(No Model.) 2 Sheets—Sheet 1.

E. B. ROCKWELL.

MACHINE FOR HOLDING, LIGHTING, AND KEEPING IN POSITION MARINERS' COMPASSES.

No. 565,636. Patented Aug. 11, 1896.

Fig. 1.

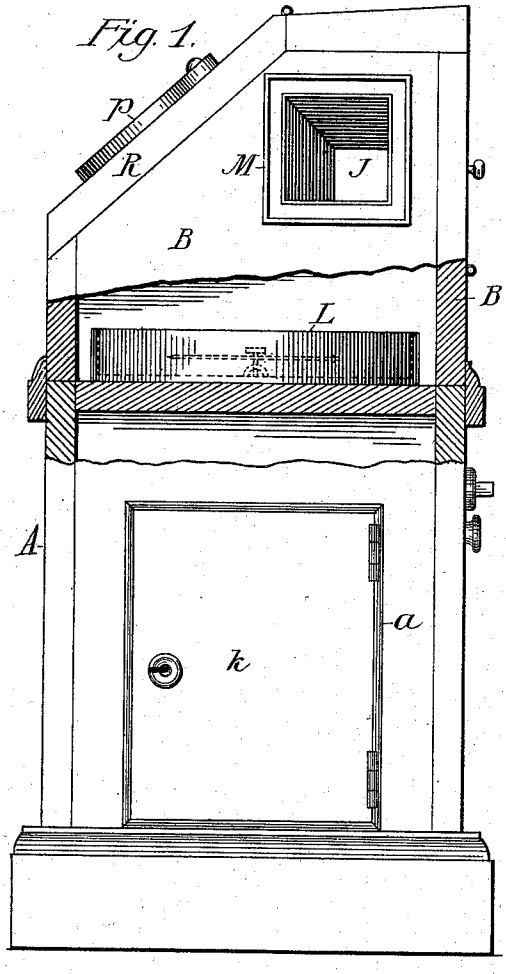


Fig. 2.

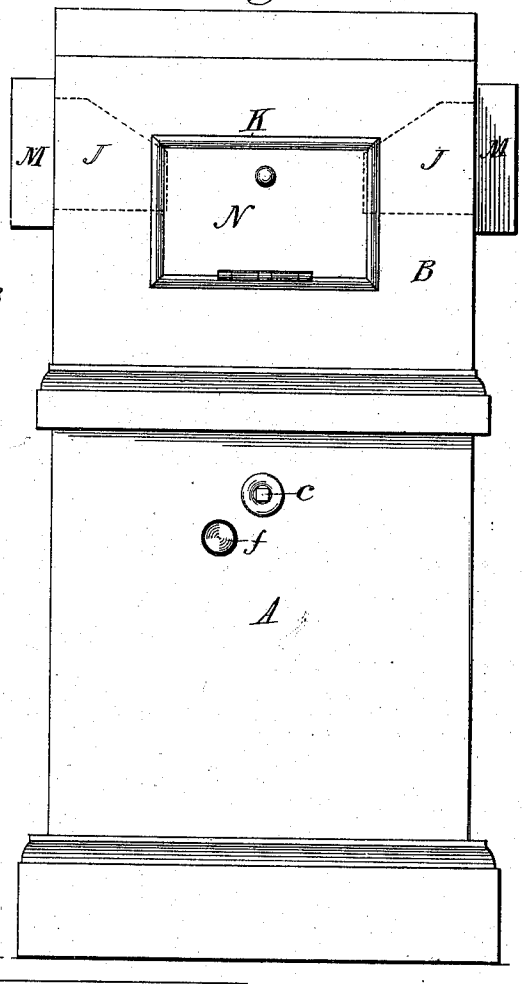
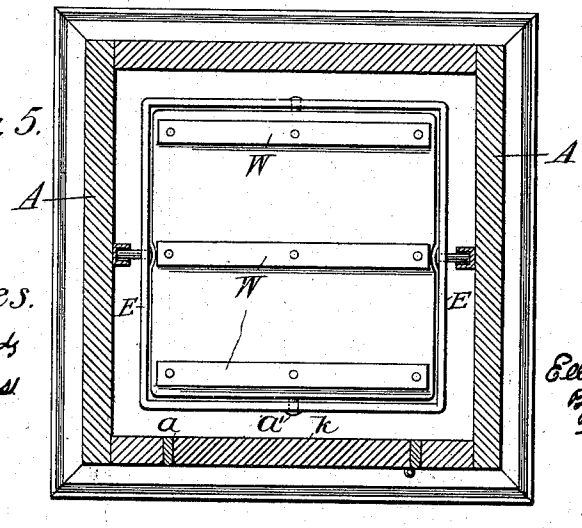


