April 20, 1965 L. H. J. BRACKX 3,178,737

FLOATING BUOY FOR MOORING OF VESSELS AND TRANSFER OF LIQUIDS FROM THE LAND TO THE VESSEL AND VICE VERSA

Filed Sept. 30, 1963 3 Sheets-Sheet 1

Fig. 1.

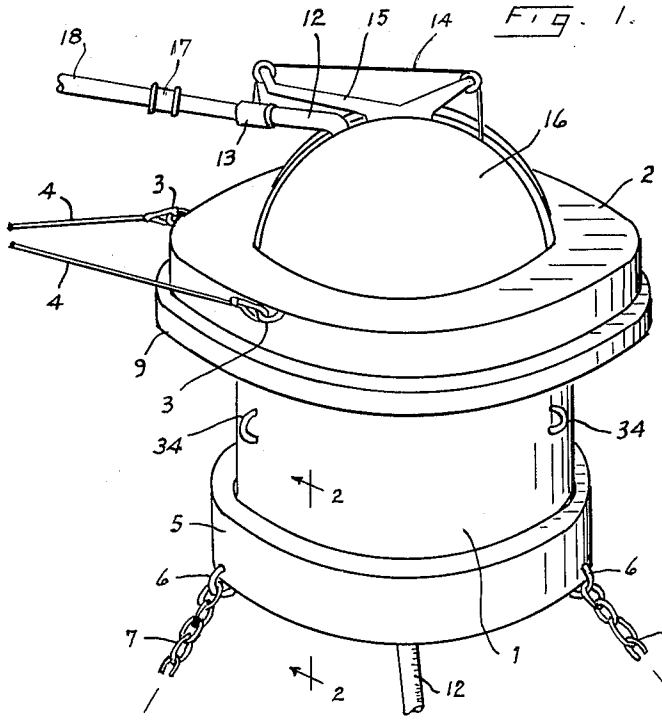
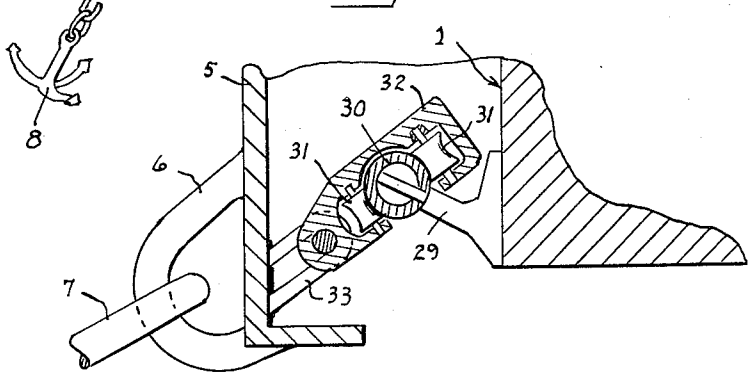


Fig. 2.



INVENTOR.
LAURENT H.J. BRACKX

BY Howard V. Jeandron

AGENT

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Fig. 3.

