March 26, 1963 L. HORNBOSTEL ETAL 3,082,439

MOORING BUOY

Filed Feb. 10, 1961 2 Sheets-Sheet 1

Fig. 1

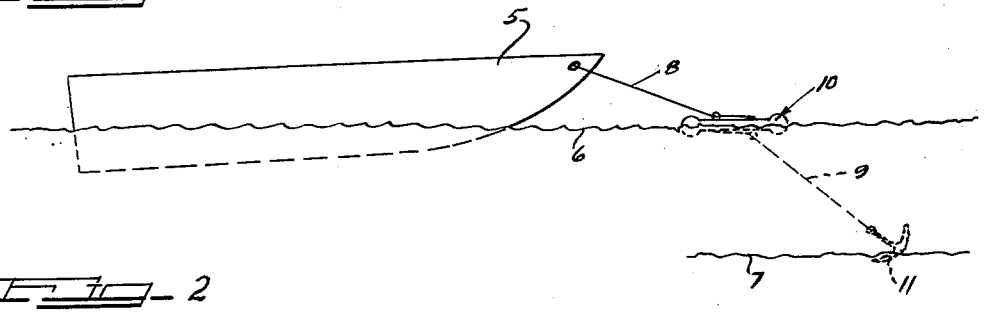


Fig. 2

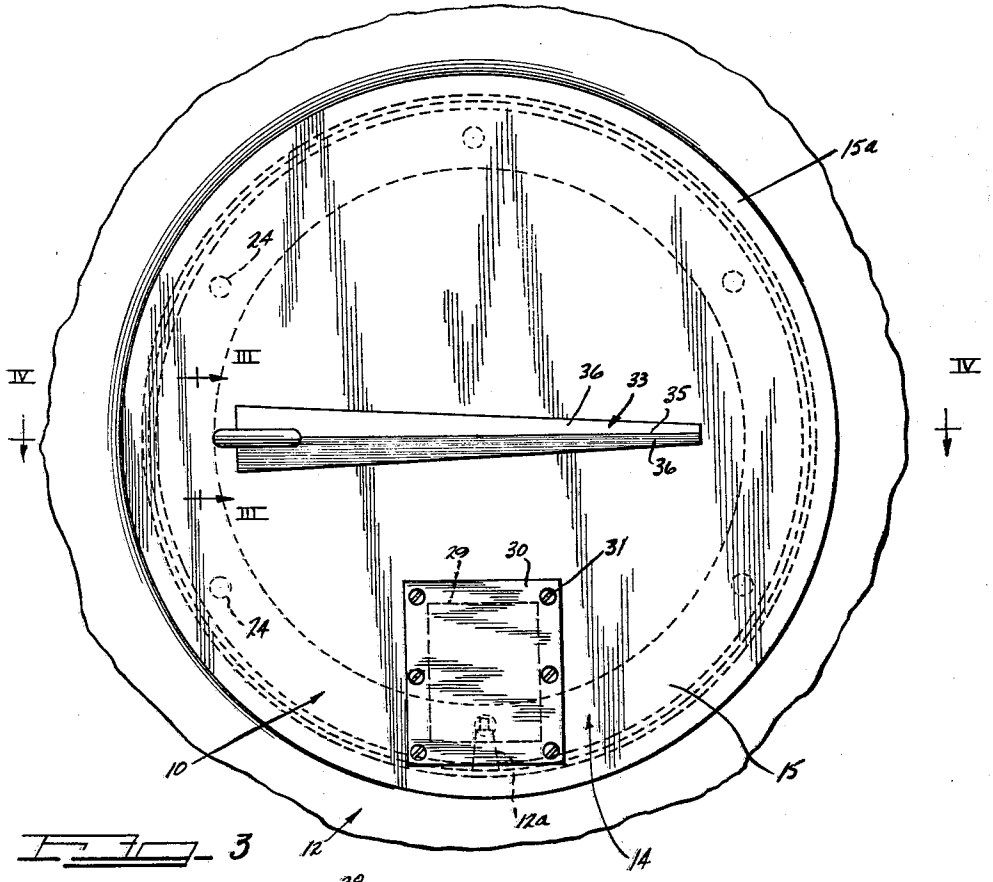
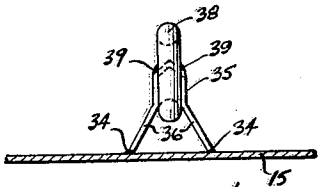


