J. W. STOKER.

BALANCING DEVICE.

APPLICATION FILED JULY 15, 1911.

1,021,276.

Patented Mar. 26, 1912.

2 SHEETS—SHEET 1.

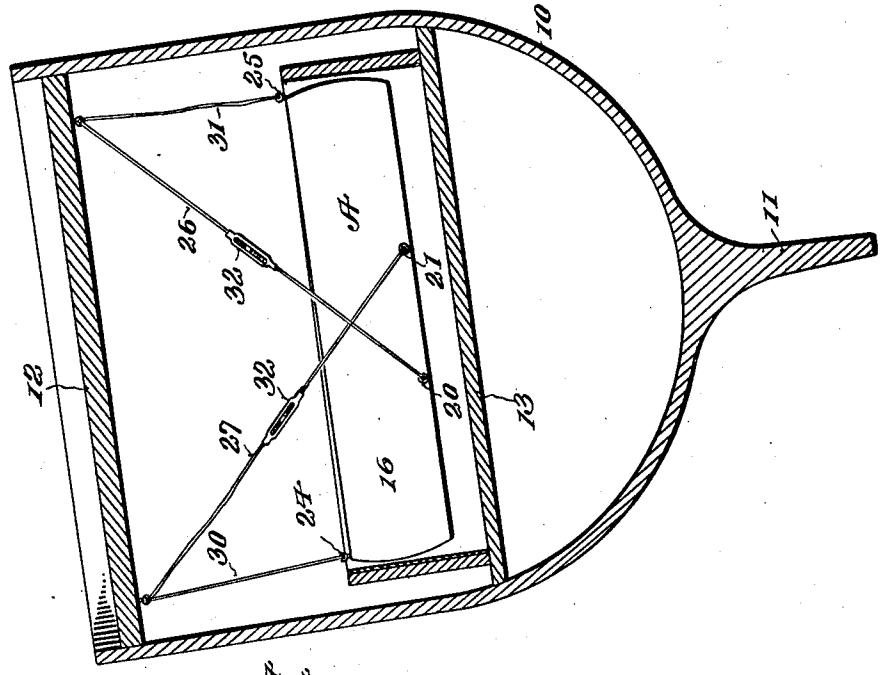


Fig. 2.

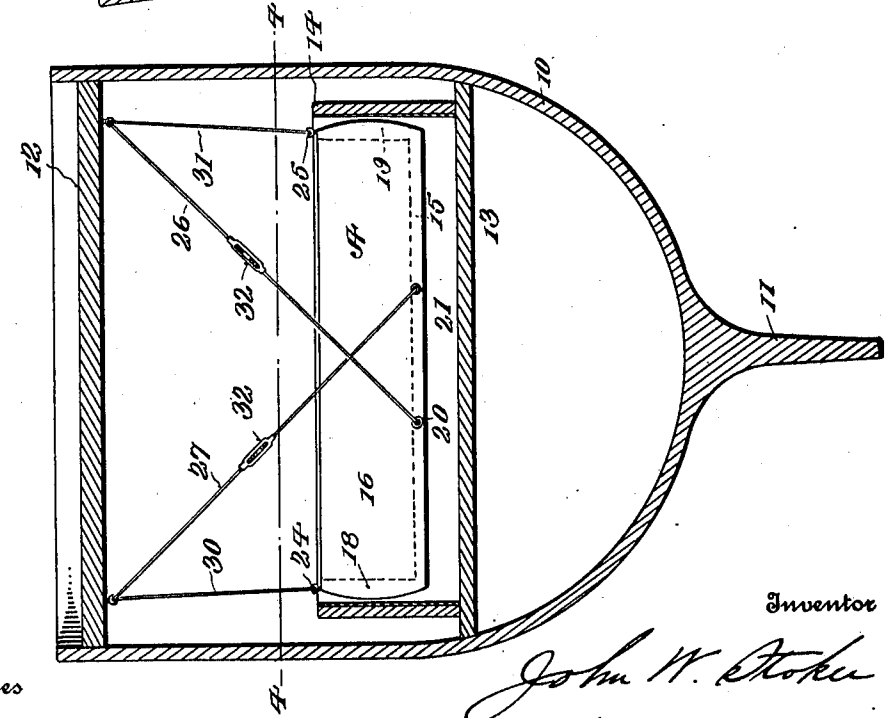


Fig. 1.

Witnesses

L. F. Brock

Inventor

John W. Stoker

By Geo. H. Snyder

Attorney

J. W. STOKER.

BALANCING DEVICE.

APPLICATION FILED JULY 15, 1911.

