Dec. 11, 1962 L. O. K. NORLIN 3,067,716

MOORING DEVICES

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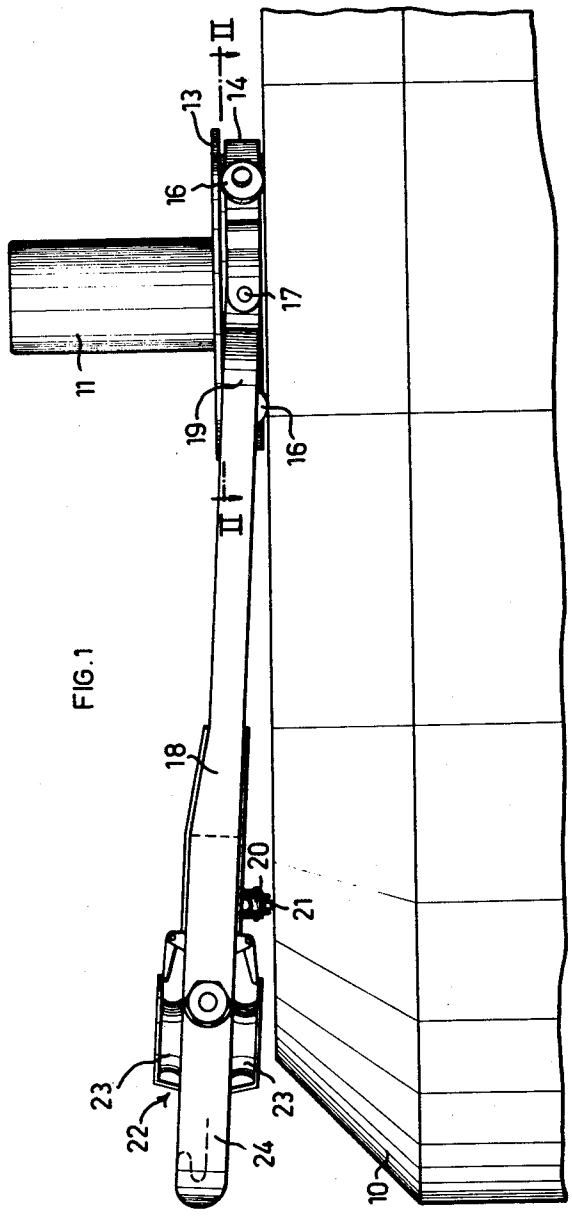


FIG. 1

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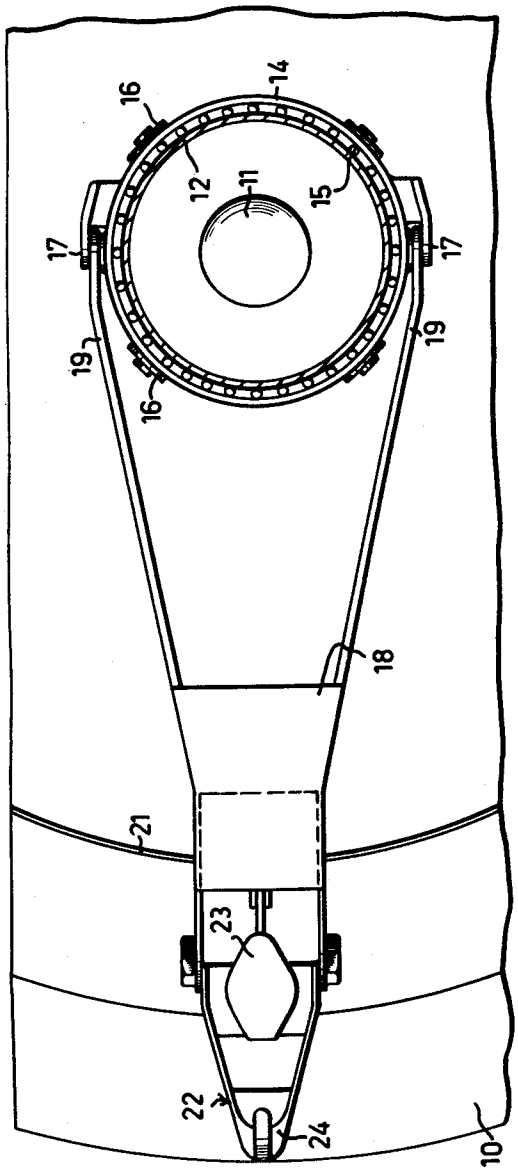