Fig. 3



INVENTORS,
Lloyd Hornbostel
Jay F. Pigman
BY
Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

March 26, 1963 L. HORNBOSTEL ETAL 3,082,439

MOORING BUOY

Filed Feb. 10, 1961 2 Sheets-Sheet 2

Fig. 4

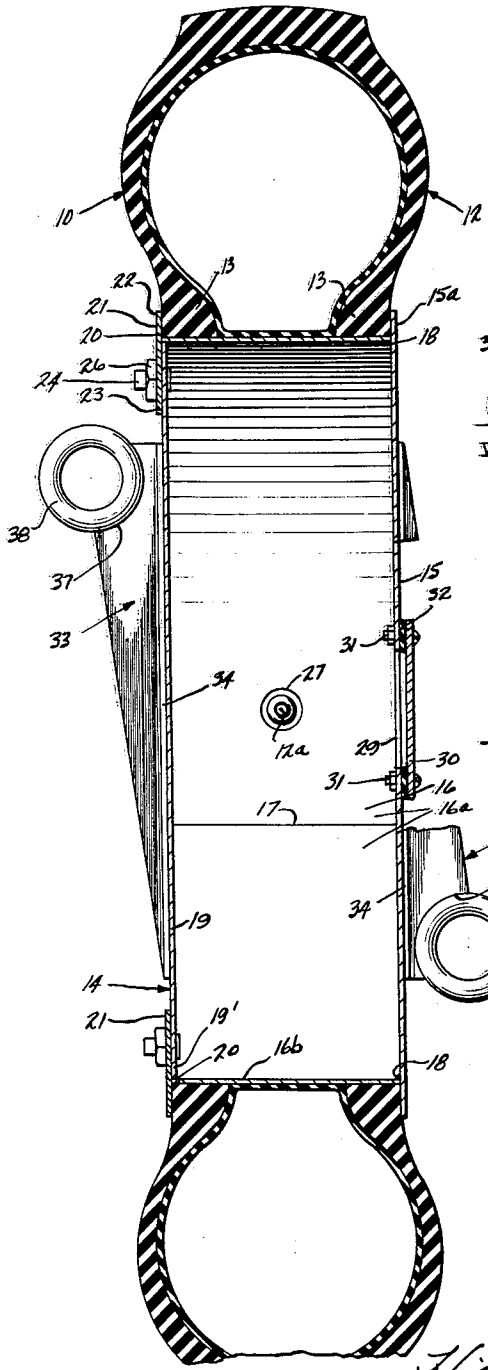


Fig. 5

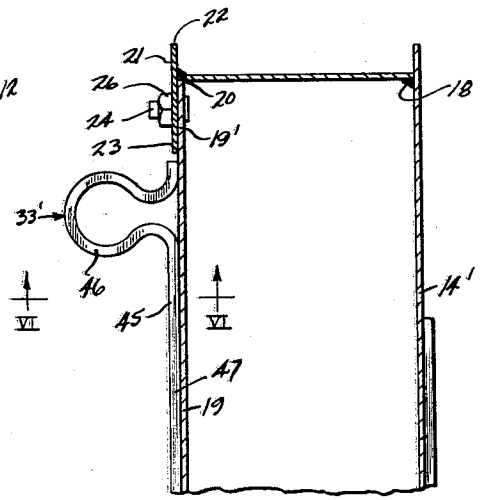
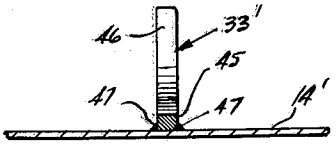


Fig. 6



INVENTORS
Lloyd Hornbostel
Jay F. Pigman

BY

Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

United States Patent Office 3,082,439 Patented Mar. 26, 1963

3,082,439

MOORING BUOY

Lloyd Hornbostel, P.O. Box 214, and Jay F. Pigman, P.O. Box 282, both of Melbourne Beach, Fla.

