

PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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International Classification:—B 63 b 21/24.

COMPLETE SPECIFICATION.

Improvements in or relating to Anchorage Devices.

5 We, NORTH BRITISH ELECTRIC WELDING COMPANY LIMITED, a British Company, of Whifflet, Coatbridge, Lanarkshire, Scotland, 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 This invention relates to floating anchorage devices. It is known to provide a floating anchorage device with a mooring hook and a cable-slipping hook pivoted to the mooring hook, a tripping lanyard fitted to the cable-slipping hook being effective to cause the mooring cable to be disengaged from the mooring hook when the cable-slipping hook swings to a release position. It is known to fit a counterweight to the cable-slipping hook to ensure that the cable-slipping hook always tends to swing back to its original position. The difficulty has heretofore been that the position for this counterweight must be a compromise position since when the weight is located in the position for providing the most effort for returning the hook it can easily be moved over the top dead centre position if the cable-slipping hook is swung violently to the release position, the cable-slipping hook then becoming biased towards the release position and remaining in that position. If the weight is located in a position in which it cannot be moved over the top dead centre it is in a much less efficient position for returning the cable-slipping hook to the original position. It is an object of the present invention to provide an anchorage device incorporating a cable slipping hook adequately biased to return to its initial position yet which cannot remain in the release position no matter how violently it may be

swung during the cable-slipping operation.

A floating anchorage device according to the invention comprises a mooring hook 45 having a curved portion and a shank connectible to a support structure by a pivot with the opening of the hook upwardly directed and a runway projecting from the shank in the direction away from the curved portion, a cable-slipping hook having a curved portion and a shank pivoted to the mooring hook by a pivot passing through the tip portions of the curved portions of both hooks and so disposed 50 that the curved portions of both hooks are orientated in the same direction, the end of the shank of the cable-slipping hook remote from the curved portion of the hook being formed with a subsidiary hook 55 the opening of which faces in approximately the same direction as the opening of the cable-slipping hook, a link pivoted at one end to the cable-slipping hook, a counterweight in the form of a roller 60 journaled in the link at the other end of the link, the roller being engageable with the runway, and means incorporating a degree of lost motion for causing swinging movement of the cable-slipping hook to be communicated to the link. 70

The means for causing swinging movement of the link may be abutment means carried by the cable-slipping hook and engageable with the link. Alternatively said 75 means may be a cable connecting said other end of the link and the end of the shank of the cable-slipping hook adjacent to the subsidiary hook.

The support structure may be a buoy 80 arranged to be anchored to the sea bed.

The cable connecting the link and the cable-slipping hook may be a wire rope.

The link may be a double link consist-

ing of two parallel members, disposed one on each side of the cable-slipping hook, the roller being located between the members.

A practical embodiment of the invention is illustrated in the accompanying drawing in which 1 denotes a portion of a buoy serving as a support structure, 2 denotes a mooring hook having a curved portion 3 and a shank 4 connected to the supporting structure 1 by a pivot 5, the opening 6 of the hook being upwardly directed, a runway 7 projecting from the shank 4 in the direction away from the curved portion 3. 8 denotes a cable-slipping hook having a curved portion 9 and a shank 10, the cable-slipping hook 8 being pivoted to the mooring hook 2 by a pivot 11 passing through the tip portions of the curved portions 3 and 9 of both hooks, which are so orientated that the curved portions of both hooks curve in the same direction. The end of the shank 10 of the cable slipping hook 8 remote from the curved portion 9 is formed with a subsidiary hook 12 the opening 13 of which faces in approximately the same direction as the opening of the cable-slipping hook 8. 14 denotes a link pivoted at one end at 15 to the cable-slipping hook 8 and connected at the other end to a roller 16 resting on the runway 7, the roller 16 serving as a counterweight. 17 denotes a cable serving as a lost motion connection between the end of the shank 10 of the cable-slipping hook 8 adjacent to the subsidiary hook 12 and to the end of the link 14 connected to the roller 16. 18 denotes a mooring cable and 19 denotes a tripping lanyard.

