April 22 , 1924. 1,491,593

E. B. ERIKSEN

COMPASS

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Fig. 1,

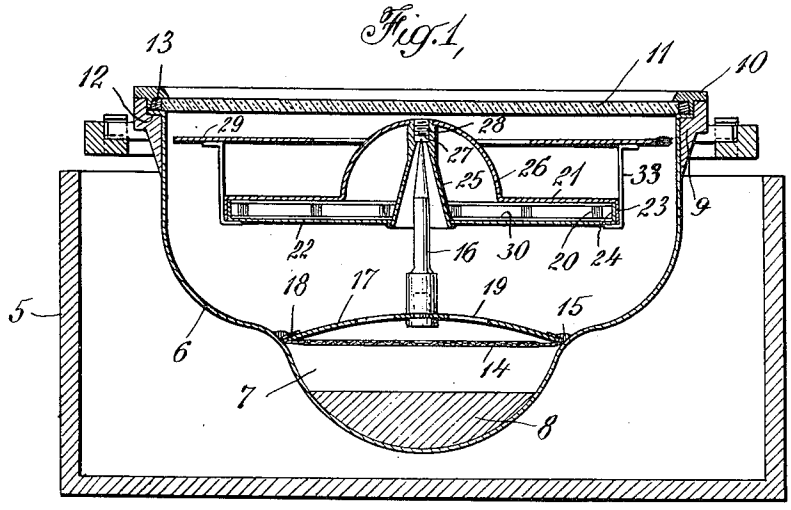
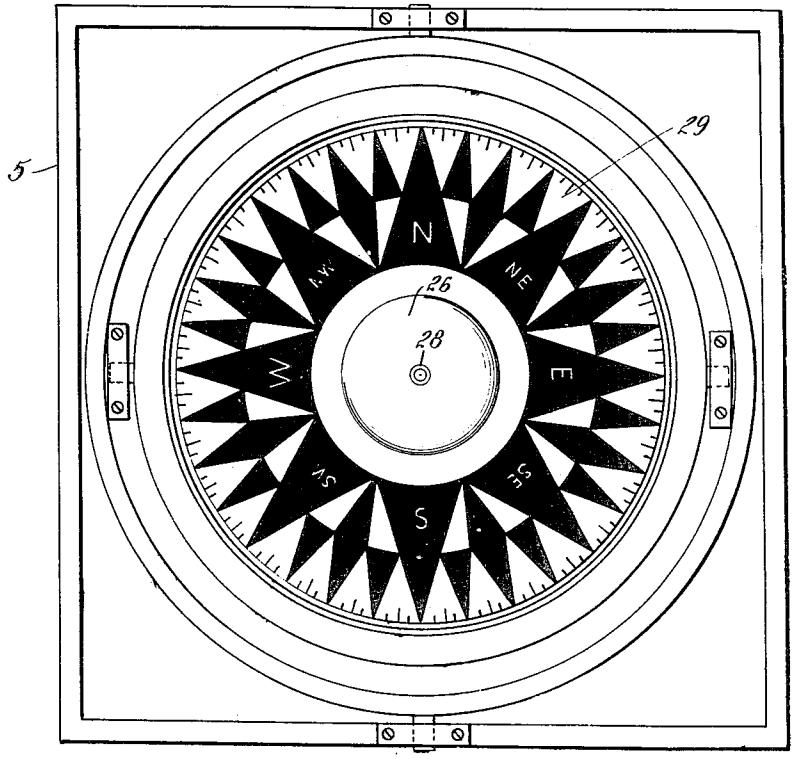