Filed Feb. 10, 1961, Ser. No. 88,402
5 Claims. (Cl. 9—8)

The present invention relates generally to a mooring buoy for mooring a boat to a lake or ocean or river bottom.

It has been found that conventional types of mooring buoys are not stable enough when subjected to movement caused by wind or water current which tends to cause the buoy to overturn, thus causing a risk of damage to the moored boat or to the other boats in the same vicinity.

The present mooring buoy is of such a construction that the buoy remains stable and it presents a resilient surface of the tire to contact the moored boat during any movement caused by wind or water current. The mooring buoy includes a non-corrosive watertight drum having an anchor ring and a mooring ring on opposite sides of the drum and which rings are offset with respect to one another and offset with respect to a central axis through the buoy so that when this buoy is placed in operation the tendency for the buoy to become overturned is reduced to a minimum. The thickness or vertical dimension of the drum does not exceed the thickness of the tire at its thickest area.

The low profile of the buoy and the location of the mooring rings on the buoy provide a buoy that resists wind driven movement and tendencies for the buoy to overturn. It is in this way that the risk of damage to a moored boat or to other boats moored or moving in the vicinity is minimized.

Another advantage of the present type of buoy is that it may be manufactured more economically than the buoys that are presently available on the market. The drum lends itself to manufacture from strip stock. Another reason for the low manufacturing cost is that the size or the vertical distance between the end plates of the drum is maintained at a minimum and the amount of material required to manufacture a buoy of this type is materially reduced. The center watertight drum may be constructed entirely of a non-corrosive material such as stainless steel and the like and the drum is thus more durable in service than the usual galvanized steel type mooring buoy that is presently available on the market.

An object of this invention is to provide a low profile buoy that resists being overturned due to wind currents directed against it.

Another object of this invention is to provide a mooring buoy having mooring connections on its upper and lower sides offset with respect to one another and with respect to the central drum axis so the buoy can more effectively resist wind currents to avoid being overturned.

Yet another object of this invention is to provide a buoy having a non-corrosive metal drum having an increased life span as compared to the mooring buoys now available on the market.

A still further object of this invention is to provide a mooring buoy which may be manufactured at less cost than the mooring buoys presently available on the market.

According to certain features of the present invention the mooring buoy comprises a buoy and a circular non-corrosive metal drum which is of a hollow construction and formed from sheet metal, the drum structure being provided with a removable plate so that access may be made into the material of the drum enabling air to be directed into the valve stem of the tire which valve stem is disposed within the interior of the drum.

Many other features, advantages and additional objects

of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows in the accompanying sheets of drawings in which two preferred structural embodiments of a mooring buoy are illustrated.

On the drawings:

FIGURE 1 is a diagrammatic view of a boat moored to the bottom of a body of water;

FIGURE 2 is a top plan view of a mooring buoy of the type illustrated in FIGURE 1;

FIGURE 3 is an enlarged cross-sectional view taken substantially on the line III—III looking in the direction indicated by the arrows, as seen in FIGURE 2;

FIGURE 4 is an enlarged cross-sectional view taken substantially on the line IV—IV looking in the direction indicated by the arrows as seen in FIGURE 2;

FIGURE 5 is an enlarged fragmentary view of a modified type of mooring buoy only with the tire omitted; and

FIGURE 6 is an enlarged fragmentary cross-sectional view taken substantially on the line VI—VI looking in the direction indicated by the arrows as seen in FIGURE 5.

As shown on the drawings:

Illustrated diagrammatically in FIGURE 1 is a boat 5 afloat on a surface of water 6 above a lake or ocean bottom 7. The boat 5 is provided with mooring and anchor lines 8 and 9 which lines function to connect a mooring buoy 10 to the boat 5 and to connect the buoy 10 to an anchor 11.

The mooring buoy, according to the features of the present invention, is comprised of a pneumatic tire 12 inflatable by inserting air in a valve stem 12*a*. The tire has circular tire beads 13—13. Mounted on the tire 12 is a sheet metal non-corrosive watertight drum or buoyant circular member 14 which may be manufactured from strip stock such as stainless steel and the like.