1,021,276. Patented Mar. 26, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

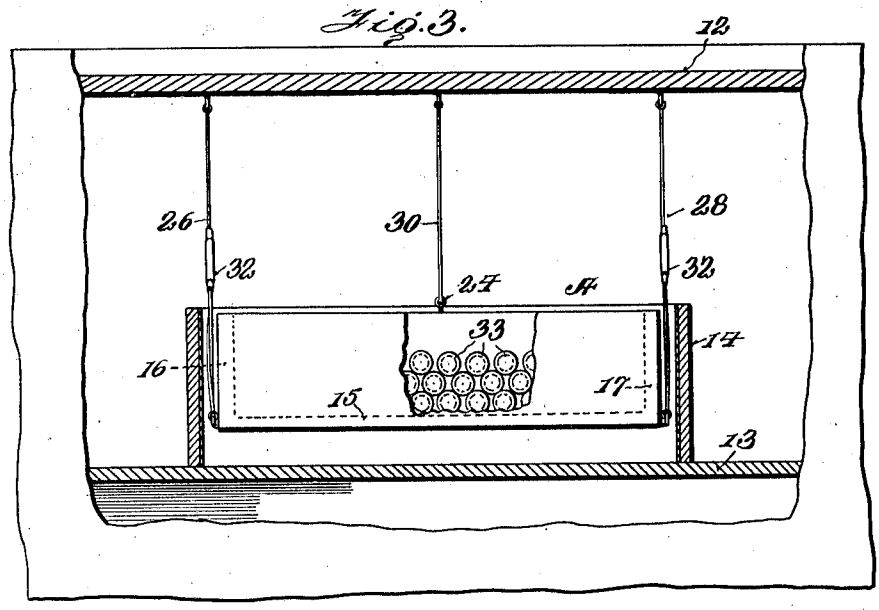


Fig. 4.

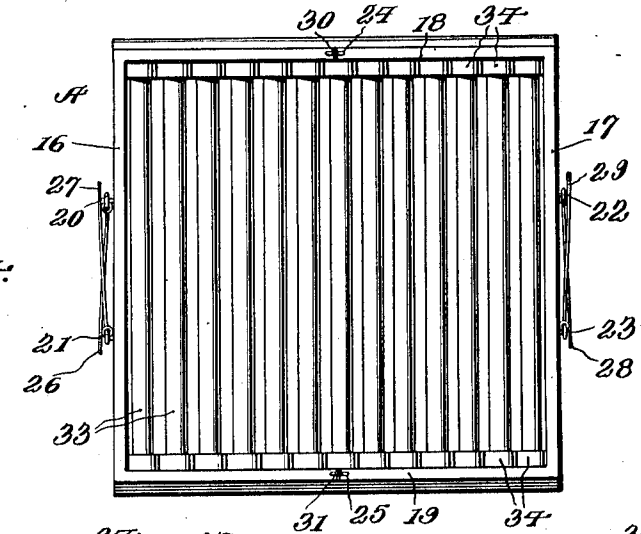


Fig. 5.

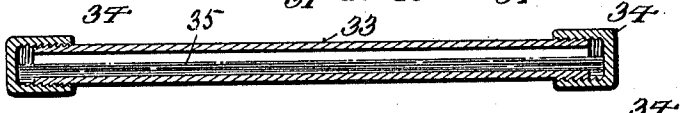
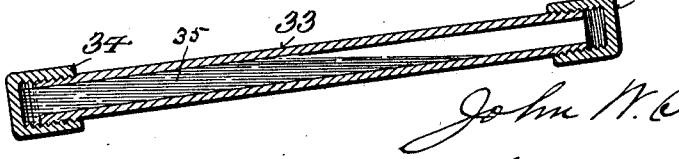


Fig. 6.



Witnesses

L. F. Brock

Inventor

John W. Stoker

By Geo. H. Snyder

Attorney

UNITED STATES PATENT OFFICE.

JOHN W. STOKER, OF MARION, INDIANA.

BALANCING DEVICE.

1,021,276. Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed July 15, 1911. Serial No. 638,717.

To all whom it may concern:

Be it known that I, JOHN W. STOKER, a citizen of the United States, residing at Marion, in the county of Grant and State of Indiana, have invented certain new and useful Improvements in Balancing Devices, of which the following is a specification.

This invention relates to balancing devices.

The object of the invention resides in the provision of a device of the character named adapted to be associated with a lateral tiltable body such as a ship or an aeroplane and when so associated will serve to resist any tendency of said body to tilt laterally and to maintain the body in a state of equilibrium.

With the above and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully described and particularly pointed out in the appended claim.

In describing the invention in detail reference will be had to the accompanying drawings wherein like characters of reference denote corresponding parts in the several views, and in which—

Figure 1 is a transverse section through a yacht or ship showing the balancing device associated therewith and the ship or yacht in the position it would occupy when in a state of equilibrium; Fig. 2, a view similar to Fig. 1 showing the position of the balancing device when the ship or yacht is tilted laterally in one direction; Fig. 3, a side view of a fragment of a ship or yacht showing the balancing device, a portion of the retaining frame of the tray of the latter being broken away; Fig. 4, an enlarged section on the line 4—4 of Fig. 1; Fig. 5, an enlarged longitudinal section of one of the fluid-carrying tubes of the balancing device showing the position of the fluid therein when the body with which the device is associated is in a state of equilibrium; and Fig. 6, a view similar to Fig. 5 showing the position of the fluid in one of the fluid-carrying tubes of the device when the body with which the device is associated is tilted laterally in one direction.

