Jan. 7, 1936. J. L. STRIGHT 2,026,919

COMPASS

Filed March 27, 1934 2 Sheets-Sheet 1

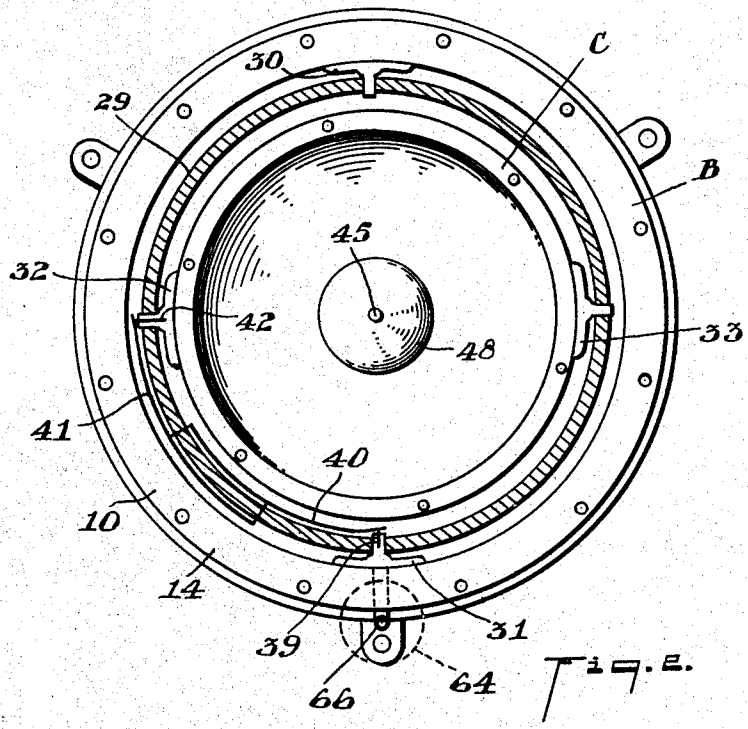


Fig. 2.

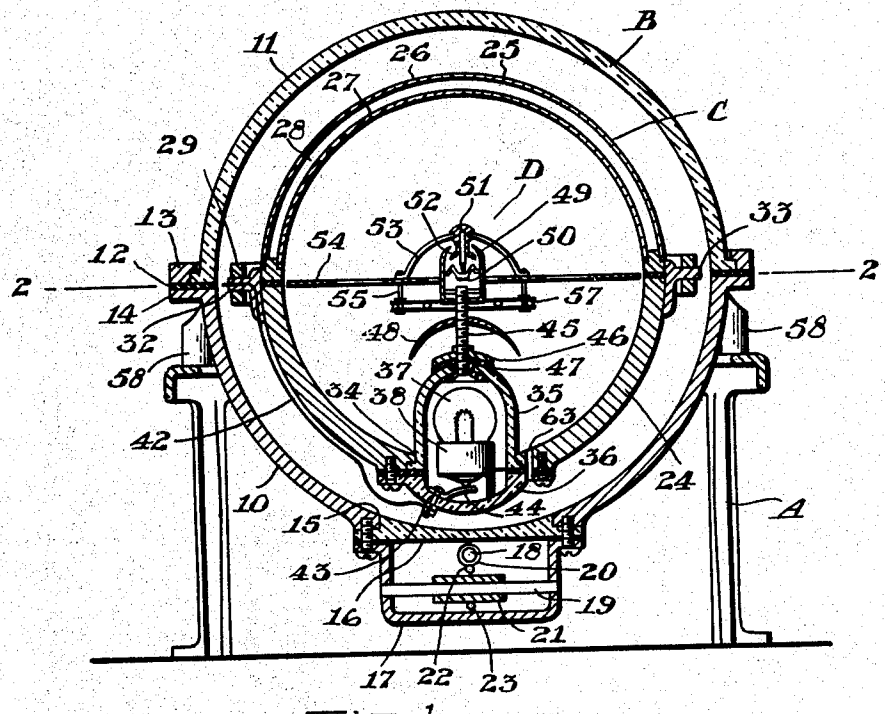


Fig. 1.

