

- [54] SELF-MOORING OF A SHIP TO A
ONE-POINT MOORING BUOY
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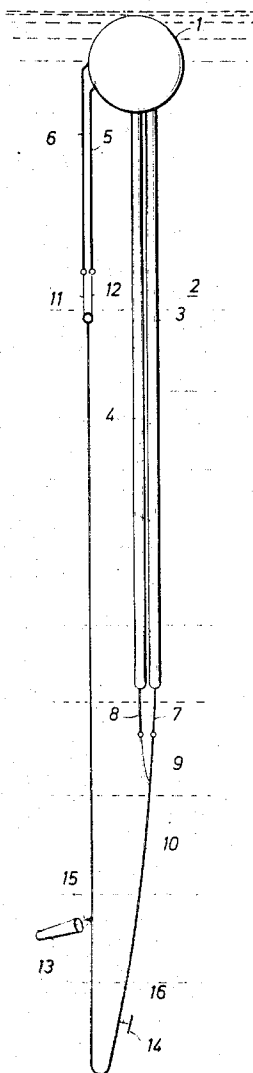
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[51] Int. Cl..... B63b 35/00, B63b 21/52
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114/230

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[57] ABSTRACT

A method and apparatus for self-mooring a ship to a one-point mooring buoy, the mooring cables and floating hoses of the one-point mooring buoy being kept in a stretched condition by a hollow cone and drag offering resistance to the water current so that the ship can easily pick up the mooring cables and hoses by means of a grapple.