In practice, when the anchorage device is in its normal position ready to receive a mooring cable the cable-slipping hook is in the position in which the opening of the cable-slipping hook is substantially coincident with the opening 6 of the mooring hook 2 so that a mooring cable engaged with the mooring hook 2 engages the cable-slipping hook 8 as well. In this position the roller counterweight 16 is resting on the runway 7. Any pull on the mooring cable 18 causes the mooring hook 2 to swing about the pivot 5 by which it is connected to the support structure 1 to cause the centre line of the cable 18 to intersect the axis of the pivot 5. The cable-slipping hook 8 moves bodily with the mooring hook 2. A tripping lanyard 19 is engaged with the subsidiary hook 12 during the mooring operation.

To slip the mooring cable 18 the tripping lanyard 19 is pulled and such pull causes the cable-slipping hook 8 to swing about the pivot 11 by which it is connected to the mooring hook 2. The portion of the cable 18 engaged with both

hooks is thus lifted by the cable-slipping hook 8 out of the opening 6 of the mooring hook 2 and is moved past and around the tip of the curved portion 3 of the mooring hook 2 so that it is fully disengaged from the mooring hook 2. A continuing pull on the tripping lanyard 19 causes the cable-slipping hook 8 to swing to the position in which the opening of this hook is facing in the direction towards the line of the mooring cable 18 so that the pull in the cable 18 moves the cable completely clear of the anchorage device. In this position the opening 13 of the subsidiary hook 12 then assumes a position in which the said opening 13 is facing in a direction towards the line of the tripping lanyard 19 so that the tripping lanyard 19 can also be pulled clear. In the initial portion of the swinging movement of the cable-slipping hook 8 to disengage the cable 18 the curved portion 9 of the cable-slipping hook 8 moves in the direction to cause the roller counterweight 16 to roll along the runway 7 while still being supported in the runway. As the cable-slipping hook 8 is pulled to the release position by the tripping lanyard 19 the centre of gravity of the cable-slipping hook 8 moves to the other side of the vertical plane containing the axis of the pivot 11 by which the cable-slipping hook 8 is connected to the mooring hook 2. Before the cable-slipping hook 8 reaches the position in which the centre of gravity approaches said vertical plane the roller counterweight 16 is lifted off the runway 7 by the cable 17 connecting the link 14 to the swinging upper end of the shank 10 of the cable-slipping hook 8 so that the cable-slipping hook 8 remains biased to swing back to its original position even when swung beyond the position necessary to release the mooring cable 18. When the mooring cable 18 and the tripping lanyard 19 are both slipped the roller counterweight 16 causes the cable-slipping hook 8 to swing back towards its original position and the roller counterweight 16 does not come against the runway 7 until the centre of gravity of the cable-slipping hook 8 is on the original side of the vertical plane containing the pivot 11 thus ensuring that the cable-slipping hook 8 will always swing by its own weight to the initial position as soon as it is released so that it is ready to receive another mooring cable.

WHAT WE CLAIM IS:—

1. A floating anchorage device comprising a mooring hook having a curved portion and a shank connectible to a support structure by a pivot, with the opening of the hook upwardly directed and a runway projecting from the shank in the direction away from the curved portion, a

ing of two parallel members, disposed one on each side of the cable-slipping hook, the roller being located between the members.

A practical embodiment of the invention is illustrated in the accompanying drawing in which 1 denotes a portion of a buoy serving as a support structure, 2 denotes a mooring hook having a curved portion 3 and a shank 4 connected to the supporting structure 1 by a pivot 5, the opening 6 of the hook being upwardly directed, a runway 7 projecting from the shank 4 in the direction away from the curved portion 3. 8 denotes a cable-slipping hook having a curved portion 9 and a shank 10, the cable-slipping hook 8 being pivoted to the mooring hook 2 by a pivot 11 passing through the tip portions of the curved portions 3 and 9 of both hooks, which are so orientated that the curved portions of both hooks curve in the same direction. The end of the shank 10 of the cable slipping hook 8 remote from the curved portion 9 is formed with a subsidiary hook 12 the opening 13 of which faces in approximately the same direction as the opening of the cable-slipping hook 8. 14 denotes a link pivoted at one end at 15 to the cable-slipping hook 8 and connected at the other end to a roller 16 resting on the runway 7, the roller 16 serving as a counterweight. 17 denotes a cable serving as a lost motion connection between the end of the shank 10 of the cable-slipping hook 8 adjacent to the subsidiary hook 12 and to the end of the link 14 connected to the roller 16. 18 denotes a mooring cable and 19 denotes a tripping lanyard.

