounted on the buoy, the float also constituting the means for balancing.

5. A buoy according to any of claims 1 to 4 in which more than one slip hook is mounted on the support.

6. A buoy according to any of the previous claims in which a member connected to an anchor chain is pivotally connected to the buoy about an axis substantially coaxial with the pivot axis of the support.

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