Referring to the drawings 10 indicates the hull of a ship or yacht provided with the usual keel 11 and deck 12. Constructed in the hold of the ship 10 near its bottom is a platform 13 extending transversely of the ship. Mounted upon this platform symmetrical with the ship is a rectangular frame 14 the long axis of which extends transversely of the ship, while its short axis is disposed longitudinally thereof. Supported within the frame 14 in spaced relation to the platform 13 is a rectangular tray A which includes a bottom 15, side members 16 and 17, and end members 18 and 19. This tray A is of a size slightly less than the interior dimensions of the frame 14 so that the former may partake of limited movements relatively to the frame during the tilting of the ship to one side or the other.

Mounted on the lower side of the side member 16 of the tray at equal distances on opposite sides of the short axis of the latter are eye members 20 and 21 respectively, while eye members 22 and 23 are correspondingly mounted on the lower side of the side member 17. Another eye member 24 is mounted centrally on the upper edge of the end member 18 of the tray while still another eye member 25 is mounted centrally on the upper edge of the end member 19 of the tray.

The tray A is supported in spaced relation to the platform 13 by means of cables 26, 27, 28 and 29, which have their lower ends secured respectively to the eye members 20, 21, 22 and 23. The cables 26 and 27 are extended across each other in an upwardly direction and have their upper ends suitably anchored to the lower side of the deck 12. By this arrangement of the cables 26 and 27 it will be apparent that the upper and lower ends of the cable 26 are secured on opposite sides of the longitudinal axis of the ship, while the same condition applies to the cable 27. Likewise the cables 28 and 29 are extended upwardly across each other and have their upper ends suitably anchored to the lower side of the deck 12 on the opposite side of the longitudinal axis of the ship from their lower ends. These cables are so positioned and arranged that when the ship 10 is in a state of equilibrium they bear equally the weight of the tray A and the contents thereof to be hereinafter referred to.

Secured to the eye member 24 is the lower end of a cable 30 which is directed upwardly and has its upper end secured to the deck 12 on the same side of the ship as the end 18 of the tray. Another cable 31 has its

lower end secured in the eye member 25 and is then carried upwardly and has its upper end secured to the deck 12 on the same side of the ship as the end 19 of the tray. The cables 26, 27, 28 and 29 are all provided intermediately with turnbuckles 32 whereby said cables may be lengthened and shortened and the tray A adjusted so as to hang in a state of equilibrium when the body with which it is associated is also disposed in a state of equilibrium.

Supported within the tray A is a plurality of cylindrical casings 33 which are preferably constructed of tubular members having their ends closed by caps 34. These casings are partially filled with a suitable fluid 35 so that when the tray A is in a state of equilibrium the fluid in each casing will have the same depth throughout the entire length of the casing and the weight of the fluid will be evenly distributed over the tray and upon the cables 26, 27, 28 and 29. It will be here noted that when the weight of the tray A and its contents is evenly distributed upon the cables 26, 27, 28 and 29, such weight will also be equally distributed upon opposite sides of the longitudinal axis of the ship.

The operation of the device is as follows: Assuming the ship and balancing device to be in a state of equilibrium as illustrated in Fig. 1, then the weight of said balancing device is equally distributed on opposite sides of the longitudinal axis of the ship. As soon, however, as the ship tilts laterally a little as shown in Fig. 2, the end of the tray A on the high side of the ship will also become slightly elevated with the result that the fluid in the casings 33 will flow into the ends of the casings on the low side of the ship and thus transfer substantially the entire weight of the tray and its contents to the cables 26 and 28 which, as will be apparent, are attached at their upper ends to the high side of the deck 12. The shifting of the weight of the tray and its contents, as just described, will of course resist further tilting of the ship in the same direction and tend to restore same at once to a state of equilibrium. Should the lateral tilting of the ship be in a direction opposite to that illustrated in Fig. 2 then the operation of the balancing device will be the reverse of that just described, the weight of the tray and the contents being shifted upon the cables 27 and 29.

While the device has been shown and described as applied to a yacht or ship it will be apparent that it can be associated with equal facility with any laterally tilting body which must essentially be maintained in a state of equilibrium, and it will be equally apparent that various changes in the details of construction of the device may be resorted to without departing from the spirit of the invention.

What is claimed is:

The combination with a lateral tiltable body, of a carrier, casings supported by said carrier and having their longitudinal axes disposed transversely of the tiltable body, each of which has stored therein a predetermined quantity of fluid, connections supporting said carrier and its contents normally in equilibrium from said body, said connections having their upper and lower ends secured to the body and carrier respectively on opposite sides of the longitudinal axis of the body, whereby the lateral tilting of said body will shift the preponderance of weight of the fluid in the casings upon the connections attached to the high side of the tiltable body.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. STOKER

Witnesses:
JAMES H. DOYLE,
JOS. A. TAYLOR.