Fig. 5.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

E. B. ROCKWELL.

MACHINE FOR HOLDING, LIGHTING, AND KEEPING IN POSITION MARINERS' COMPASSES.

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Fig. 3.

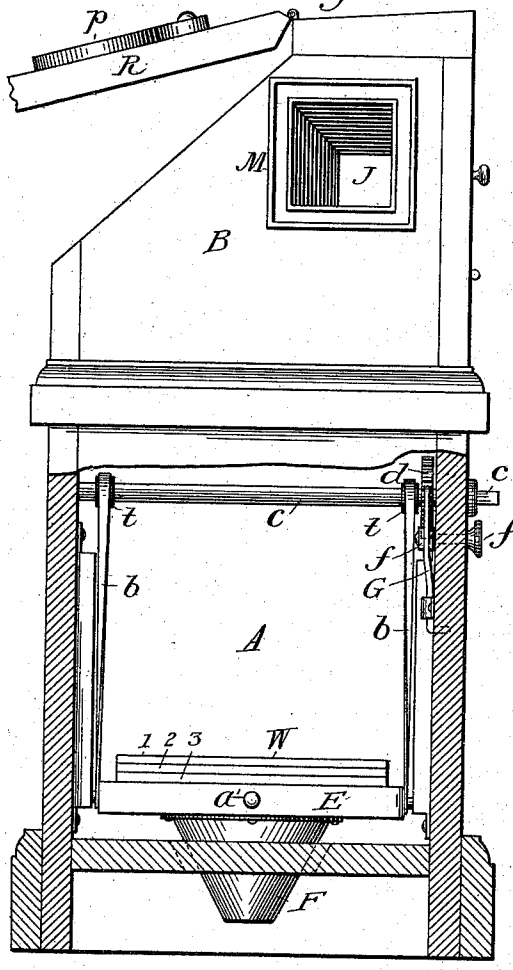


Fig. 4.

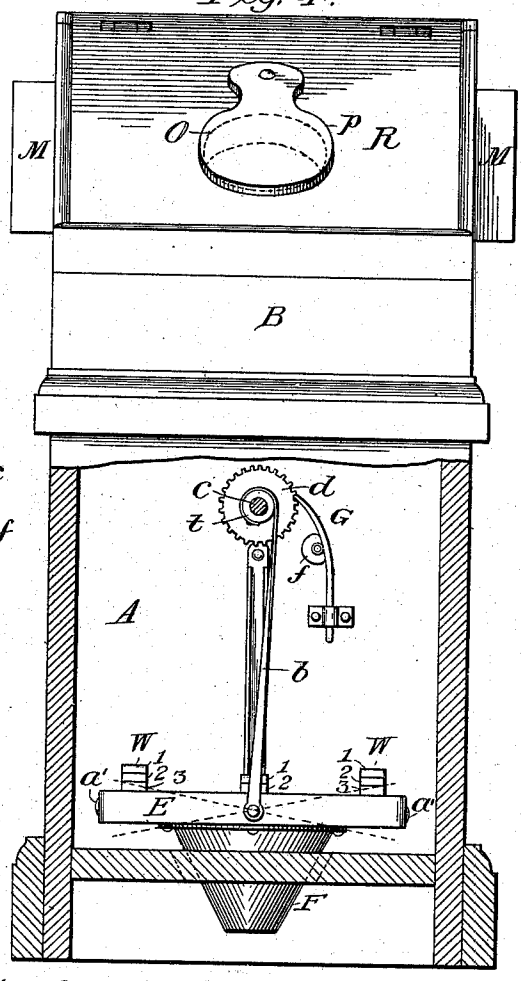
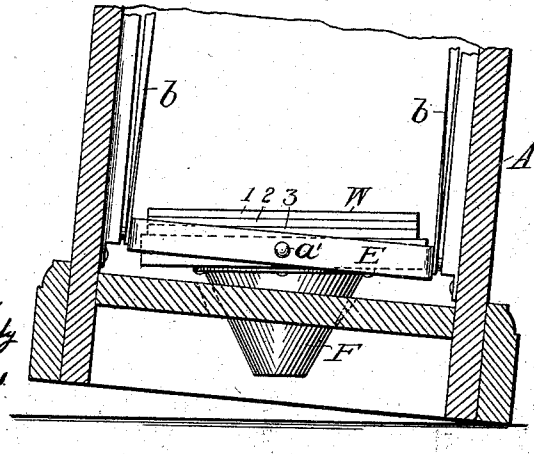


