E. S. RITCHIE.

Mariners' Compass.

No. 166,812. Patented Aug. 17, 1875.

Fig. 1.

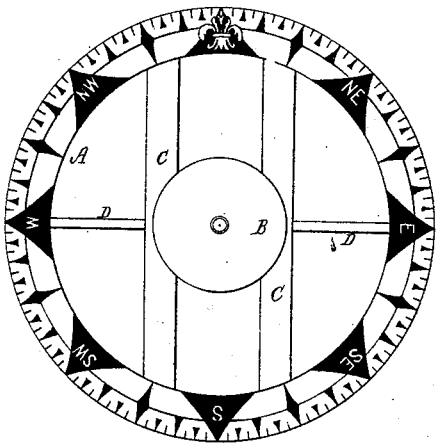
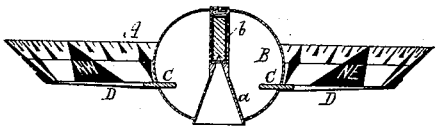


Fig. 2.



Witnesses
S. U. Pipes
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UNITED STATES PATENT OFFICE.

EDWARD S. RITCHIE, OF BROOKLINE, MASSACHUSETTS.

IMPROVEMENT IN MARINERS' COMPASSES.

Specification forming part of Letters Patent No. **166,812**, dated August 17, 1875; application filed July 20, 1875.

To all whom it may concern:

Be it known that I, EDWARD S. RITCHIE, of Brookline, of the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Cards for Mariners' Liquid Compasses; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a top view, and Fig. 2 a transverse section, of one of my improved compass-cards.

This card consists of a perforated disk or divided ring, A, a concentric spheroidal or ball-shaped or concentrated buoyant vessel, B, and two or any other suitable number of magnets, C C, or such and two or any other proper number of arms, D D.

The vessel B is arranged at the center of the perforated disk or ring A, and, as represented in the drawings, the magnets C C extend across the ring and through the air-vessel, which projects both above and below them, the said magnets being flat and straight steel bars, though I do not confine my invention to such forms of them. The divided ring is fastened to the magnets, and also to two arms, D D, extended from said magnets, as represented.

It will be observed that around the buoyant vessel, and between it and the divided ring, are openings for the liquid of the compass-bowl to flow freely through the card.

A disk perforated with holes for the passage of the liquid through it may be substituted for the annulus A.

The air-vessel has within it, as shown, a hollow cone, *a*, open at its lower end, and provided with the pivot-bearing *b*.

By having the divided ring concentric with the buoyant ball shaped air-vessel, circular in its horizontal section, and spheroidal, or approximately so, in form, as shown in the drawings, or otherwise properly shaped in its vertical section, the buoyant power becomes concentrated, and arranged equally about the central vertical axis of the card.

It is important that the liquid should be able to pass freely through the card, in order to reduce the resistance, and enable the card to maintain its equilibrium and work to the best advantage.

If preferable, the needle or needles may be properly covered or incased, the cases or the needles or needle, when one only is used, serving as a means of supporting the central air-vessel, and connecting it with the divisional ring or perforated plate. The center of buoyancy of the air-vessel should be a little above the center of gravity of the card.

In carrying out my invention, I prefer to employ a ring for reception of the marks or divisions indicative of the points of compass; but, as hereinbefore stated, a flat wheel or disk, having a series of openings made through it for the free passage of the liquid, may be substituted for such ring. The ring may be flat, or it may be inclined, as shown in the drawings, so as to have the surface upon which the eye usually looks while the compass is in use perpendicular, or about so, to the line of sight.

Heretofore, in mariners' liquid-compass cards, the buoyant vessels have generally been composed of elongated cylindrical tubes, placed parallel or radially to each other.

In my present construction or use of a single concentrated buoyant vessel I lessen the inertia and resistance, and otherwise gain advantage, especially in simplicity and cheapness of construction.

I therefore claim—

An improved liquid-compass card, composed of the concentrated buoyant air-vessel, the perforated plate or divided ring A, and one or more magnets, C, or such and arms D, arranged and constructed substantially as set forth.

EDW. S. RITCHIE.

Witnesses:

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