

J. McNABB.  
MARINERS' COMPASS.

No. 177,869.

Patented May 23, 1876.

Fig. 1.

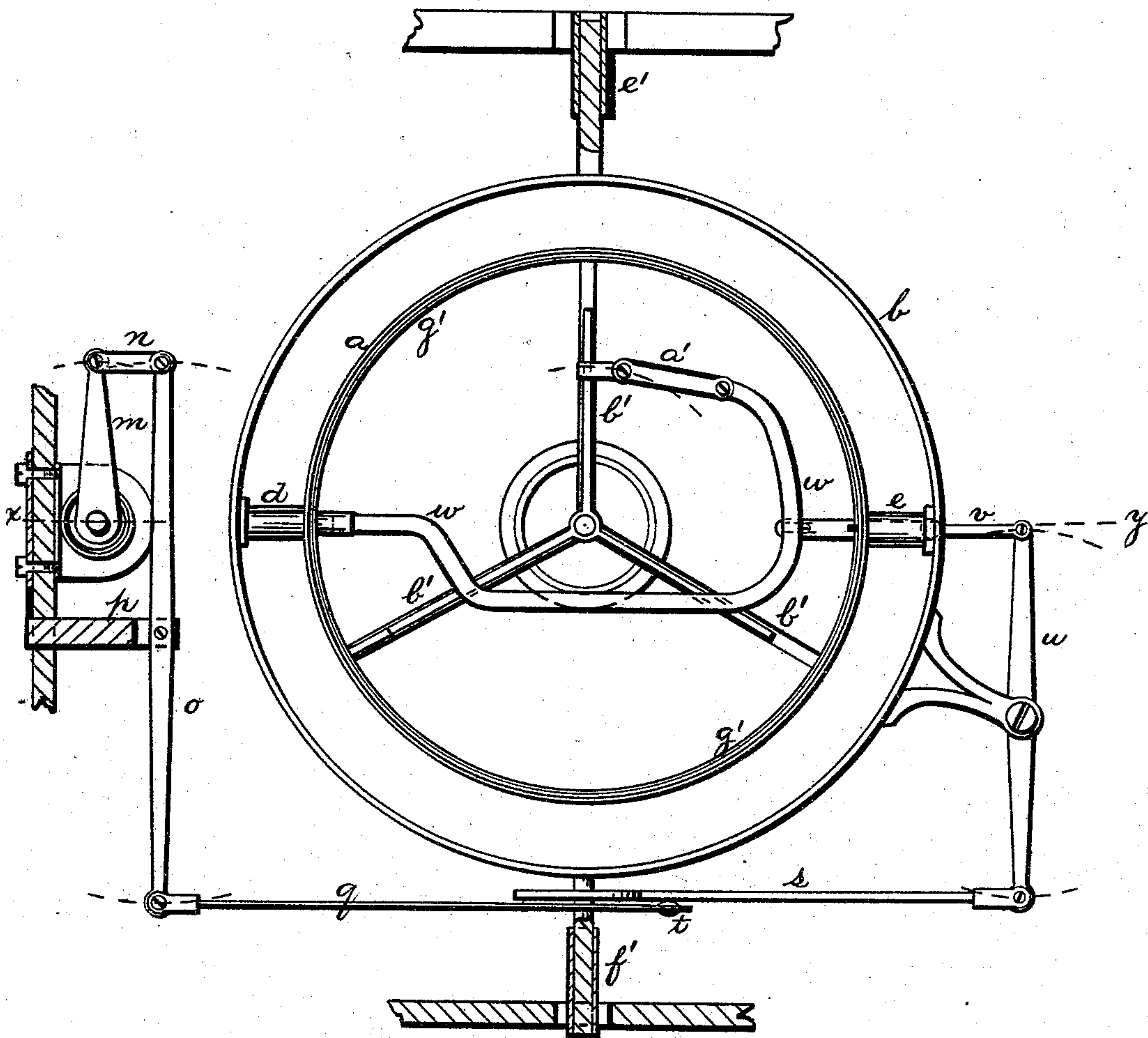


Fig. 2.