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELL B. ROCKWELL, OF ALBURG, VERMONT.

MACHINE FOR HOLDING, LIGHTING, AND KEEPING IN POSITION MARINERS' COMPASSES.

SPECIFICATION forming part of Letters Patent No. 565,636, dated August 11, 1896.

Application filed July 12, 1895. Serial No. 555,726. (No model.)

To all whom it may concern:

Be it known that I, ELL B. ROCKWELL, a citizen of the United States, residing in the town of Alburg, in the county of Grand Isle and State of Vermont, have invented a new and useful Machine for Holding, Lighting, and Keeping in Position a Mariner's Compass when it is Used in Navigating a Vessel, of which the following is a specification.

My invention relates to a device called a "binnacle," which is constructed in such a manner that the magnets that are used to counteract local attraction are kept in the same relative position to the needle notwithstanding the tipping and rocking motion of the vessel caused by the wind and the waves, and also a device to throw a light upon the dial, so that the position of the needle may be readily seen. I attain these objects by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my compass. Fig. 2 is a rear elevation thereof. Fig. 3 is a side elevation, partly in section, to show the elevator carrying compensator. Fig. 4 is a similar view from the front of the device. Fig. 5 is a sectional view showing the elevator in plan. Fig. 6 is a sectional detail view showing the position of the elevator when the binnacle is tipped.

A represents an upright wooden box about one foot square and twenty inches high, with an opening *a*, door *k*, on one side. On the top of this box is a mariner's compass L, Fig. 1. The side of the cover B is broken away to show the compass. The cover B is provided with a square tube on each side of the cover J J, Fig. 2. The light is reflected through these tubes directly upon the dial of the compass, and lamps M M are fastened to the outside of the cover, so that the light from the lamps is concentrated upon the compass. There is also an opening K on the front side of the cover provided with a door N, which opens downward to let in light from the front through a glass that fills the opening inside of the door N, Fig. 2. The cover B has an opening on the opposite side O, Fig. 4, which is covered by the slide *p*. This opening allows the pilot to see the dial of the compass without removing the cover B or raising the lid.

The object of this invention is not only to see the compass readily at all hours of the day and the night, and in all kinds of weather, but also to provide mechanism whereby magnets are held in such a situation that all local attraction is counteracted and the needle points in the same direction at all times. Magnets have often been used for this purpose, but when the boat or ship encounters waves and is tipping and pitching from side to side the magnets do not remain in the same relative position to the needle, and so that when near rocks, shoals, and reefs, where local attraction usually effects the needle, and therefore where most danger lies, the needle is liable to be out of the true line, and many accidents and wrecks at sea occur from this cause, so that the object of the mechanism described herein is to keep the magnets in the same position in respect to the needle whichever way the ship may be rocked in time of a storm.