Fig. 2,



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Fig. 3,

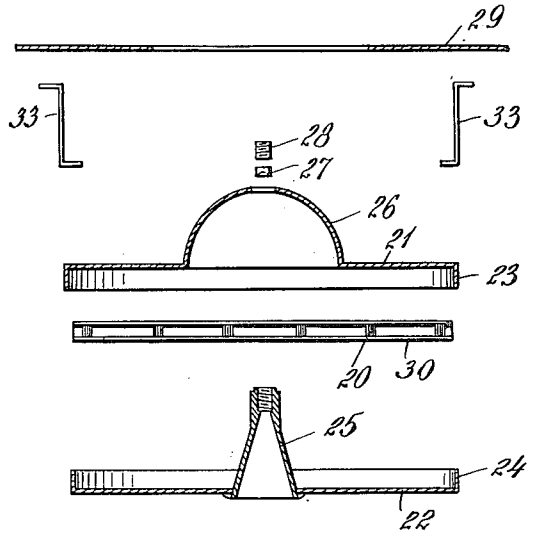


Fig. 4,

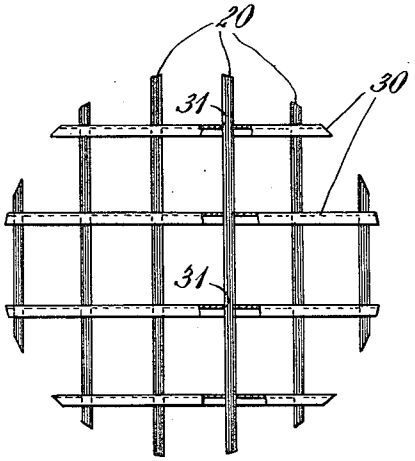
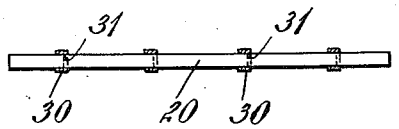


Fig. 5,



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Patented Apr. 22, 1924. 1,491,593

UNITED STATES PATENT OFFICE.

EINAR B. ERIKSEN, OF BROOKLYN, NEW YORK, ASSIGNOR TO ERNEST W. MARSHALL, OF YONKERS, NEW YORK.

COMPASS.

Application filed September 24, 1919. Serial No. 326,007.

To all whom it may concern:

Be it known that I, EINAR B. ERIKSEN, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Compasses, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My present invention relates particularly to compasses of the nautical type and the objects of the invention are to simplify and improve the construction particularly as regards the compensating mechanism and the structure of the magnetic element.

A special feature of the invention is a compensating mechanism in the form of a substantially flat diaphragm sealed over a compensating pocket or chamber in the bowl of the compass and flexible to opposite sides of the general flat plane of the diaphragm. The magnetic element is pivoted independently of this diaphragm on a base which may be secured to the compass bowl at the same point where the diaphragm is secured thereto.

This magnetic element comprises in the preferred construction a hollow casing presenting smooth friction reducing surfaces to the liquid within the bowl and containing a series of magnet bars secured in substantially parallel spaced relation.

Other features of the invention will appear as the specification proceeds.

In the accompanying drawings I have illustrated a practical and preferred embodiment of the invention, but would have it understood that modifications may be made without departure from the true spirit and scope of the invention as defined in the appended claims.

In these drawings, Figure 1 is a vertical sectional view through the central portion of the compass.

Figure 2 is a plan view of the compass.

Figure 3 is a detail sectional view, illustrating the separated portions of the magnetic element.

Figure 4 is a plan view of the magnet assembly.

Figure 5 is an edge or bell section of the magnet assembly as looking towards the right-hand side of Figure 4.

Like characters refer to corresponding parts throughout the several views.

5 designates a box or housing for the bowl 6 of a compass which in accordance with my invention is preferably constructed in a single piece, for instance, of spun brass and formed with an integral pocket or depression 7 in the bottom thereof to provide a holder for the lead or weight material 8 and a so-called compensating chamber. At the upper rim portion I have shown this bowl reinforced with a heavy annular section 9, which may be of cast metal and to which may be secured the annulus 10, which seals the cover plate 11 in position. A simple method of securing these parts is to provide the spun portion of the bowl with an annularly outstanding flange 12 overlying and soldered to the upper face of the reinforcing rim 9. One or more packing gaskets 13 may be interposed at this point over the cover, so as to prevent any leakage.

14 designates the compensating diaphragm, of generally flat shape, which may be corrugated, as indicated, to render it more flexible. This diaphragm is secured over the compensating pocket in any suitable way, for instance, by having its rim soldered to the bottom of the bowl, as indicated at 15.