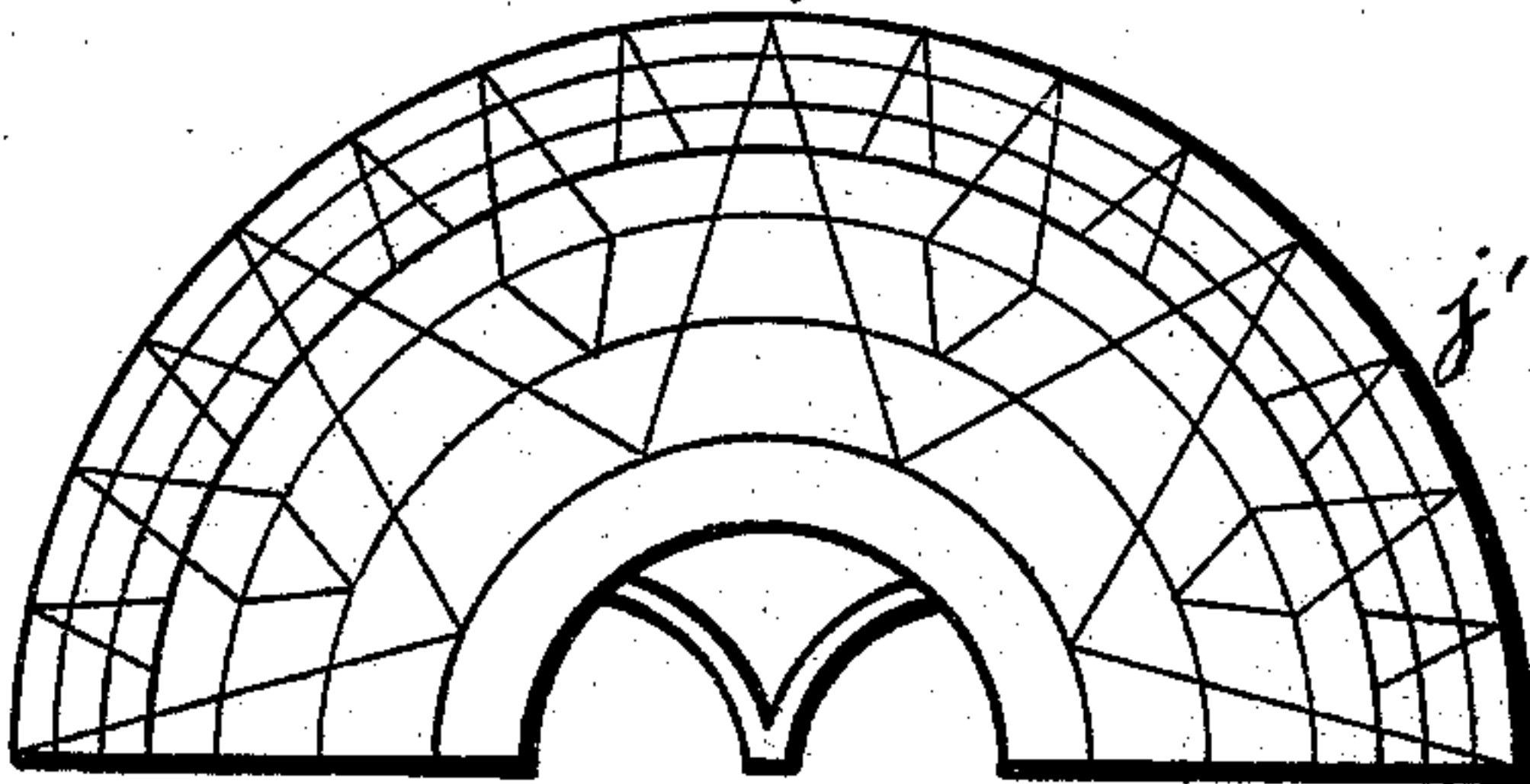


Fig. 3.