The elevator E, Figs. 3 and 4, is a metallic frame, usually made of brass, that moves readily up and down inside of the box A and is raised by two strips of brass *b b*, that wind up on the pulleys *t t* by turning the arbor *c*. The strips of brass are fastened to each side of the elevator, in the middle of which is a spindle that moves up and down in a groove that is made of brass and fastened to the side of the box. The spindles go through the lower end of each strip of brass, and that holds the elevator in the middle, so that it will tip readily, the spindle being the center of motion.

Inside of the elevator E is a block of wood or other material that is fastened by a pivot *a* on each side in the middle, so that it will tip readily from side to side, the pivots *a* being the center of motion. Fastened to the lower side in the center of this block (marked W, Fig. 3) is a weight made of brass and filled with lead. It will be observed that when the boat tips from side to side the elevator E will be kept level by moving upon the spindles at the end of the brass strips *b b*, and when it tips from end to end the block which holds the magnets and to which is attached the weight F will be kept level by moving upon the pivots *a*, and therefore the block which holds the magnets will be kept level whatever

the motion of the ship may be. Now as the mariner's compass that sits on the top of the box is pivoted both ways, so that it always keeps level, the magnets being kept level by the device herein described, will be always kept in the same relation to the needle, and will at all times so counteract the local attraction that the needle will point in its true direction notwithstanding the vessel may be violently rolled or pitched in the time of a storm.

It is necessary to raise or lower the elevator E with the magnets to bring them nearer to the needle or farther away to adjust the compass. The elevator is raised and lowered by a key that is used to turn the arbor *c*, winding up the brass strips *b b* or letting them down. The ratchet-wheel *d* on the arbor *c* is held in place by the catch G. The catch is moved or disengaged from the wheel by the cam *f*, which extends to the outside of the box, as shown in Fig. 3. When the operator lets go of the cam, the catch, being a piece of elastic brass wire, springs back and holds the ratchet-wheel, as shown in Fig. 4.

The block W, Fig. 3, holds the magnets, which are placed three on each side, as shown in Fig. 4, 1 2 3, 1 2 3, and two in the middle, 1 2. These magnets are piled one upon another, as shown in Figs. 3 and 4.

When a vessel is heeled over five degrees from perpendicular, the needle will vary at least one-quarter or one-half of a point from its true course when the needle is adjusted by fixed magnets. This is often the situation of a vessel, especially when sails are used. It will frequently be heeled over more than five degrees in a strong wind, and this invention is designed to correct this variation and keep the needle in its true course. The elevator E and block W make a double balanced support for the magnets. It is then necessary to have the magnets at the proper distance below the needle and be adjusted to a small fraction of an inch by raising or lowering the magnets, as may be done by the mechanism herein described. So if iron on the ship as a part of its freight, or other material, or some attraction on shore or in reefs causes a variation it might be necessary for the master to readjust the compass by raising or lowering the magnets to keep the needle true.

For this improved binnacle for all vessels that use a compass I do not claim, broadly, that I am the first person to use magnets to correct the variations of the needle in a mariner's compass; but by dividing the magnets, as herein described, and piling them three on each side and two in the middle, and for a mechanism that is simple and cheaply made to hold and move the magnets upon the same plane as the needle, and also readily move the magnets up and down to a point where they will correct all local attraction and keep the needle pointing in a true direction,

I claim—

1. The combination of the elevator E and block W holding the magnets piled three on each side and two in the middle, with the strips *b b*, pulleys *t t*, ratchet-wheel *d* to raise and lower the magnets to the exact distance necessary to adjust the compass as herein described.

2. The combination of the elevator E block W, and weight F, with the strips *b b*, pulleys *t t* ratchet-wheel *d* and catch G to raise and lower the magnets to the exact distance necessary to adjust the compass as herein described.

3. The combination of the elevator E and block W, forming a double-balanced platform upon which the magnets are piled, the strongest on each side and the weaker in the middle, with the strips *b b* winding upon the pulleys *t t*, operated by the ratchet-wheel *d* and catch G, to raise and lower the magnets as herein described and for the purpose specified.

ELL B. ROCKWELL.

Witnesses:
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CLARK C. BRIGGS.