

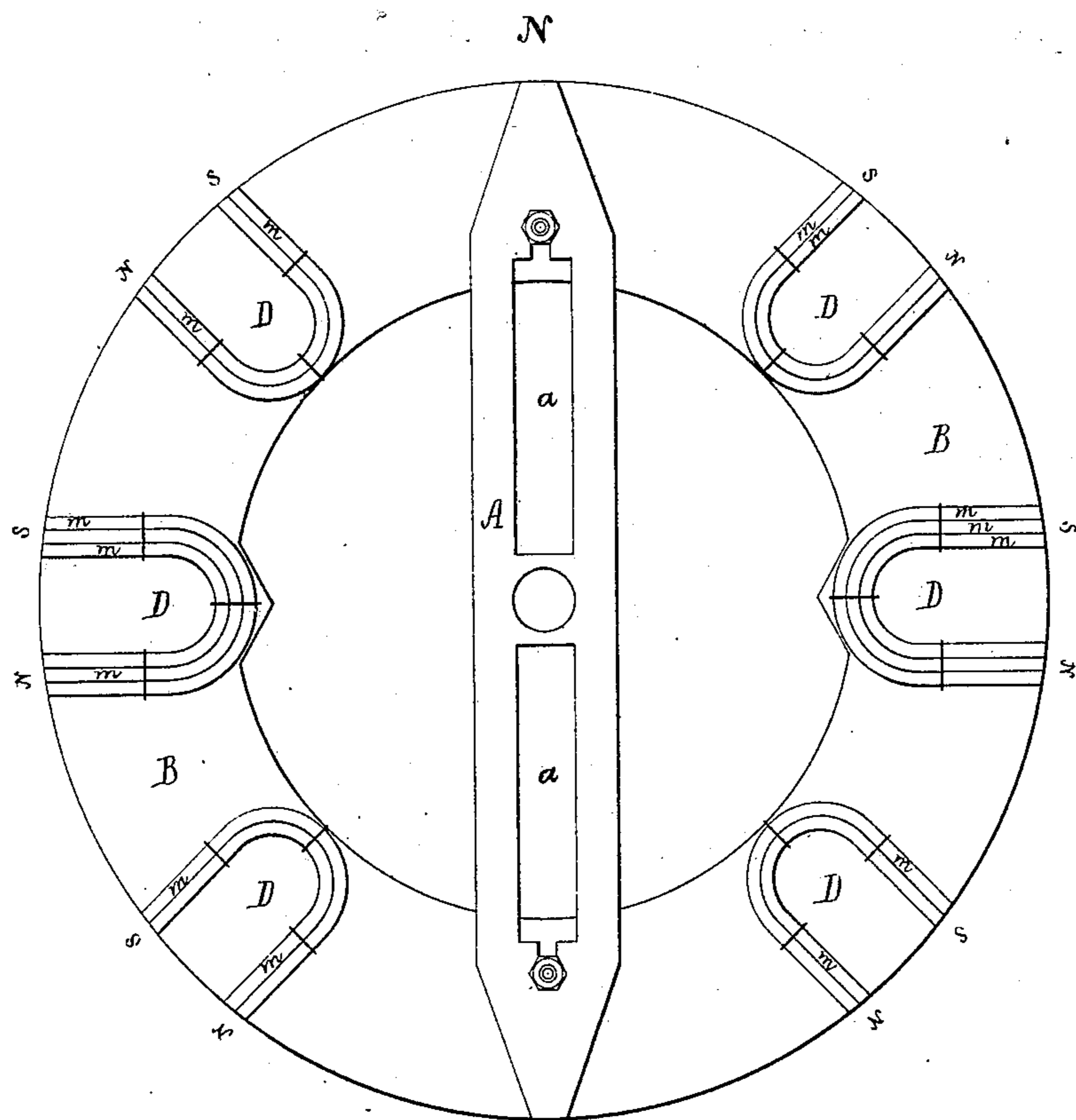
(No Model.)

J. LEWIS & F. A. BROWN.

Card and Magnetic Needle for Mariners' Compasses.