Witnesses:

*H. P. Howell*  
*Chas. R. Burt*

Inventor:

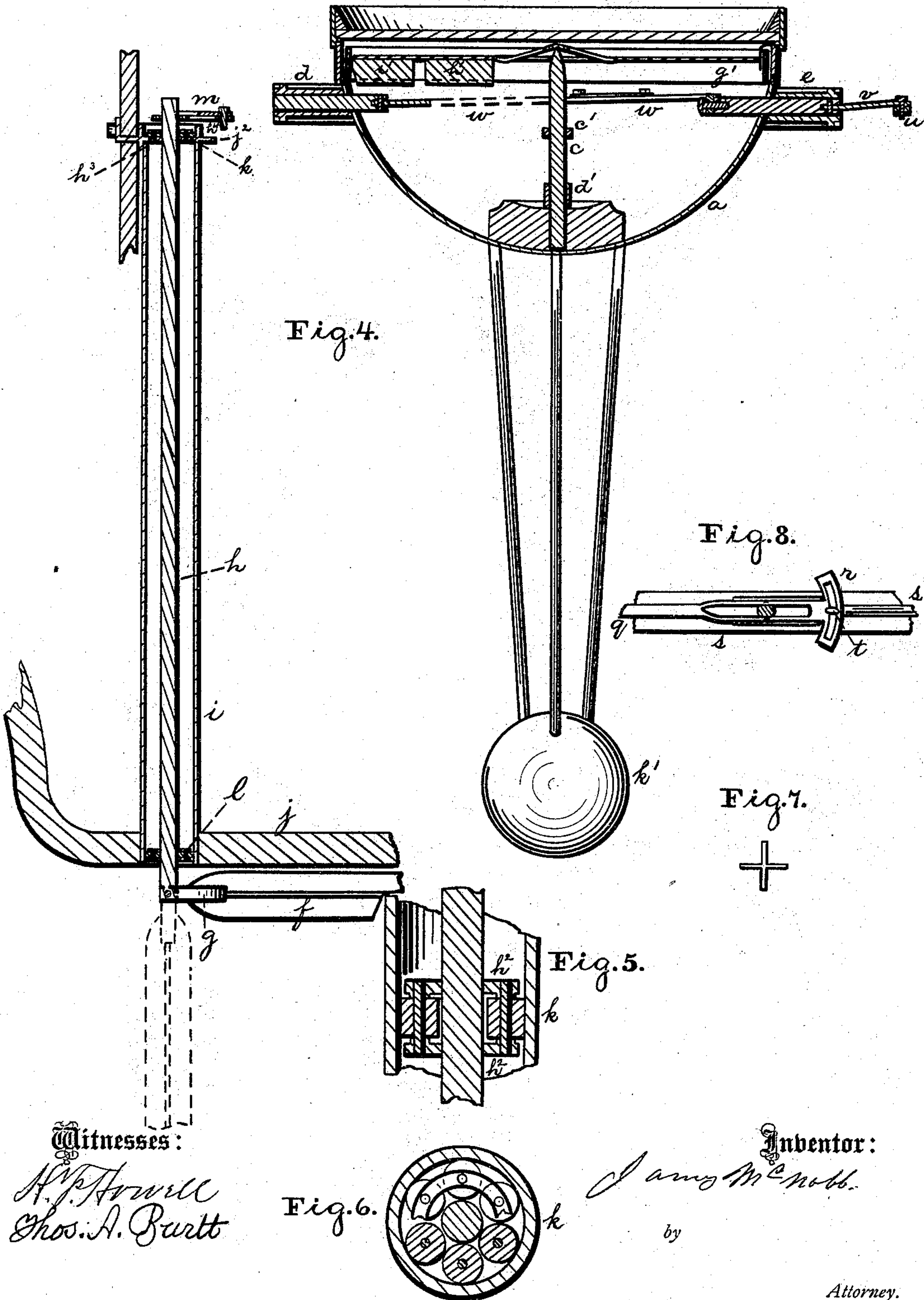
*James McNabb*

Attorney.