4 Claims, 4 Drawing Figures



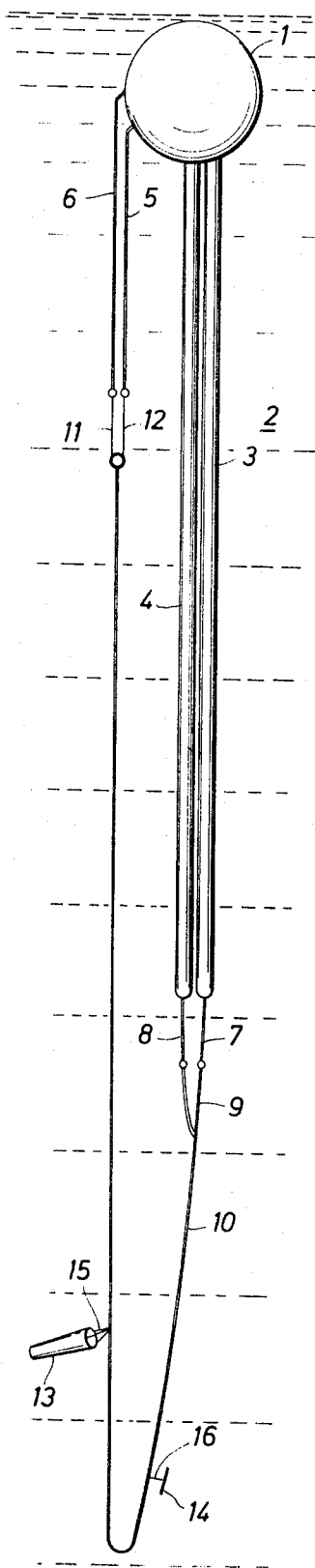


FIG. 1

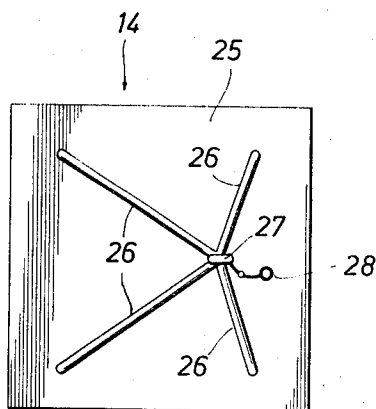


FIG. 3

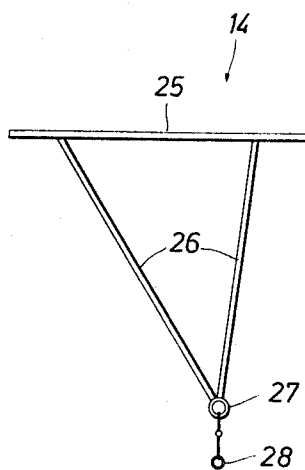


FIG. 4

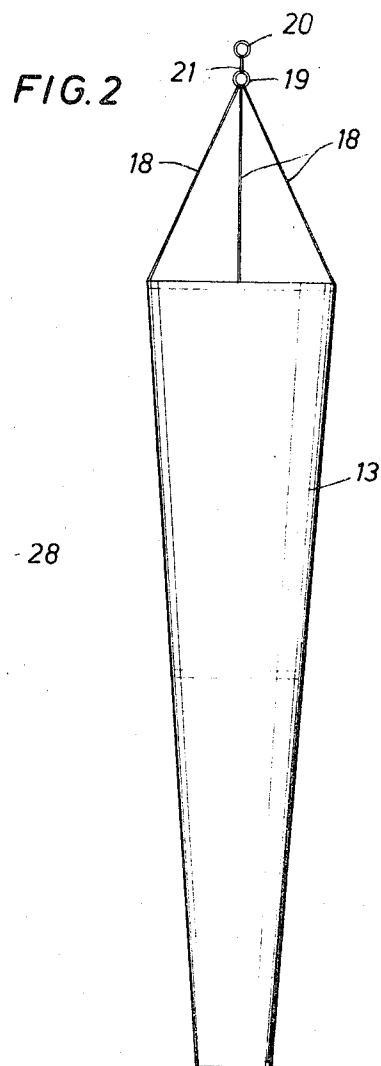


FIG. 2

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SELF-MOORING OF A SHIP TO A ONE-POINT MOORING BUOY

BACKGROUND OF THE INVENTION

The invention relates to a method and apparatus for the self-moorings of a ship to a one-point mooring buoy for loading or unloading a fluid into or from a ship.

One-point mooring buoys for loading or unloading a fluid into or from a ship are widely known and are being used in increasing numbers. In use the ship is fastened by its bow to the one-point mooring buoy by means of a mooring cable in such a manner that the ship is capable of swinging around the buoy with its bow pointing towards the buoy. The one-point mooring buoy is provided with the mooring cable and with a hose floating on the water, which hose is coupled to the ship after the latter has moored to the one-point mooring buoy, whereupon the loading or unloading of the fluid via the hose and the one-point mooring buoy is commenced. For the purpose of mooring the ship to the one-point mooring buoy and for connecting the floating hose to the ship, use is normally made of a manned mooring launch.

However, in locations where the sea is very rough during a large part of the year the mooring launch cannot be used to assist in mooring the ship and connecting the floating hose. In these circumstances, it would be advantageous to have a method and an apparatus allowing the ship to moor to the buoy and to connect the floating hose to the ship without the assistance of a manned mooring launch.

BRIEF SUMMARY OF THE INVENTION

To this end, the invention relates to a method for the self-moorings of a ship to a one-point mooring buoy for loading or unloading of a fluid into or from a ship, wherein a rope is secured to the free ends of the buoy's mooring cable and floating hose and wherein means offering resistance to the water current are secured to the rope in such a manner that a loop is formed by the rope maintaining the buoy's mooring cable and floating hose permanently in a stretched condition by forces acting on the mooring cable and the floating hose and created by the water current, subsequently picking up the loop together with the mooring cable and the floating hose from on board an arriving ship, connecting the mooring cable and the floating hose to the ship and finally loading or unloading the fluid into or from the ship.

A system for use with the above method comprises, according to the invention, a one-point mooring buoy, provided with a mooring cable and a floating hose, wherein a rope is secured to the free ends of the buoy's mooring cable and floating hose and wherein means offering resistance to the water current are secured to the rope in such a manner that a loop is formed by the rope and that the mooring cable and the floating hose are maintained in a stretched condition.

BRIEF DESCRIPTION OF THE DRAWING

The invention will now be described with reference to the drawings which represent an embodiment of the invention.

FIG. 1 is a top plan view of a mooring system according to the invention.

FIG. 2 shows in detail a side view of a cone for use in the system according to the invention.

FIG. 3 shows in detail a top plan view of a drag for use in the system according to the invention.

FIG. 4 shows a side view of the drag according to FIG. 3.

DESCRIPTION OF A PREFERRED EMBODIMENT

In FIG. 1, a conventional one-point mooring buoy 1 is shown schematically. This buoy 1 is floating in the water 2 and is anchored in a conventional manner to the seabed (not shown). The buoy 1 is provided with a pair of floating hoses 3 and 4 of conventional construction. Furthermore, the buoy 1 is provided with a pair of mooring cables 5 and 6, for example made of nylon. By means of wires 7, 8 and 9 an end of a rope 10 is connected to the free ends of the floating hoses 3 and 4. The other end of the rope 10 is connected to the free ends of the mooring cables 5 and 6 by means of wires 11 and 12. A suitable material for the rope 10 is, for example, polypropylene. A hollow cone 13 and a drag 14 are secured to the rope 10, as shown schematically in FIG. 1, by means of nylon cable 15 respectively 16.