FIG. 2

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United States Patent Office

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MOORING DEVICES

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Claims priority, application Sweden Mar. 18, 1961
1 Claim. (Cl. 114—230)

This invention relates to a device in a buoy for so mooring ships to the buoy that they can swing about it.

The primary object of the invention is to secure a mooring means for belaying mooring ropes or chain cables in such a way to the buoy that the forces transferred from the mooring ropes etc. to the buoy are distributed and do not give rise to great point loads and that especially upwardly directed force components are given a suitable point of attack on the buoy so as not to cause it to turn over.

Further objects of the invention and the advantages thereof will become apparent from the following description, reference being had to the accompanying drawings, in which:

FIG. 1 is a side elevational view of the mooring device;

FIG. 2 is a plan view thereof partly in section on line II—II in FIG. 1.

The drawings show the mooring device mounted on a circular buoy which is but fragmentarily illustrated.

In the drawings, **10** designates the buoy which is supposed to serve to transfer liquid load between a ship moored to the buoy and a liquid depot located on the bottom of the sea or on a neighbouring shore. For this purpose the buoy is equipped with a centrally located pipe swivel indicated at **11**.

The mooring device comprises a collar **12** disposed centrally on the upper side or deck of the buoy and projecting above it. At the upper edge said collar has an outwardly directed flange **13**, which together with the deck and the collar form an outwardly open U-profile. Disposed in said U-profile is a ring **14** which by means of rollers **15** is journalled on the collar to transmit radial forces and by means of rollers **16**, carried by the ring, is guided with clearance between the deck of the buoy and the flange **13** to transmit upwardly and downwardly directed vertical forces.

The ring **14** has two diametrically projecting pivot pins **17**, and an arm **18** which is fork-shaped at one end has its fork prongs **19** mounted on the pivot pins **17** with the arm directed radially outwardly from the ring. Near the free end the arm **18** has a roller **20** so that it can readily swing about the center of the ring **14** with the roller **20** running on a rail **21** attached to the deck of the buoy.

At the free end the arm **18** has a belaying means **22** including a double snatch block **23** for ropes and a hook **24** for a chain cable.

The construction illustrated provides a force transmitting device between the belaying means **22** and the buoy, more particularly the collar **12**, which device is advantageous in various aspects. The horizontal pull component is distributed over almost half the circumference of the collar **2** and the ring **14**, and when the arm **18** is swung horizontally because it is not aligned with the mooring, the swinging force will get favourable points of attack on the ring **14**, viz. the two pivot pins **17**. When a large ship is moored to the buoy by a short rope or chain cable which slants steeply upward from the buoy the vertical component of the pull has a central point of attack on the buoy and thus is not able, in combination with the anchoring of the buoy to the bottom of the sea, to cause the buoy to heel over. Furthermore the vertical force is distributed by the ring **14** and the rollers **16** to several points along the circumference of the flange **13**. Collectively, these features imply that the mooring device—although not very heavily dimensioned—is capable of holding large ships against wind and current.

What I claim and desire to secure by Letters Patent is:

In a buoy having a fixed deck, a device for mooring ships to the buoy comprising a circular collar projecting above the deck, a flange extending from the upper edge of the collar and thus forming together with the collar and the deck an outwardly open U-profile, a ring situated within the U-profile, a first annular row of rollers by which the ring is journalled on the collar to transfer radial forces, a second annular row of rollers by which the ring is guided between the deck and the flange for transferring upwardly and downwardly directed axial forces, a pair of pivot pins projecting diametrically from said ring, an arm having one end fork-shaped and the fork prongs pivoted on said pivot pins and thus being freely swingable upwards from said deck, and mooring means on the free end of said arm.

No references cited.