The drum 14 includes a first circular drum side wall plate or upper face 15 having an outside diameter slightly in excess of the diameter of the bead 13 so its outer plate margin 15*a* may axially abut against a side wall of the bead 13. The drum 14 further includes a split ring or axially extending ring or annular drum section 16 with its opposite ends 16*a*—16*a* welded together at 17. The section 16 is welded to the side wall plate 15 at 18 with the weld 18 being disposed radially inwardly of the outer marginal edge 15*a* of the side wall plate 15.

The drum 14 further includes a second circular side wall plate or lower face 19 having an outer marginal edge 19' engaged and welded in abutment with an inside surface 16*a* of the drum section 16 at 21. Mounted on the second circular wall plate 19 is a radially extending ring 21 having an outer margin 22, the outer margin 22 having an outside diameter in excess of the diameter of the bead 13 and disposed radially outwardly of the bead 13 for axial engagement with the bead 13. An inner radial ring margin 23 laps and axially confronts and engages against the second plate 19. The second plate 19 is provided with angularly arranged threaded studs 24 which are welded in assembly with the second plate 19. The threaded studs extend through stud openings in the plate 19 and through openings in the radially extending ring 21, and nuts 26 are threaded onto the threaded studs to secure the radially extending ring to the second plate 19. It will be appreciated the outer margin 15*a* of the first plate 15, the axial ring 16 and the outer margin 22 of the second ring define a tire rim on which tire rests.

As will be seen in FIGURE 4 the tire 12 is movable axially onto and off of the axially extending ring 16 to effect assembly of the tire and the drum 14 with respect to one another. The radial ring 21 is provided to clamp the bead of the tire 12 in assembly with the drum 14.

The drum 14 is further provided with a valve stem

opening 27 in the ring 16 through which a valve stem 28 projects into the interior of the ring 16. A valve stem cover plate opening 29 is provided in the first plate 15 in axially aligned relation with respect to he valve stem 28 to facilitate inflation of the tire 11. A cover plate 30 is clamped to the first plate 15 over the opening 29 by means of nut and bolt fasteners 31. A gasket 32 underlies the cover plate and overlies the edge defining the opening 29 so a watertight seal may be provided when the cover plate 30 is clamped over the cover plate opening 29.

A pair of identical generally U-shaped brackets or connections 33 are provided for attachment with the mooring and anchor lines 8 and 9. The brackets are welded at 34 as indicated in FIGURE 3 to the first and second plates 15 and 19. Each of the brackets or connections includes a U-shaped portion 35 with divergent leg portions 36 welded as indicated at 34 to the associated drum plate.

Each of the brackets at the closed end of the U has an arcuate notched out area 37 providing a seat for a ring 38 and the ring 38 is welded at 39 to the bracket edges defining the notched out area 37. It will be noted the brackets 33 each extend radially across the central axis of the drum to provide an adequate support base for the ring 38. The rings 38 are offset with respect to one another and with respect to the central or axial axis of the drum. It will further be noted the rings 38 and the central axis are disposed in a common vertical plane so as to be capable of more effectively coacting with the anchor and the boat.

The particular advantage of the above described construction is that the buoy remains stable, presenting the resilient surface of the tire to contact the moored boat during any movement caused by wind or water current. By offsetting the anchor ring and the mooring ring with respect to the central axis, while keeping the vertical distance between them short, the overturning force is reduced to a minimum. Thus, the risk of damage to the moored boat or to other boats moving in the vicinity is minimized.

The low profile results in relatively less wind driven movement of the buoy itself than the movement of the moored boat. This, and the offset of the two rings, tends to keep the mooring line generally straight. This reduces the chance of fowling of the lines and the possibility that the anchor might be lifted by too short a mooring line.

In FIGURES 5 and 6 is a modified buoy 10' that is identical with the buoy 10 except with regards to its connections or brackets 33'. In this instance each of the brackets comprises a strip stock piece 45 having an intermediate loop 46 defining a mooring or anchor line ring disposed between opposite ends of the strip. The strip is welded at 47 to the drum 14' in the same way as the connection 33 so that the rings 46 in the central drum axis are in a common vertical plane and with the rings 46 on opposite sides of the central drum axis.