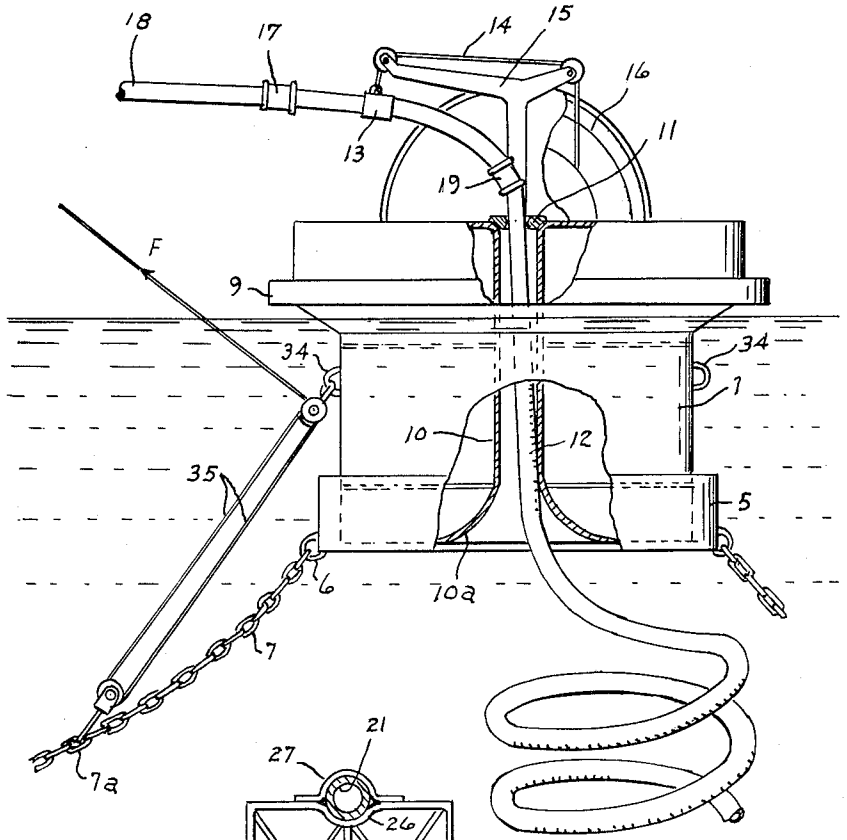
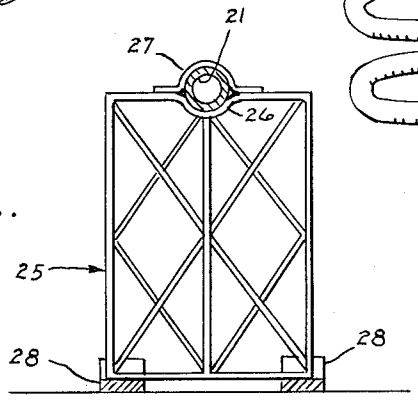


Fig. 6.



INVENTOR.
LAURENT H.J. BRACKX

BY Howard J. Jeandron

AGENT

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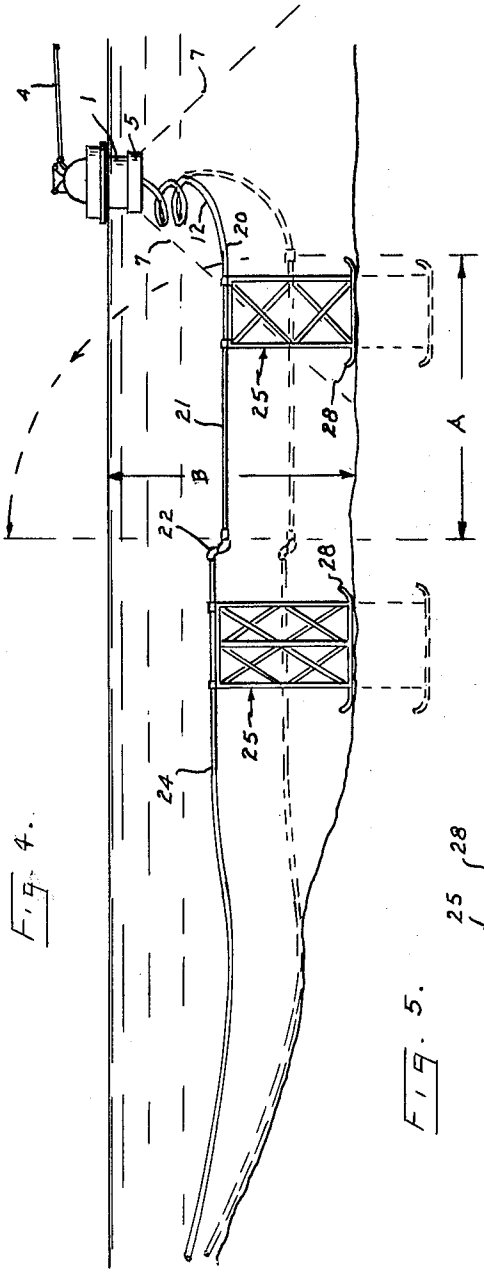


Fig. 4.