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Geo. A. Burt

Fig. 6.

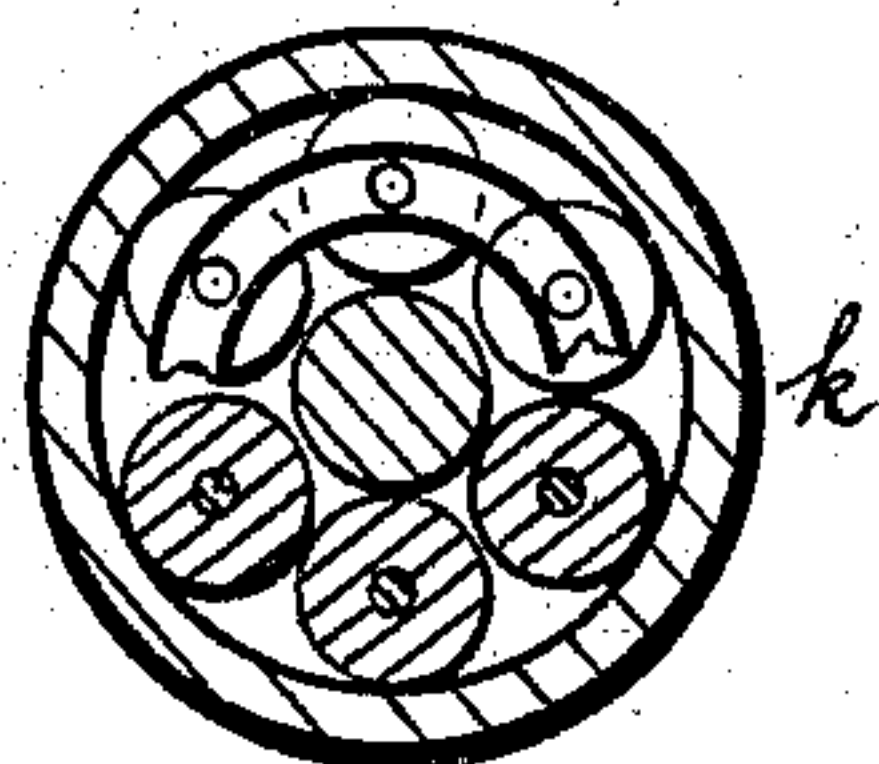


Fig. 5.

Inventor:  
James McNabb.

by

Attorney.



# UNITED STATES PATENT OFFICE.

JAMES McNABB, OF WIDDER, CANADA.

## IMPROVEMENT IN MARINERS' COMPASSES.

Specification forming part of Letters Patent No. 177,869, dated May 23, 1876; application filed February 14, 1876.

*To all whom it may concern:*

Be it known that I, JAMES McNABB, of Widder, Lambton county, Ontario, in the Dominion of Canada, have invented certain Improvements in the Marine Compass, of which the following is a specification:

My invention consists, first, of devices for detecting the leeway of a vessel; second, an arrangement of the needles.

In the annexed drawings, Figure 1 is a plan of a compass embracing my said improvements, the card being removed. Fig. 2 is a plan of one-half the card; Fig. 3, a vertical section of the card and of the needles; Fig. 4, a vertical section, on the line *x y*, of the compass, embracing my said improvements, omitting the gimbal. Figs. 5 and 6 are, respectively, vertical and horizontal sectional views of the tube *i*, shaft *h*, and friction-rollers around said shaft, on an enlarged scale. Fig. 7 is a transverse section of the feather *f*. Fig. 8 is a side elevation of the joint *q r s t*.