No. 238,508.

Patented March 8, 1881.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN LEWIS AND FREDERICK A. BROWN, OF BOSTON, ASSIGNORS TO
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CARD AND MAGNETIC NEEDLE FOR MARINERS' COMPASSES.

SPECIFICATION forming part of Letters Patent No. 238,508, dated March 8, 1881.

Application filed November 29, 1880. (No model.)

To all whom it may concern:

Be it known that we, JOHN LEWIS and FREDERICK AUGUSTUS BROWN, of Boston, of the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in the Cards and Magnetic Needles for Mariners' Compasses; and we do hereby declare the same to be described in the following specification and represented in the accompanying drawing, which denotes an under-side view of a compass-card with our invention applied to it.

The first part of our invention relates to the magnetic needle of such card; and it consists in making it with slots extending longitudinally in it, between its middle and ends, we having found by experiments that a needle when so made is more sensitive or quicker in action and more reliable than when without such slots.

The second part of our invention is for the purpose of preventing the needle from being affected by local attractions, or by a mass of iron when in its vicinity, and we accomplish this by combining with the needle and the card or circular plate, to which the needle is attached, a series of U-magnets, or a series of sets of U-magnets, arranged at proper distances apart with their axes in lines radiating from the center of the card, and with the north pole of each of such magnets toward the south pole of the needle, all being substantially as shown in the aforesaid drawing, in which—

A denotes the magnetic needle; *a a*, the longitudinal slots thereof; B, the card or divisional plate, which in this case is shown as a flat annulus. D D, &c., are the sets of auxiliary U-magnets, there being six of such sets in all, which in practice we have found to be generally sufficient. The number, however, may be increased if necessary, and there may be two or more such magnets in each set.

We have found that when we have the two magnets or sets which are at right angles to the needle stronger in their magnetic power than each of the flanking magnets, not only are the effects of local attraction neutralized, but the card or magnetic needle becomes quicker to operate and more sensitive and accurate. While we do not pretend to explain

the cause of such, we have found such results to be attained in practice.

In the drawing two U-magnets are shown to each set, except at the east and west points of the card, where there are three of such magnets in each of the sets, the magnets being marked *m*.

Through tests of a compass-card made in accordance with our invention we have proved it not affected by local attractions such as it would be ordinarily subjected to on land or shipboard.

We are aware that a magnetic needle of a lozenge form having a triangular opening in each one is not new; also, that it is not new to have to a compass-card and its needle a series of bar or plate magnets arranged radially and at equal or about equal distances apart, and having their north poles toward the south pole of the needle, their south poles being toward the north pole of the magnet. There are distinctive differences between such and our invention, as in carrying out the latter we employ horseshoe or U magnets, with the two poles of each at the circumference of the circle of compensating magnets, whereby we bring all the poles of the magnets, as well as those of the needle, in one circumference; and we not only do that, but have the south pole of each magnet or set of magnets between two north poles of the next adjacent sets, all of which we have found in practice to be productive of results unattainable from bar or plate magnets arranged radially on a card and flanking the needle.

We would also remark that a magnetic needle made as is ours—viz., of a rectangular bar tapered at its poles and having a rectangular slot in each arm—is preferable to the lozenge needle, as above mentioned, it being capable of being magnetized much stronger at its poles.

What we claim is as follows:

1. A magnetic needle tapering at its poles, and rectangular in shape between them, and slotted in its body, as set forth.

2. A mariner's compass-card having a magnetic needle, and provided with horseshoe or U magnets arranged on the said card circumferentially, and with all their poles in or about in the circumference of a circle concentric with

the card, and having the north pole of each magnet toward the south pole of the magnetic needle of such card.

3. A mariner's compass-card having a mag-
5 netic needle, and provided with horseshoe or
U magnets arranged on it (the said card) cir-
cumferentially, and with all their poles in or
about in the circumference of a circle concen-
tric with the card, and having the north pole
10 of each magnet toward the south pole of the

needle, and the magnets of the east and west points stronger in their magnetic power than either of the others, or sets thereof, all being essentially as specified.

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