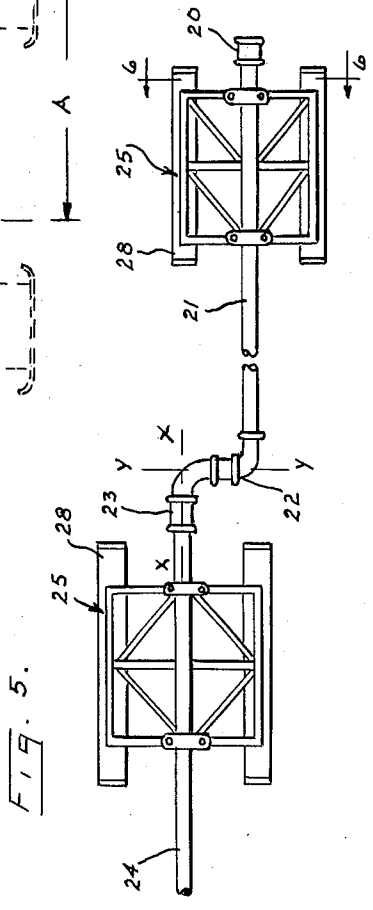


Fig. 5.

INVENTOR.
LAURENT H.J. BRACKX

BY Howard J. Jeambon

AGENT

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FLOATING BUOY FOR MOORING OF VESSELS AND TRANSFER OF LIQUIDS FROM THE LAND TO THE VESSEL AND VICE VERSA

Laurent H. J. Brackx, 47—22 44th St., Woodside, Long Island, N.Y.

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4 Claims. (Cl. 9—8)

This invention relates to floating buoys for the mooring of vessels and more particularly to the transfer of liquids from the vessel to the land and vice versa.

A typical example of application of the buoy in question covered by this invention is that of the discharge of petroleum products from a tanker to an installation such as a refinery, situated on land.

In the inverse case the buoy may be used, for instance, to supply a vessel with some liquid (water, fuel, etc.) from a land installation.

The buoy to which this present invention refers, is equipped in the usual manner with an axial duct traversed by a flexible tubing which can be attached at its upper portion with the vessel and at its lower end with land; such tubing is therefore substantially independent from the body of the buoy.

The object of the present invention is to provide a buoy possessing greater stability than heretofore so that during rough seas the tubing does not move to any material degree and there is no damage to said tubing.

A further object of the present invention is to equip the buoy at the top with fixed attachments for fastening the body of the buoy to the mooring howsers of the vessel and at the lower bottom with anchors that are rotatable around the vertical axis of the body of the buoy itself by means of the anchorage chains at the bottom of the buoy to retain the buoy in a fairly accurate fixed position.

A further object of this invention is to permit the buoy to freely rotate in relation to the fastening pieces of the anchorage chains, following the motions of the vessel to which it is attached caused by wind and currents.

A still further object of this invention is to provide anchor hooks on the anchor chains to fasten the buoy by means of a rotating collar that is provided with rollers, balls, etc. to rotatably retain the lower extremity of the body of the buoy.

Further objects and advantages of this invention shall become evident from the following detailed description and the drawings in which

FIG. 1 is a perspective view of the buoy,

FIG. 2 is a partial cross section on a larger scale taken along the line II—II of FIG. 1,

FIG. 3 is a view in elevation and in partial cross section of the buoy,

FIG. 4 shows the attachment of the buoy with the tubing ending on land,

FIG. 5 is a partial plan view on a larger scale than shown in FIG. 4, and

FIG. 6 is a cross sectional view taken along the line VI—VI of FIG. 5.

Referring to the drawings, FIG. 1 indicates the body of a floating buoy. The buoy 1 is equipped with an upper surface 2 along the periphery of which are arranged rings 3 for ropes 4 for attachment of a vessel to the buoy 1. A collar 5 is mounted to surround the buoy at the lower extremity of the body 1. The body 1 is rotatable within collar 5 by means of rollers or spherical bearings. The collar 5 is provided on its exterior surface with rings 6, for example, four may be provided to permit attaching chains 7 that are each in turn connected to an anchor 8.

The upper portion of the body 1 of the buoy is provided with a buffer or bumper ring 9 of resilient material, for instance wood, for cushioning and collision between the buoy and the vessel to which it is attached. The buoy is traversed axially by a vertical duct 10 (FIG. 3) with a lower extremity 10A which is widened or flared. The duct 10 is lined or provided with an insert 11 at its upper extremity. The lining or insert may be of ebony wood or with some other suitable material to minimize any rubbing and wear of tubing 12 which traverses duct 10.

The tubing 12 is provided with a section which extends above the top of the buoy and is supported by means of a collar 13 and a rope 14 forming part of a crane 15 or similar device for lifting. The crane 15 and hose 12 may be contained in a capsule 16 having a slot for the passage of tubing 12 and the other supporting parts described.