*a*, Fig. 1, represents the bowl of the compass; *b*, the gimbal; *c*, Fig. 4, the center-pin, all of which are of ordinary construction. *d* and *e*, the horns of the bowl, are tubular. *f*, Fig. 4, is a feather or blade (shown in two positions) connected freely by a stirrup, *g*, and pivot to a vertical shaft, *h*, which passes through a tube, *i*, extending from the deck *j*<sup>2</sup> through the bottom of the vessel, marked *j*, Fig. 4. *k* and *l*, Figs. 4, 5, and 6, are friction-rollers surrounding the shaft *h* at its upper and lower ends. These rollers have bearings in the collars *h*<sup>2</sup> and *h*<sup>3</sup>, respectively. The flat faces of the rollers in the collar *h*<sup>3</sup> travel on the head of the tube *i*, their edges being in contact with the curb *h*<sup>4</sup>. The shaft is thus supported on the tube *i* by means of the collar *h*<sup>3</sup>. *m*, Figs. 1 and 4, is a short arm rigidly attached to the upper end of the shaft *h*. *n*, Fig. 1, is a link connecting the arm *m* with the lever *o*, which is pivoted to a spur, *p*, proceeding from the binnacle, (a portion of which is shown in section.)

The lever *o* is flexibly attached to one end of the sliding rod *q*, Fig. 1, which is forked, and which carries the slotted segment *r*; the forks of said rod embracing the gimbal-pin, all as shown in Figs. 1 and 8. *s*, Fig. 1, is a forked sliding rod, which is provided with a spur, *t*,

which slides in the slot of the segment *r*, the fork embracing the gimbal-pin. The rod *s* is connected, by a flexible joint, with the lever *u*, Fig. 1, which is connected, by a flexible joint, with the rod *v*, Figs. 1 and 4, which slides through the tubular horn *e* of the bowl, and is attached, at its inner end, by a swivel, to the frame *w*, which, by a link, *a'*, is attached to the nonius-frame *b'*, which swings upon the center-pin by sleeves *c'* and *d'*, Fig. 4. *e'* and *f'*, Fig. 1, are the gimbal-horns, which have bearings in the binnacle, as usual.

The system of levers and connections above described are necessary to convey the motion communicated by the feather *f* of the shaft *h* to the nonius *g'* without communicating to the compass any motion due to the motion of the vessel.

The feather at all times corresponds with the course the vessel is making, and governs the nonius, so as to indicate to the mariner the leeway of the vessel. The feather is shown by dotted lines in the position it holds when the vessel is not moving. When necessary, on account of the shallowness of the water, or for any other reason, the shaft *h* and the feather *f* may be drawn up into the tube *i*, out of the way of danger.

*h*<sup>1</sup> and *i'*, Figs. 3 and 4, are the needles. They are placed at the south side of the card *j*<sup>1</sup>, in line, and, preferably, with a space intervening between them, as shown. The positive poles of the needles point directly to the center-pin, and when thus constructed and arranged they are beyond the influence of local attraction.

Instead of employing two needles arranged in line, (each needle consisting of a single bar, as set forth,) any number of such needles so arranged, or a single needle consisting of a single bar, or a single needle composed of a number of separate thin plates or leaves placed side by side, in the usual way, may be employed, or two or any number of needles, each composed of separate leaves, as last mentioned, (said needles being arranged in line, as aforesaid,) may be employed, provided, in each instance, the needles or needle employed be located directly south of the center-pin and at right angles to the east and west line of the card.

$k'$ , Fig. 4, is a weight attached by fixed rods to the bowl of the compass. A single rod or any number of rods may be employed for this purpose. The rods may have any length the depth of the binnacle will allow. The operation of the weight  $k'$  is to keep the compass level at all times without regard to the motion of the vessel.

I claim—

1. The combination of the feather or blade  $f$  of shaft  $h$ , with the nonius  $g'$ , by flexible connections, to indicate the leeway of a vessel

and show her true course, substantially as set forth.

2. The combination, with the card, of one or more magnetic-needles arranged south of the center-pin, and at right angles to the east and west line of the card, for the purpose of neutralizing the influence of local attraction, substantially as set forth.

JAMES McNABB.

Witnesses:

H. F. HOWELL,  
THOS. A. BARTT.