In practice, when the anchorage device is in its normal position ready to receive a mooring cable the cable-slipping hook is in the position in which the opening of the cable-slipping hook is substantially coincident with the opening 6 of the mooring hook 2 so that a mooring cable engaged with the mooring hook 2 engages the cable-slipping hook 8 as well. In this position the roller counterweight 16 is resting on the runway 7. Any pull on the mooring cable 18 causes the mooring hook 2 to swing about the pivot 5 by which it is connected to the support structure 1 to cause the centre line of the cable 18 to intersect the axis of the pivot 5. The cable-slipping hook 8 moves bodily with the mooring hook 2. A tripping lanyard 19 is engaged with the subsidiary hook 12 during the mooring operation.

To slip the mooring cable 18 the tripping lanyard 19 is pulled and such pull causes the cable-slipping hook 8 to swing about the pivot 11 by which it is connected to the mooring hook 2. The portion of the cable 18 engaged with both

hooks is thus lifted by the cable-slipping hook 8 out of the opening 6 of the mooring hook 2 and is moved past and around the tip of the curved portion 3 of the mooring hook 2 so that it is fully disengaged from the mooring hook 2. A continuing pull on the tripping lanyard 19 causes the cable-slipping hook 8 to swing to the position in which the opening of this hook is facing in the direction towards the line of the mooring cable 18 so that the pull in the cable 18 moves the cable completely clear of the anchorage device. In this position the opening 13 of the subsidiary hook 12 then assumes a position in which the said opening 13 is facing in a direction towards the line of the tripping lanyard 19 so that the tripping lanyard 19 can also be pulled clear. In the initial portion of the swinging movement of the cable-slipping hook 8 to disengage the cable 18 the curved portion 9 of the cable-slipping hook 8 moves in the direction to cause the roller counterweight 16 to roll along the runway 7 while still being supported in the runway. As the cable-slipping hook 8 is pulled to the release position by the tripping lanyard 19 the centre of gravity of the cable-slipping hook 8 moves to the other side of the vertical plane containing the axis of the pivot 11 by which the cable-slipping hook 8 is connected to the mooring hook 2. Before the cable-slipping hook 8 reaches the position in which the centre of gravity approaches said vertical plane the roller counterweight 16 is lifted off the runway 7 by the cable 17 connecting the link 14 to the swinging upper end of the shank 10 of the cable-slipping hook 8 so that the cable-slipping hook 8 remains biased to swing back to its original position even when swung beyond the position necessary to release the mooring cable 18. When the mooring cable 18 and the tripping lanyard 19 are both slipped the roller counterweight 16 causes the cable-slipping hook 8 to swing back towards its original position and the roller counterweight 16 does not come against the runway 7 until the centre of gravity of the cable-slipping hook 8 is on the original side of the vertical plane containing the pivot 11 thus ensuring that the cable-slipping hook 8 will always swing by its own weight to the initial position as soon as it is released so that it is ready to receive another mooring cable.

WHAT WE CLAIM IS:—

1. A floating anchorage device comprising a mooring hook having a curved portion and a shank connectible to a support structure by a pivot, with the opening of the hook upwardly directed and a runway projecting from the shank in the direction away from the curved portion, a



5 cable-slipping hook having a curved portion and a shank pivoted to the mooring hook by a pivot passing through the tip portion of the curved portions of both hooks and so disposed that the curved portions of both hooks are orientated in the same direction, the end of the shank of the cable-slipping hook remote from the curved portion of the hook being formed with a subsidiary hook the opening of which faces in approximately the same direction as the opening of the cable-slipping hook, a link pivoted at one end to the cable-slipping hook, a counterweight in the form of a roller journalled in the link at the other end of the link, the roller being engageable with the runway, and means incorporating a degree of lost motion for causing swinging movement of the cable-slipping hook to be communicated to the link.

25 2. An anchorage device as claimed in claim 1 in which the means for causing swinging movement of the link is abutment means carried by the cable-slipping hook and engageable with the link.

3. An anchorage device as claimed in claim 1 in which the means for causing swinging movement of the link is a cable connecting said other end of the link and the end of the shank of the cable-slipping hook adjacent to the subsidiary hook. 30

4. An anchorage device as claimed in claim 3 in which the cable connecting the link and the cable-slipping hook is a wire rope. 35

5. An anchorage device as claimed in claim 1 in which the link is a double link consisting of two parallel members disposed one on each side of the cable-slipping hook, the roller being located between the members. 40

6. An anchorage device substantially as described with reference to the accompanying drawing. 45

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