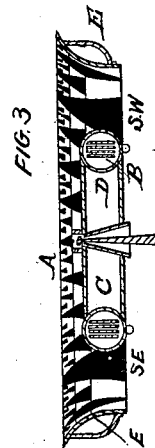
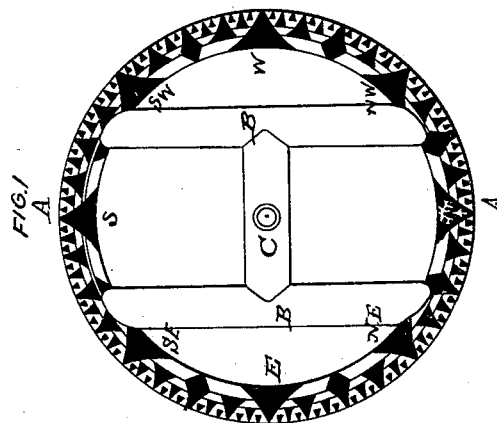
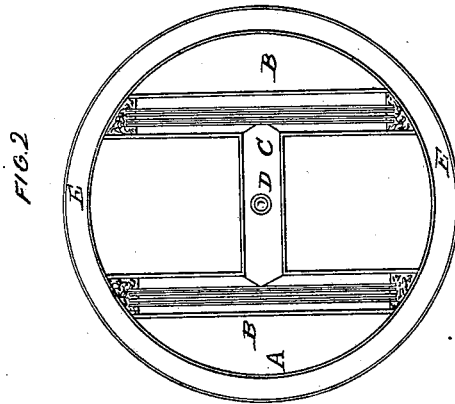


E. S. RITCHIE.  
Mariner's Compass.

No. 53,875.

Patented April 10, 1866.



WITNESSES  
J. P. Daley  
Samuel O. Raper.

INVENTOR  
Edward S. Ritchie  
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R. H. Eddy.

# UNITED STATES PATENT OFFICE.

EDWARD S. RITCHIE, OF BROOKLINE, MASSACHUSETTS.

## IMPROVEMENT IN MARINER'S COMPASS.

Specification forming part of Letters Patent No. 52,875, dated April 10, 1866.

*To all whom it may concern:*

Be it known that I, EDWARD S. RITCHIE, of Brookline, in the county of Norfolk and State of Massachusetts, have made a new and useful Invention having reference to the Buoyant Cards of what are termed "Liquid Magnetic Compasses;" and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a horizontal section, and Fig. 3 a transverse section, of a magnetic compass-card provided with my invention.

The nature of such invention consists in the combination of an annular float and one or more magnets and the encompassing case or cases thereof; also, in the combination of a divisional ring, an annular float, and one or more magnets and the encompassing case or cases thereof; also, in the arrangement of the divisional ring and the annular float so that the ring may make part of the float, as hereinafter described and as represented; also, in the combination, as well as the arrangement, of the two magnet-cases, the bearing-carrier, and the divisional ring, and the annular float; also, in the arrangement of the divisional ring—viz., so as to incline to the horizon or plane of the magnets—the same being substantially in manner as hereinafter explained, and as represented in the accompanying drawings, and for the purpose of arranging the divisions and indicatory marks of the ring so that they may be observed to better advantage generally than when the marked surface of the ring is arranged either horizontally or vertically.

By my said improvement the divisional surface of the ring is nearly perpendicular with the line of sight, which, as generally directed toward the said surface when the compass is in use on shipboard, is at an inclination with the horizon.

In the drawings, A denotes the divisional ring, which is represented as joined to two magnet-cases, B B, connected at their middles by a bearing-carrier, C. The usual pivot on which the card is supported is to pass up into the cone D and against the agate bearing.

One or more bar-magnets are arranged lengthwise in each of the cases B B, which are intended to be air-tight, for the purpose of preventing oxidation of the magnets.

The divisional ring A is represented as so inclined to the plane of the magnets, or that of the axis of the cases B B, that the longer edge of the ring shall be toward the eye of the observer, the divisions of the card being arranged on its inner surface.

Against the outer surface of the ring, and encompassing it concentrically, is a float, E, which in this case is a hollow and air-tight annulus composed in part of the divisional ring. Its purpose is to aid in giving buoyancy to the card, and to enable larger and more powerful magnets to be used in the magnet-cases than when they alone are employed to obtain the necessary buoyancy of the card.

By having two magnet-cases arranged as set forth we are enabled to use two series of magnets and gain the advantages thereof.

I claim as my invention the following—that is to say:

1. The combination of the annular float and one or more magnets and the encompassing case or cases thereof.
2. The combination of the divisional ring, the annular float, and one or more magnets and the encompassing case or cases thereof.
3. The arrangement of the divisional ring and the annular float so that the ring may make a part of the hollow float.
4. The arrangement of the divisional ring in another respect—viz., so as to incline to the plane of the magnets—the same being substantially as and for the purpose hereinbefore explained.
5. The combination, as well as the arrangement, of the two magnet-cases, the bearing-carrier, and the divisional ring, or the same and the annular float.

E. S. RITCHIE.

Witnesses:

R. H. EDDY;  
F. P. HALE, Jr.