

J. D. LEACH.
NAVIGATORS' BEARING-INDICATOR.
No. 170,001. Patented Nov. 16, 1875.

FIG. 1

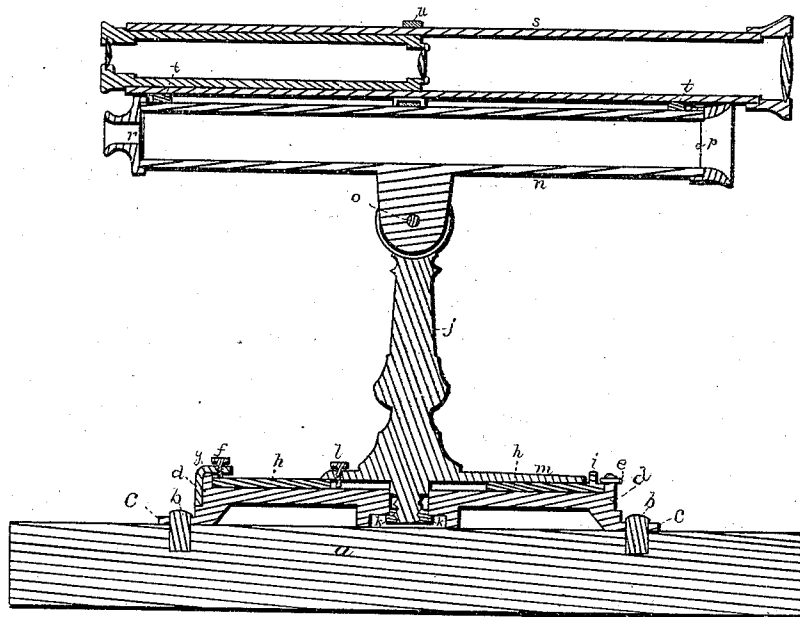
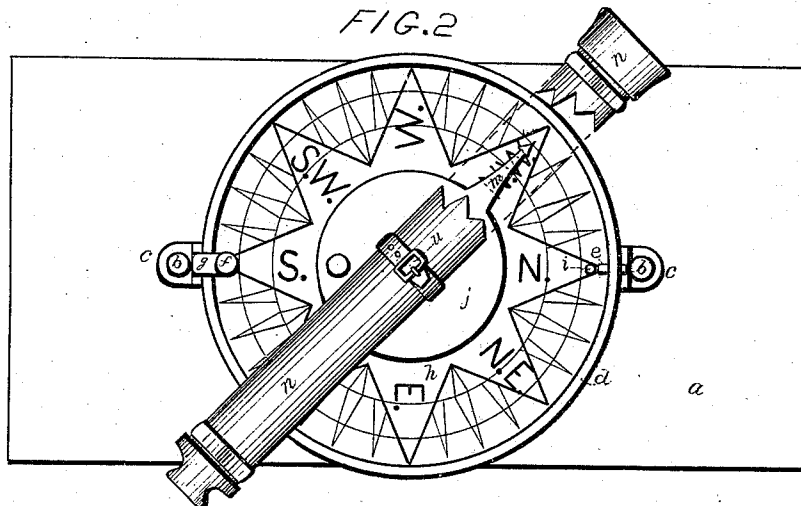


FIG. 2



WITNESSES
Chas. E. Breck
F. B. Collamore

INVENTOR
Joseph D. Leach
By T. W. Porter
Atty

UNITED STATES PATENT OFFICE

JOSEPH D. LEACH, OF PENOBSCOT, MAINE.

IMPROVEMENT IN NAVIGATORS' BEARING-INDICATORS.

Specification forming part of Letters Patent No. **170,001**, dated November 16, 1875; application filed May 17, 1875.

To all whom it may concern:

Be it known that I, JOSEPH D. LEACH, of Penobscot, in the county of Hancock and State of Maine, have invented a new and useful Navigator's Bearing-Indicator, of which the following is a specification:

This invention relates to an instrument by the aid of which navigators are enabled to determine with the greatest accuracy the bearing or direction of any object from their vessel; and the invention consists in an instrument composed of the following parts, or their equivalents: A bed-plate constructed and arranged to be readily removed or fixed in position upon the part of the vessel from which the observation can be most conveniently made, this bed being provided with a fixed point, termed the "lubber-mark," by which to adjust the revolving card, and a locking-screw for securing the card in position. This card revolves upon the central standard, and is subdivided into "points," and marked like the common compass-card. The standard is secured and revolves in the center of the bed, and at its base is provided with a locking-screw and indicating-point, which moves over the face of the card as the standard is revolved, and is locked in any desired position by the locking-screw. In the top of this standard is pivoted (to allow a vertical adjustment) a tube provided at one end with an eye-piece, and at the other with the usual cross-hairs, or with fine wires. Upon this tube are holders, in which a telescope may be laid, in the direction of the tube, and secured for use, when such an instrument may be necessary.

