

C. KLINE.
Compass.

No. 16,845.

Patented March 17, 1857.

Fig. 1.

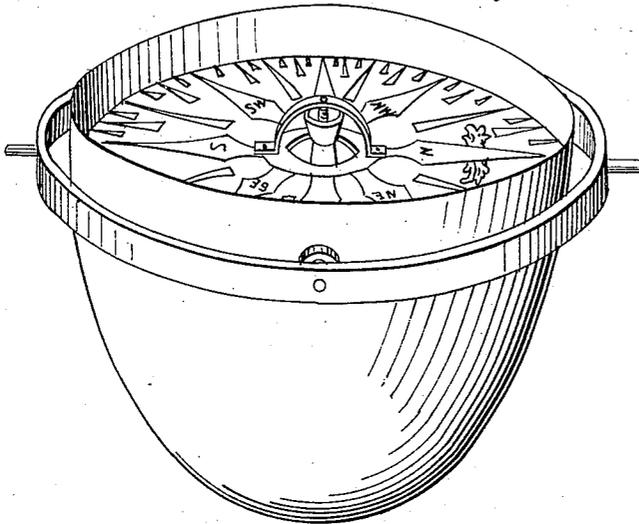


Fig. 2.

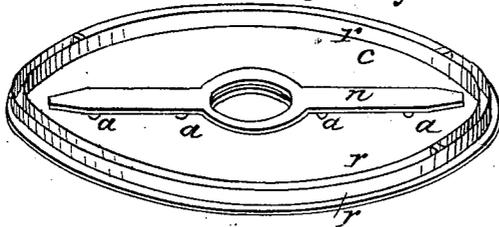
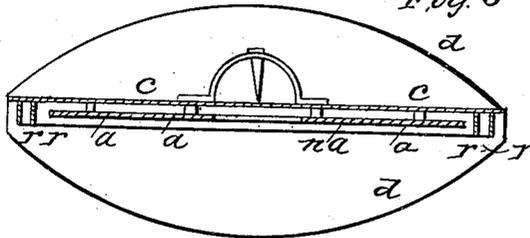


Fig. 3.



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UNITED STATES PATENT OFFICE.

CALVIN KLINE, OF NEW YORK, N. Y.

MODE OF COMPENSATING THE LOCAL ATTRACTION OF THE MAGNETIC NEEDLE ON SHIPS.

Specification forming part of Letters Patent No. 16,845, dated March 17, 1857.

To all whom it may concern:

Be it known that I, CALVIN KLINE, of the city, county, and State of New York, have invented certain new and useful Improvements in Compasses for Marine and other Purposes, by which the effect of local attraction is prevented or cut off, and the compass is made to traverse more perfectly than it has heretofore done, as hereinafter fully described and ascertained, reference being had to the accompanying drawings, in which—

Figure 1 is a general view of the compass in its most common form, the parts exhibited being in all particulars like the ordinary mariner's compass; but it may assume any form in which compasses are made. Fig. 2 is a view of the under side of the compass-card. Fig. 3 is a section vertically through the center.

My improvement consists in surrounding the compass-needle with an insulated shield of iron or steel, which I have found to protect the needle against all local attractions, while it is left to traverse freely by the natural magnetism of the earth, and it is found that with my device the compass traverses as freely and settles as quickly as the ordinary compass where no local attraction is present.

The compass may be made and hung in any of the most approved ways, that part being in no way changed by my improvements, except by the additions hereinafter named. The needle is attached to the card on which the points of compass are marked in the usual way; or it may be set off a little distance therefrom, short connections being used to unite them. This mode is represented in the section Fig. 3. *c* is the card; *n*, the needle. *a* are the connections which unite them. *r r* are the concentric rings, of iron or steel, which surround the magnet. These rings are also shown in Fig. 2. They are affixed to the card, which must be a more or less perfect non-conductor, so that the rings of iron or steel *r r* shall be insulated from the magnetic needle *n*, while they are so connected with it as to traverse with it, the

non-conductor serving to unite them, and causing them all to move together. If more than one ring *r* is used, they should be concentric and insulated from each other to produce the best effect. The rings I propose to make of broad ribbons of thin tinned iron or sheet-iron bent into a circle or such other form as shall hereinafter be found to be most effective, and the ribbon may be either attached to the card below its surface, so as to be out of sight, or it may be put around the edge of the card, a portion rising above it. The needle should be about the center of the breadth of the ring to have the best effect.

I propose, as a modification of this device and for more perfect security, to have a thin disk or convex plate above the magnet and another below, attached to the insulated ring or rings, or even a globe of metal surrounding the needle; but this would probably not be necessary in most cases. In all cases the needle must be insulated from the rings or surrounding iron.

It is obvious I can employ wire-netting instead of metal plates where that would be desirable.

In Fig. 3 the disks are shown, *c* being the card, *n* the needle, and *d* the metallic envelope.

I find that other metals may be employed with good effect, but not so perfect as soft iron. I have used zinc and copper, which I should deem the equivalents of the iron rings.

Having thus fully described my improved compass, what I claim as my invention, and desire to secure by Letters Patent, is—

The surrounding metallic ring or rings *r* or the modifications thereof, constructed, combined, and arranged with the needle of a compass substantially in the manner and for the purposes set forth.

CALVIN KLINE.

Witnesses:

J. J. GREENOUGH,
SAML. COLMAN.