

(No Model.)

E. S. RITCHIE.
MARINER'S COMPASS.

No. 503,164.

Patented Aug. 15, 1893.

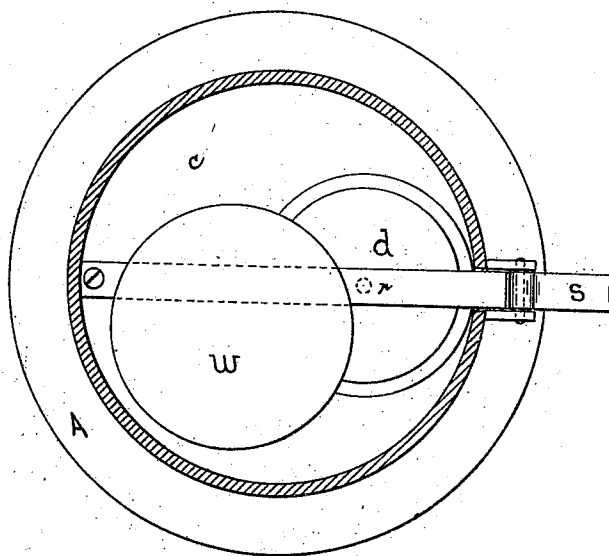


Fig. 1.

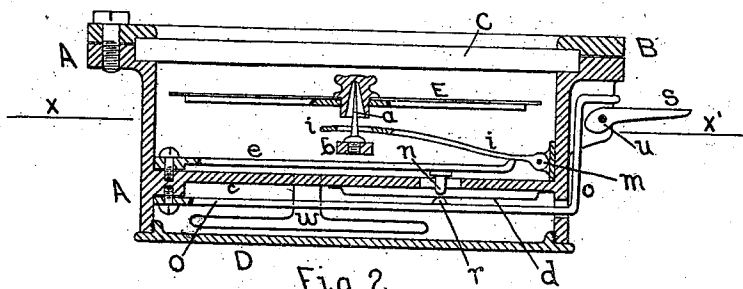


Fig. 2.

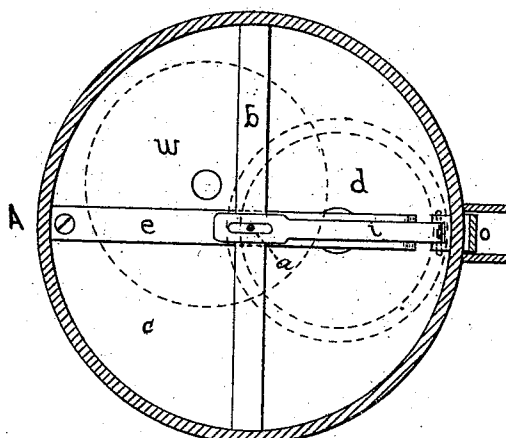


Fig. 3.

WITNESSES:

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MARINER'S COMPASS.

SPECIFICATION forming part of Letters Patent No. 503,164, dated August 15, 1893.

Application filed January 16, 1893. Serial No. 458,476. (No model.)

To all whom it may concern:

Be it known that I, EDWARD SAMUEL RITCHIE, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Mariner's Compass, of which the following is a specification.

My invention relates to improvements in liquid compasses, and the object of my improvement is to provide means to raise the card from its pivot or to hold it stationary; that the position of the card may be seen and noted, and that the force required may be applied and transmitted to the inside of the compass bowl without causing any of the enclosed liquid to escape, or the admission of any bubbles of air within the bowl; which I attain by the mechanism described in the specification and represented in the accompanying drawings of which—

Figure 1 is a bottom view of the compass bowl, the cover being removed. Fig. 2 is a vertical transverse section. Fig. 3 is a top view of a section on the line $x x'$ on Fig. 2.

Similar letters refer to similar parts in the several views.

In the drawings A, denotes the compass bowl of brass or other suitable metal; B, the top ring; C, a glass cover; D, movable cover below the bowl; E, the compass card bearing the usual cardinal divisions, magnetic needle, and central cap to rest upon the supporting pivot a , which is attached to the bar b , extending across the bowl.

The bottom c , of the bowl A, has a hole, or an opening, covering which is a thin flexible metal plate d , having its outer edge raised so that it can be soldered firmly to the bottom plate c , of the bowl. The middle portion of the plate d , is thus separated from, and is parallel with the bottom plate c , so that its central portion can be raised, or be depressed through its elasticity, without coming in contact with the plate c . The lever or arm e , has one end attached to the bowl A. Its opposite end is turned up to come in contact with the lever i , which is attached by a hinge m , to the bowl A. The lever i , extends past the center of the bowl, and has an open slit, allowing its free motion over the pivot a . A projection n , below the lever e , extends through the opening

in the bottom of the bowl, and comes in contact with the flexible plate d . The lever or arm o , is attached by a screw, or by a hinge below the bottom of the bowl A. It is bent, and extends up on the outside of the bowl, and is again bent at right angles. A projection r , on the lever o , comes in contact with the flexible plate d . The lever S is connected with the bowl A, by a hinge u . The portion surrounding the pin of the hinge u , is formed as a cam, on which rests the outer end of the lever o .

In operation, by depressing the lever S, its cam raises the lever o , which raises the center of the flexible plate d , and the interior lever e , which presses up the lever i , bringing it into contact with the card E, raising it, and pressing it against the glass cover C, the card E, will thus be held in position until it is released by the raising of the lever S. To the bottom of the bowl is attached an expansion chamber w , of thin metal, to compensate for the change in volume of the liquid with which the bowl is filled, by change in temperature. This is of usual construction.

It is evident that any mechanical equivalent to the levers o , and S, may be used to produce the external pressure on the plate d . I am aware that a lever has been employed to raise the card from the pivot in dry compasses; and also in liquid compasses, moved by a sliding rod or screw. The objection to such has been the leakage of air, or liquid, around the sliding rod or screw.

It is evident that the projection, n , on the lever, e , and the projection, r , on the lever, o , may be made of one rod passing through the plate, d , and fastened to it air tight, so that it can be used in place of the separate rods n , and r . In practice I prefer to make it in this manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in a compass of the card E, the lever i , the lever e , the flexible plate d , and the lever o , substantially as described.

2. The combination in a compass of the card E, the pivot, a , the lever, i , the flexible plate, d , and the lever, o and connections between the levers o and i , substantially as set forth.

3. The combination in a compass of the bowl A, the pivot *a*, the card E, the flexible plate *d*, the lever *o*, with connections for transmitting external pressure to the card E, and
5 the expansive chamber *w*, substantially as set forth.
4. The combination in a compass of the

bowl A, the flexible plate, *d*, and the expansive chamber, *w*, substantially as set forth.

EDWARD SAMUEL RITCHIE.

Witnesses:

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