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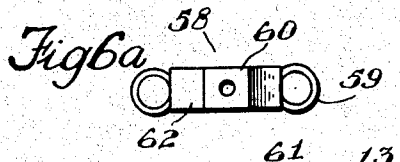
BY Henry, Barber & McKee,
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COMPASS

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Fig6a



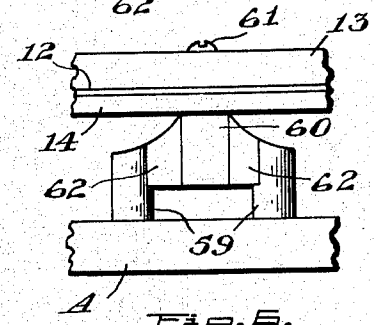


Fig. 6.

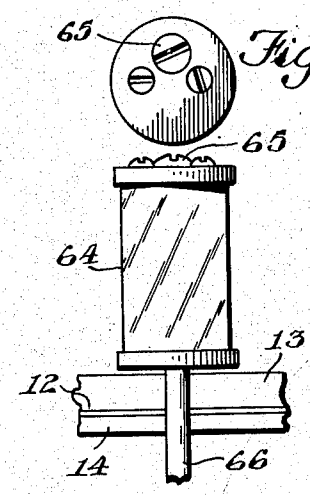


Fig. 5.

Fig. 5a.

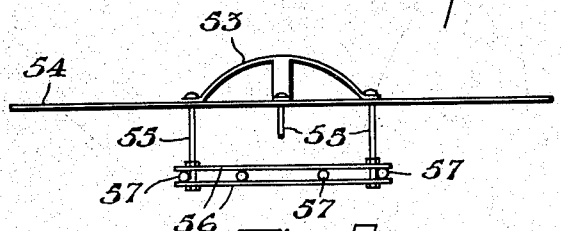


Fig. 4.

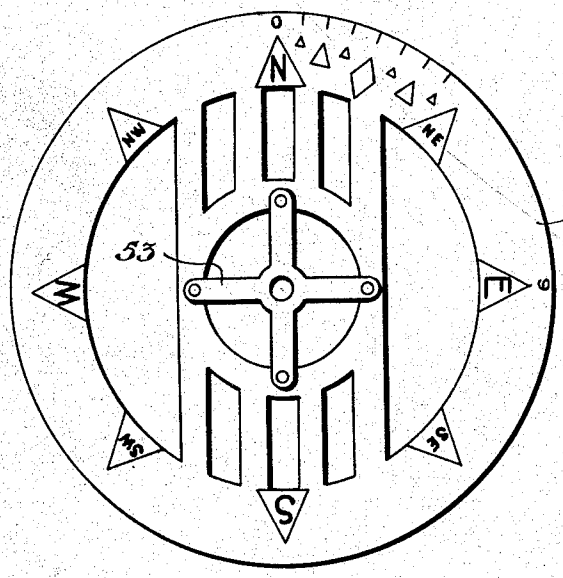


Fig. 3.

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Patented Jan. 7, 1936 2,026,919

UNITED STATES PATENT OFFICE

2,026,919

COMPASS

James Leslie Stright, Summerside, Prince Edward Island, Canada

Application March 27, 1934, Serial No. 717,645
In Canada March 29, 1933

3 Claims. (Cl. 33—223)

This invention relates to compasses and more particularly to that type familiarly known as marine compasses.

In many compasses of the typical gimbal hung type, a short cross in a rough pitching sea, sets the compass into erratic motion with the result that so long as such condition prevails great danger exists since a definite and true course cannot be held.

With the present invention, experience has shown, that my improved compass, due to its construction and arrangement, is not subject to erratic motion even though the vessel may be rolling and tossing in a rough sea.

One of the objects of the present invention therefore is to provide a compass of this character which will maintain a stable position and give accurate readings in rough seas.

Another object of the invention is to provide a compass of this character with improved gravitational balance.

