J. A. MARDEN.
Mariner's Compass.

No. 198,132. Patented Dec. 11, 1877

Fig 1.

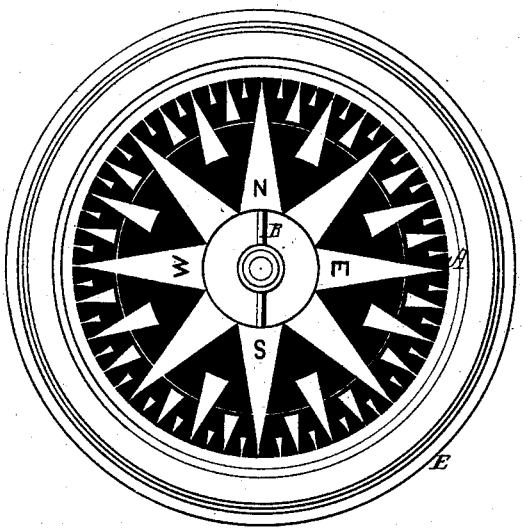


Fig 2.

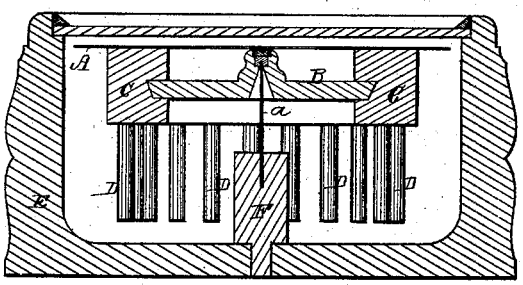


Fig 3.

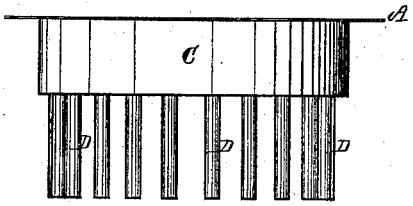
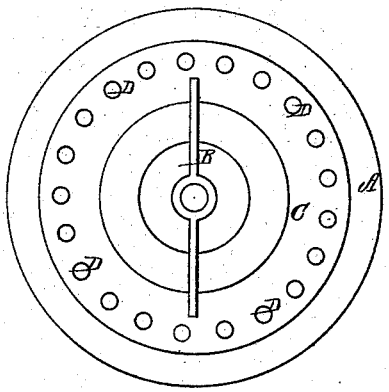


Fig 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

JEREMIAH A. MARDEN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MARINERS' COMPASSES.

Specification forming part of Letters Patent No. **198,132**, dated December 11, 1877; application filed November 20, 1877.

To all whom it may concern:

Be it known that I, JEREMIAH A. MARDEN, of Boston, of the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in the Mariner's Compass; and 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, and Fig. 2 a transverse section, of a compass provided with my invention. Fig. 3 is a side view, and Fig. 4 a bottom view, of the compass-card, magnetic needle, and their additions, as hereinafter explained.

The main purpose of my invention is to prevent the needle from being deflected from its true course by any iron or metal in its vicinity, especially when the compass is in use on shipboard.

To this end I combine with the magnetic needle, or with such and its card, a circular range or series of vertical magnets, each of which is composed of a short rod of steel hardened at and near its upper end only, such magnets being so arranged that those which may be in the quadrants flanking the south pole of the needle shall have their north poles at their upper ends, while those of the opposite quadrants, or those flanking the north pole of the needle, shall have their south poles at their upper ends.

With such a needle and series of surrounding magnets, or with them and the card, I combine a suitable float, which, as shown in the drawings, is an annulus of cork, its buoyant power being sufficient to counterbalance, or nearly counterbalance, the weight of the needle and the series of magnets, or such and the card.

In the drawings, A denotes a common compass-card, and B its magnetic needle, the latter being extended diametrically across a float, C, upon which the card is fixed concentrically. There is inserted vertically in such float a circular range or series of short rods or bar-magnets, D D D, &c., they being disposed at or about equal distances apart. Each of these magnets is to be a steel bar hardened at and near its upper end only, the rest of the bar being left in its soft or normal condition, or not hardened, in order that when magnetized its upper pole shall be magnetically stronger than the lower one. These magnets which are in the north semicircle of the needle, or which are to the north of a line going at right angles to the needle through its center, or which are beneath the north semicircle of the card, should have their south poles uppermost, the rest of the magnets having their north poles uppermost.

In consequence of this construction of magnets and arrangement of them with the magnetized needle, or such and its card, such needle will have its south pole flanked or guarded on both sides by the north poles of the semicircular range of magnets, the other pole of the magnetic needle being similarly flanked or guarded by the south poles of the remaining magnets. Therefore, should there be in the vicinity of the needle a mass or object of iron tending to attract the needle at its south pole, so as to draw it out of the magnetic meridian, the force of attraction will be counteracted by the repellent powers of the north poles of the adjacent flanking magnets; so, should the needle at its north pole be subjected to an attraction tending to deflect it from the meridian, the adjacent flanking magnets will counteract such attraction, all of which I have demonstrated in practice.

The needle, its float, and repellent magnets are to be arranged within water, or a suitable liquid, in a bowl, E, having projecting up from its bottom a post, F, carrying the pivot *a* of the needle.

The additional or repellent magnets, the needle, and the float, or such and the card, I usually cover with a varnish or substance resistive of the oxidizing powers of the said liquid.

I claim—

1. The combination of the magnetic needle and a circular range or series of magnets, constructed and having their poles arranged with those of such needle, substantially as set forth.

2. The combination of the float, the mag-

netic needle, and the circular range or series of magnets, constructed and having their poles arranged with those of such needle, substantially as set forth.

3. The combination of the compass-card, the magnetic needle, the float, and the series of magnets, constructed and having their poles arranged with those of such needle, substantially as set forth.

JEREMIAH A. MARDEN.

Witnesses:
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JOHN R. SNOW.