In both forms of our invention all of the component parts of the drums including the nuts, bolts, brackets and the like are preferably made from a non-corrosive material such as stainless steel.

We claim as our invention:

1. A mooring buoy including a pneumatic tire having a valve stem and a buoyant circular non-corrosive drum member on which said tire is mounted, the drum member having said valve stem projecting into its interior, said drum member having a sealed removable plate on one of its faces permitting access to be gained to the interior of the drum member and to the valve stem for inflating the pneumatic tire, said member having upper and lower opposite faces with one face provided with only one anchor line connection and the other face being provided with only one boat mooring line connection and with the connections being offset radially from a central axis of the member, and said connections being on opposite sides of said central axis and said member so that upon pulling forces being applied to said member the forces exerted on said connections will react against each other to assist in resisting overturning of the member.

2. A mooring buoy including a pneumatic tire having a valve stem and a buoyant circular stainless steel drum member on which said tire is mounted, the drum member having said valve stem projecting into its interior, said drum member having a sealed removable plate on one of its faces permitting access to be gained to the interior of the drum member and to the valve stem for inflating the pneumatic tire, said member having upper and lower opposite faces with one face provided with only one anchor line connection and the other face being provided with only one boat mooring line connection and with the connections being offset radially from a central axis of the member, and said connections being on opposite sides of said central axis and said member so that upon pulling forces being applied to said member the forces exerted on said connections will react against each other to assist in resisting overturning of the member, said connections each comprising a U-shaped bracket having ends of the U secured to one of said faces and having a ring secured to said bracket.

3. A mooring buoy including a pneumatic tire having a valve stem and a buoyant circular non-corrosive drum member on which said tire is mounted, the drum member having said valve stem projecting into its interior, said drum member having a sealed removable plate on one of its faces permitting access to be gained to the interior of the drum member and to the valve stem for inflating the pneumatic tire, said member having upper and lower opposite faces with one face provided with an anchor line connection and the other face being provided with a boat mooring line connection and with the connections being offset radially from a central axis of the member, and said connections being on opposite sides of said central axis and said member so that upon pulling forces being applied to said member the forces exerted on said connections will react against each other to assist in resisting overturning of the member, said connections each comprising a one piece radially extending strap secured to one of said faces and having a loop providing a ring between its opposite ends.

4. A mooring buoy including a pneumatic tire having beads at its inner tire margin and a buoyant circular non-corrosive sheet metal drum carrying said tire, said drum including a first circular sheet metal drum side wall plate having a diameter in excess of an inside diameter of said beads and for abutment against an axially outer side of one of said beads, a sheet metal strip having its opposite ends secured together providing an axially extending ring having an outside diameter closely approximating the diameter of said beads for supporting the beads on said drum, the axially extending ring being joined with said first plate radially inwardly of an outer marginal edge of said first plate, a second circular sheet metal drum side wall plate having a diameter less than the diameter of said beads and with said second plate being secured in assembly with said radial ring, a sheet metal radially extending ring having inner and outer margins with the inner margin engaged against said second circular plate and with the outer margin engaged against an axially outer side of another of said beads, means securing said radially extending ring in removable assembly with said drum so that when the radilly extending ring is detached from the drum the beads of the tire may be moved axially over and onto said axially extending ring and so that when the radially extending ring is attached to the drum the beads are clamped axially between an outer margin of said first plate and said radially extending rings, the axial dimension of the drum not exceeding the axial dimension of the tire at its thickest area so the buoy is subject to less

wind driven movement, and a line anchoring connection on each of said plates for joining the buoy with a boat and with an anchor.

5. A mooring buoy having a relatively flat profile including a pneumatic tire having a valve stem at its inner margin and a buoyant non-corrosive sheet metal watertight hollow drum carrying said tire in assembly thereon, the valve stem projecting into said drum, the drum having a removable cover on one of its axially opposite sides permitting access to be gained to the interior of the drum for operating the valve stem to inflate the tire.

References Cited in the file of this patent

UNITED STATES PATENTS

1,209,181	Lofland	Dec. 19, 1916
2,771,617	Brackx	Nov. 27, 1956
2,814,055	Phillips	Nov. 26, 1957