A further object of the invention is to provide a compass of this character wherein means are provided to take care of the expansion and contraction of the liquid in which the elements are submerged.

Still a further object of the present invention is to provide a compass of this type composed of relatively few elements and wherein the various parts will the more effectively perform the functions required of them.

With the foregoing and other objects in view which will become apparant as the description proceeds, the invention consists essentially in the novel combination and arrangement of parts hereinafter described in detail and illustrated in the accompanying drawings in which;

Fig. 1 is a sectional elevation taken through the centre of my improved compass.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the compass card, the markings being only partly shown thereon.

Fig. 4 is a side elevation of Fig. 3.

Figs. 5 and 5a is an elevation and plan view respectively of the pressure chamber, and

Figs. 6 and 6a is an elevation and plan view respectively of the mounting between the supporting frame and the compass bowl.

Referring now to the details of structure illustrated in the drawings wherein like letters and numerals of reference indicate corresponding parts in the various views, A designates a support frame or stand upon which the compass as a whole is mounted while B indicates an outer case, C an inner case and D the card and magnet as a whole.

In general, the outer casing B is composed of lower and upper sections 10 and 11 respectively, the former being of metal and the latter being of glass or other light, transparent material. These sections, as illustrated in Figs. 1 and 6 have a gasket 12 interposed therebetween and are secured together by means of bolts, later described, which extend through the ring 13 and the flange 14 of the section 10.

At the base of section 10 I provide an opening 15 which is closed by a transparent member 16 which forms a light port at the base of the section. Immediately below the member 16 is a compensator case 17 within which are bars 18 and 19 having mounted thereon steel magnet sleeves 20 and 21 which are adjustable through adjusting screws 22 and 23. The magnets in this instance are provided for correcting the compass reading and compensating when artificial or other magnetic influence causes deflection.

Sections 10 and 11, when joined, provide a spherical housing and have mounted therewithin the inner case C. This inner case is also composed of lower and upper sections indicated by the numerals 24 and 25. The lower section is preferably of metal while the upper section comprises two domes of transparent material 26 and 27 which form an air or evacuated space 28 therebetween.

The formation of the air space in the upper section of the inner casing renders the inner casing as a whole lighter and more buoyant and when combined with the heavier, metallic, lower section accelerates responsive movement of the casing to gravitational influence.

The mounting of the case C is effected through gimbal ring 29 which is supported by gimbals or trunnions 30 and 31 connected to the casing 10 and by gimbals or trunnions 32 and 33 mounted on the sections 24. With this particular type of mounting it is apparent that notwithstanding change of position of the outer frame with respect to the horizontal, the member C with instrumentalities therein will maintain a level position.

From the description thus far given it will be seen that the gimbal mounting in combination with the arrangement of the weight of the sections, previously mentioned, lend free action to the natural gravitational pull exerted and thereby enables the case and compass card therewithin to maintain a level, stable position at all times even though the vessel be constantly rolling and pitching in rough seas.

Reverting again to Fig. 1 it will be observed that the base of section 24 is provided with an opening 34 which is closed by a transparent hood and cap 35 and 36 respectively. The hood and cap are designed to house and support light means which may conveniently take the form of a light bulb 37 in turn supported by socket 38.

Energy for the bulb 37 is preferably conducted

through a single wire system which comprises terminal 39, extending through gimbal 31, insulated conductors 40, 41 and 42, the latter connecting with terminal 43 which in turn communicates with contact 44 connecting the light bulb. Energy from a suitable source is communicated to terminal 39.

Support means for the compass card comprises a spindle screw or pin 45 mounted in the head of the hood 35 and secured therein by means of nut 46, the aperture between these elements being sealed by packing or a gasket 47. Positioned above the hood is an adjustable reflector 48 while immediately above the reflector the compass card proper is mounted.

The mounting and component parts of the compass include a jewel cup 49 adjustably supported on the spindle screw 45. Within the jewel cup I provide a jewel 50 upon which the pivot or crown pin 51 is mounted. The pivot pin is provided with locking chucks 52 and is carried by the spider 53 which in turn carries the compass card 54. The locking chucks 52 are designed to prevent the pivot from becoming displaced or disconnected from the jewel cup should the compass be inverted.