The tubing 12 is connected at its upper end to a joint 17, preferably a rotatable joint. It is in turn connected to a flexible tubing 18 which is in turn connected to the vessel attached to the buoy. A second rotating joint 19 may be placed in the flexible tube 12 in the center duct of the buoy, which permits said central tube to have a substantially vertical travel. The flexible tube 12 is connected at its lower end to a joint 20 (FIG. 5) and in turn to a piece of pipe 21 which, in turn, by means of a rotatable joint 22, 23 is connected to a pipe 24 extending to the land or terminal end. Rotatable joint 22, 23 permits the rotation around two axes, indicated with XX and YY respectively in FIG. 5. The piece of pipe 21 as well as pipe 24 are supported by framework structures 25 equipped with lower flat runner shaped plates 28 permitting the dragging of the supporting framework 25 along the bottom during any movement of the pipes. The framework structures 25 are provided on their upper surface with a curved formation as a seat 26 (FIG. 6) for the pipe 21 and 24 which are retained to the seats 26 by means of screw clamps 27. In FIG. 4 there is shown in full lines the positions assumed by structures 25 and the respective pipe 21 and 24 during rest; on the other hand, there is also indicated by broken lines the positions assumed by pipe 21 and 24 and the respective structures 25 when, after a certain period of use, the base of the structures are submerged. The use of the above structures results in a faster installation of the connecting pipe between the buoy and land and makes it possible to quickly locate the pipe in case of an accidental separation from the buoy. In addition, the length A of the section of pipe 21 corresponds to the depth B of the water level so that by rotating upward the section of pipe 21 around axis YY of joint 22 the end 20 of pipe 21 will be brought above the water level. This facilitates considerably the replacement or connection of the flexible tubing 12 in the event of a damage to the tube 12 as the work in making the connection is above the water level without the need of lifts.

FIG. 2 illustrates an example of one form of mounting the rotating collar 5 equipped with rings 6 for the anchoring of chains 7. According to this embodiment the body 1 of the buoy is provided at the lower portion of its exterior periphery with brackets 29 supporting a track in the form of a ring 30. On this ring 30 there are provided rollers 31 having a concave profile. The rollers are supported by pins which are in turn mounted in supports 32 which in turn are fastened by means of elements 33 to the internal periphery of collar 5.

It is evident that in substitution of the rollers 31 there may be used other rotatable bearings. The exterior surface of buoy 1 is equipped above collar 5 with a series of rings 34 for the anchorage of the spreading devices to cope with or assist in the untangling of the anchor chains.

In FIG. 3 a spreader or block and tackle 35 of the

tiller type connects one of the hooks **34** with a point *7a* of chain **7** at a sufficient distance from the anchorage ring **6** so that by means of a pull provided in the direction of the arrow F, the slack of the chain **7** is recovered, that is, with the tackle rope attached at one end to the upper block, the rope extends down through the lower block around the pulley and up and over the upper pulley and outward as shown. A pull on the rope in the direction F will foreshorten the tackle **35** to take up the slack in chain **7** as described.

It is apparent that while maintaining the principle of the present invention the construction details and forms of the preferred embodiment of the buoy may be considerably varied without departing from the spirit of this invention and the description may be taken as a purely non-limitative example, without departing from the scope of the present invention.

What is claimed is:

1. A floating buoy for a body of water which includes a central floatable body, a rotatably attached anchor ring, anchor chains and anchors, and a flexible hose having rotatable connecting elements and a cranelift for said hose, said floatable body traversed centrally and axially by a duct larger than the flexible hose that is to be passed therethrough, said body also provided with a circular track about the lower periphery, said anchor ring connected to said circular track by a plurality of rollers, said anchor ring provided with a plurality of attaching elements for anchor chains and said chains each connected to an anchor.

2. In a device according to claim 1 in which said central duct is flared outward at the bottom of said floatable body.

3. In a device according to claim 1 in which said central duct is provided with a liner to minimize the frictional wear on said flexible hose.

4. In a device according to claim 1 in which said flexible hose at its lower end is connected to a pipe and in which said pipe is divided into two sections with a rotatable connection between so that the one section of pipe connected to said flexible hose may be swiveled from a flat lying position below the water level to a vertical position having one end above the surface of the water.

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