The hollow cone 13 is shown more in detail in FIG. 2. It is, for example, made of a suitable textile material or plastic sheet material. The cone is open at both ends so that water is allowed to flow through the inside of the cone. The large end of the cone is provided with cables 18, secured to the periphery of the cone. The free ends of the cables are interconnected by means of a ring 19. Another ring 20 is connected to ring 19 by means of a rope 21.

The drag 14 consists of a rigid plate 25 provided with a number of bars 26. The free ends of the bars 26 are interconnected by means of a ring 27. Another ring 28 is secured to ring 27.

The cone 13 is secured to the rope 10 by means of the nylon cable 15. One end of the nylon cable 15 is secured to the ring 20 and the other end of the nylon cable 15 is secured to the rope 10.

The drag 14 is secured to the rope 10 by means of the nylon cable 16. One end of the nylon cable 16 is secured to the ring 28 and the other end of the nylon cable 16 is secured to the rope 10.

The floating hoses 3 and 4 and the mooring cables 5 and 6 are connected to the turntable of the one-point mooring buoy 1, which is conventional. The cone 13 and the drag 14 are devices offering resistance to the flow of the water. The effect of the friction of the tidal stream or current coupled with any wave action of the cone 13 and on the drag 14 will permanently keep the rope 10, the mooring cables 5 and 6 and the hoses 3 and 4 in a stretched condition. As shown in FIG. 1, the rope 10 is caused to form a loop.

OPERATION

When a ship, for example a tanker, arrives at the mooring buoy 1, a grapple is lowered from the ship and by means of this grapple, the rope 10 is picked up by the ship. After recovering of the rope 10 the latter is heaved in on the winch of the ship. In this manner the ship is heaved towards the one-point mooring buoy 1 until the mooring cables 5 and 6 are securely attached to the bollards of the ship. On completion of the mooring operation by heaving in on the remaining part of the rope 10, access to the floating hoses 3 and 4 is ensured in order to facilitate hose connection. The hoses 3 and 4 are then connected to the ship, whereafter loading or

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unloading of fluid into or from the ship can start and in this manner the ship has moored itself to the one-point mooring buoy without assistance of a manned mooring launch.

The unmooring procedure of the ship is as follows.

After disconnecting the hoses 3 and 4 from the ship, one end of the rope 10 is again connected to the ends of the hoses 3 and 4 and the other end of the rope 10 is again connected to the ends of the mooring cables 5 and 6. Then the floating hoses 3 and 4 are lowered or slipped by means of slip ropes into the sea and allowed to stream parallel to the ship. The mooring cables 5 and 6 are then released from the ship's bollards and as the ship gathers sternway during unberthing, the rope 10 remaining onboard is payed out from about midship and the cone 13 and drag 14 are launched. Then the berth is left ready to receive the next self-mooring ship.

It is to be understood that instead of using two floating hoses, it is possible to use only one floating hose or more than two floating hoses. Also, instead of using two mooring cables, it is possible to use only one mooring cable or more than two mooring cables. Furthermore, instead of using one cone and one drag, it is possible to use two or more cones and drags.

I claim as my invention:

1. An apparatus for self-mooring of a ship to a one-point mooring buoy for loading or unloading a fluid into or from a ship, comprising:

- a one-point mooring buoy;
- a mooring cable being connected to said mooring buoy;
- a floating hose being connected to said mooring buoy;
- a rope being connected at its free ends to said mooring cable and floating hose;

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a means offering resistance to the water current being connected to said rope comprising first means for maintaining said mooring cable and floating hose permanently in a stretched condition and second means spaced from said first means for forming an open loop with said rope.

2. The apparatus of claim 1 wherein the means offering resistance to the water current comprises:

- a drag being connected to said rope; and
- a hollow cone open on both ends being connected to said rope.

3. A method for self-mooring of a ship to a one-point mooring buoy for loading or unloading a fluid into or from a ship which comprises:

- connecting a rope at its free ends to the mooring cable and floating hose on said buoy;
- attaching to said rope a first means offering resistance to water current;
- attaching to said rope a second means offering resistance to said water current spaced from said first means;
- subjecting said first and second means to said water current;
- spreading the mooring cable from said floating hoses to form a loop by forces acting on said first and second means;
- picking up said loop from onboard a ship;
- heaving in said rope by means onboard ship until said mooring cable is securely attached to said ship; and
- connecting said hose to said ship.

4. The method of claim 3 wherein the loop in said rope is picked up from onboard ship by use of a grapple lowered from said ship.

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