The compass card, as will be seen by reference to Fig. 3 is of the open type, light in weight, and preferably transparent. The various markings or indicia thereon, which are too well known to require description, are opaque, thus they contrast with the light rays and cause the markings to become clearly legible. Having regard to the foregoing it will be evident that I have provided a compass card light in weight which reduces over swing to a minimum and at the same time renders the markings more clearly visible.

In addition to acting as a support means for the compass card, the spider also supports compass magnets. The suspension means for the magnets includes rods 55, rings 56 and the magnets themselves which are identified by numeral 57.

A zero or other relative marking may be inscribed on the inner wall or surface of the case C.

The mounting of the case B, previously mentioned and now referred to in detail is designed to damp vibration or shock which would normally be transmitted to the compass. This structure embodies a series of connectors 58 composed of legs 59 supported on the stand or frame A and core 60 connected by screw or other suitable means 61 to the outer case and ring 13. The intermediary sections 62 of the connectors possess flexibility and may be defined as rubber or like substance.

Under normal operation both the outer and inner case are filled with a liquid and communication is established therebetween by means of a series of orifices 63. (See Fig. 1.) By such provision an equalized pressure is maintained on both sides of the inner case notwithstanding contraction or expansion which may occur.

In addition to the establishment of a balance for the case C I provide means for maintaining a constant supply of liquid. This means comprises a chamber 64 conveniently transparent, filled approximately one quarter with liquid and three quarters with air. With this particular arrangement any expansion or contraction in the liquid is taken care of and the case is constantly filled to capacity. A plug 65 is provided in the chamber for filling purposes should such become necessary while the chamber is connected to the case B by means of conduit 66.

From the foregoing it will be seen that I have developed a marine compass, simple and novel in structure, which responds readily to changed conditions, balances quickly and evenly due to structural qualities and arrangement and maintains a constant supply of liquid in the case.

Many changes may be made in the above and many apparently different embodiments constructed without departing from the spirit or scope thereof. It is intended therefore that all matter contained herein shall be interpreted as illustrative rather than in a limitative sense.

What I claim as my invention is:

1. In a marine compass, the combination of an outer casing formed with a transparent top and filled with a liquid, an inner casing formed with spaced transparent top members providing an air space therebetween and rendering the inner casing more buoyant, the said inner casing being gimbal hung in spaced relation to the outer casing and formed with orifices adapted to establish communication between the casings, a compass card in the inner casing, a jewel cup supported by the inner casing providing a pivot mounting for the card, magnetic means associated with the card, adjustable compensating magnets associated with the outer casing and reservoir means for maintaining a supply of liquid in the casings.

2. In a marine compass, an outer casing formed with a transparent top section and a relatively heavy bottom section, an inner casing gimbal hung within the outer casing and formed with a transparent top section and a relatively heavy bottom section, the said transparent top section of the inner casing being formed with an air space to render the said casing more buoyant and responsive to gravitational influence, a housing carried by the inner casing, a jewel cup supported by the housing, a compass card carried by the jewel cup, a light within the housing and a light deflecting member mounted between the said jewel cup and the said housing adapted to direct rays from the said light to the outer periphery of the compass card.

3. In a marine compass, the combination of an outer casing formed with a transparent top and filled with a liquid, an inner casing within and gimbal hung in spaced relation to the outer casing and formed with a relatively light, transparent top and a relatively heavy bottom, the said inner casing being formed with liquid communicating passageways permitting passage of liquid between the outer and inner casings, illuminating means in said inner casing, hood means sealing the illuminating means from the liquid, a compass card, a jewel cup supported by and within the inner casing, the said jewel cup pivotally supporting the said compass card, means for vertically adjusting the jewel cup, magnetic means associated with the compass card, compensating magnets associated with the outer casing and reservoir means exteriorly of the casings having communication with the outer casing for maintaining a supply of liquid in the said casings.

JAMES LESLIE STRIGHT.