The magnetic element is mounted on a pivot post 16 which is carried in this instance by base plate 17 of generally arched shape overstanding the diaphragm and secured in place by having its rim portion secured over the rim portion of the diaphragm, as indicated at 18. In practice the diaphragm may have its edge flanged and turned over the edge of the base plate 17, as shown. By means of this arrangement both the base for the pivot post and the diaphragm may be secured in place by a single soldering operation.

The bowl above the diaphragm contains a suitable liquid for giving flotation to the magnetic element or compass card, as will be readily understood and the pivot post base is perforated or provided with openings as at 19 to admit the liquid to the diaphragm.

From the construction thus far disclosed, it will be apparent that the flexible diaphragm while normally substantially flat is free to flex in either direction in accordance with the varying pressures exerted thereon and it therefore freely responds to the expansion or contraction of the liquid within

the bowl, the body of air or gas below the diaphragm acting to cushion such movements of the diaphragm.

The magnetic element consists in the present preferred construction of a plurality of magnet bars 20 of graduated length arranged in spaced parallel relation within a float or casing of disk shape and made up of upper and lower disk members 21 and 22, connected at their edges by the overlapping flanges 23 and 24. The lower disk member is furthermore shown as carrying a central tubular projection or thimble 25 of substantially conical shape. The upper disk member serves as a cover and is shown provided with a dome-shaped central portion 26 preferably arranged to meet the top of the tubular projection 25. Within the upper end of the tubular portion is a bearing which coacts with the first post to support the magnetic element. This bearing is shown as a jewel 27, held in place by an adjustable screw 28 seated in the screw threaded upper end of the tubular connecting member 25.

The thimble or projection 25 is shown as a separate conically shaped element having its base secured to the under portion of the lower disk 22 and its upper end secured to the dome 26 of the upper disk. The compass card or dial 29 is provided with a central opening to permit the entry of the dome 26 and is supported in close proximity to the glass cover by means of brackets 33 rising from the float. These brackets are of sufficient height to support the dial in line with the pivot on which the float is balanced. This arrangement of the compass card is an important feature of my invention.

The magnet bars 20 are secured in the casing in parallel spaced relation, according to the present disclosure, by means of channel strips 30, said strips being disposed in parallel relation within the casing and having registering openings 31 in the backs or bottoms of the channels to receive the magnet bars. When the bars are passed through these openings, the top and bottom flanges of the strips, which are disposed on edge, overlie the upper and lower edges of the magnet bars so that the whole forms a grid, as indicated in Figure 4, in which the bars and strips respectively stand in substantially parallel relation.

The construction disclosed provides a magnet assembly having strong magnetic properties and this element swings freely within the compass bowl by reason of the fact that the magnet bars are all encased within a cover which presents a smooth and unobstructed surface to the compass liquid.

The compass movements therefore are not retarded and the action of the parts is substantially frictionless, this partly due also to the floating effect of the casing which takes a good deal of the weight off the pivot post.

What I claim is:

1. In a compass, the combination with the bowl thereof, of a stepped ring surrounding the rim of the bowl, a flange projecting laterally from the bowl rim and seated on the step, a transparent cover seated on the flange, and means providing a seal between the flange and cover.

2. A magnetic element for compasses comprising a disk member having an upstanding flange at the rim thereof and an upstanding tubular projection at the center thereof, a second disk member having a dependent annular flange for engagement with the flange of the first disk member and a dome-shaped central portion for engagement with the tubular projection of the first member, a pivot bearing seated in the tubular projection and one or more magnet bars secured between the two disk members.

3. A compass comprising a bowl provided with a compensating pocket, a base plate, a flexible diaphragm covering the compensating pocket and having its rim portion flanged over the edge of the base plate, said flange portion of the diaphragm being secured by solder or the like to the bowl to thereby seal the diaphragm over the compensating pocket and secure the base plate in fixed position, a post carried by the base plate and a compass element supported on said post.

In witness whereof I hereunto set my hand this 12th day of September, 1919.

EINAR B. ERIKSEN.