Figure 1 is a vertical section taken in the axial line of the tube. Fig. 2 is a top or plan view, with the sighting-tube partly broken away to show the movable indicating-point.

The bearing-indicators heretofore invented and patented by myself were only useful upon vessels in which the wheel was in the forward part, as they could only be used in direct connection with the compass; and hence upon vessels in which the steering-wheel is near the rudder-head, or aft the sails, they could only be used when the object to be observed was "broad off" the beam or quarter, as the sails obstructed the view forward, so that the indicator could but seldom be used. To remedy

these defects I have invented my present indicator, which in no case is used in connection with the compass, and which may be used upon any desired part of the vessel, such as the taff-rail, the rail upon the quarters, the bows, amidship, the windlass-bitts, or at the mast-head, by simply providing the means of placing it in position, thus giving the navigator its full benefit, without regard to the position of the object relatively to the vessel, and enabling him to determine the position of such object with the same accuracy that he determines the course his vessel is pursuing.

In the drawings, *a* is a section of the vessel's rail, or a bed-piece to be secured to the vessel. *b b* are two pins, which are inserted in bed *a*, and which receive the ears *c c* of the indicator-bed *d*, when it is placed in position for use. The pins *b b* must be so placed that a line passing through the center of each shall be exactly parallel with the midship or central fore-and-aft line of the vessel. *e* is the lubber-mark, a pin or indicator fixed in the raised rim or periphery of bed *d*, and exactly in the central line of pins *b*. *f* is a set-screw, threaded in bracket *g*, and serving to lock the card *h* in position. This card is marked with the usual compass-points, as shown in Fig. 2, or in such other equivalent manner as serves to facilitate its use. This card, when not locked by screw *f*, may be freely rotated upon bed *d* by means of pin *i*, secured in the card. *j* is the standard, pivoted and revolving in bed *d*, to which it is secured by screw-nut *k*. A set-screw, *l*, threaded in the base of the standard, and acting upon bed *d*, serves as the means of locking the standard in position. *m* is a pointer, formed upon or attached to the standard. *n* is the sighting-tube, pivoted to the standard at *o*, and vertically adjustable. This tube must exactly coincide with a line passing through the center of the standard and the end of pointer *m*. *p* represents the cross-hairs, and *r* the eye-piece. *s* is a telescope, which, when used, is laid in the curved bearings *t t*, secured upon tube *n*, a strap, *u*, serving to secure the telescope in place.

The practical use of this indicator I will illustrate by reference to Fig. 2 in the drawings. Suppose the course to be pursued is due north until the object or land-mark bears northwest,

(when that course will be taken,) and that the vessel has reached the position where she should haul up on the new course—the navigator, to verify this fact, will so adjust the card that the north point is at the lubber-mark *e*, as shown, and the card will be so locked. The indicator is placed in position upon pins *b*, with the north point toward the head of the vessel, and the sighting-tube *n* brought to bear upon the land-mark, when, if in the night, it would be locked by screw *l*, and the indicator taken to the light, and the pointer *m* being found upon the northwest point, would show that the vessel should then be hauled up on the new course; but if in this supposed case the pointer *m* had been found to the west of northwest it would show that the vessel had not arrived at the point for changing its course, while if the pointer had been found between northwest and north it would demonstrate that the vessel had passed the point at which her course should have been changed.

It will thus be seen that it is only necessary to place at mark *e* the point on the card corresponding to the direction in which the vessel is sailing, and then placing the indicator in

position with point *e* toward the head of the vessel, when, by bringing the sighting-tube to bear upon the land-mark, the pointer *m* will always indicate upon the card *h* the direction (by compass) of such land-mark from the vessel.

The telescope *s* may be used in the same manner as tube *n*, in connection with the indicator.

Wherever upon the vessel a pair of pins, *b*, are fixed parallel with the central line of the vessel, there the indicator may be used with the certainty of correct results.

I do not claim an indicator to be used in connection with the ship's compass, as described in my said patents; but

What I do claim as my invention is—

In a bearing-indicator, the combination of bed *d*, lubber-mark *e*, locking-screw *f*, ears *c c*, rotating standard *j*, locking-screw *l*, pointer *m*, pivoted sighting-tube *n*, and cord *h*, substantially as described and shown.

JOSEPH D. LEACH.

Witnesses:

CALVIN DAVIS,
SEWALL LEACH.