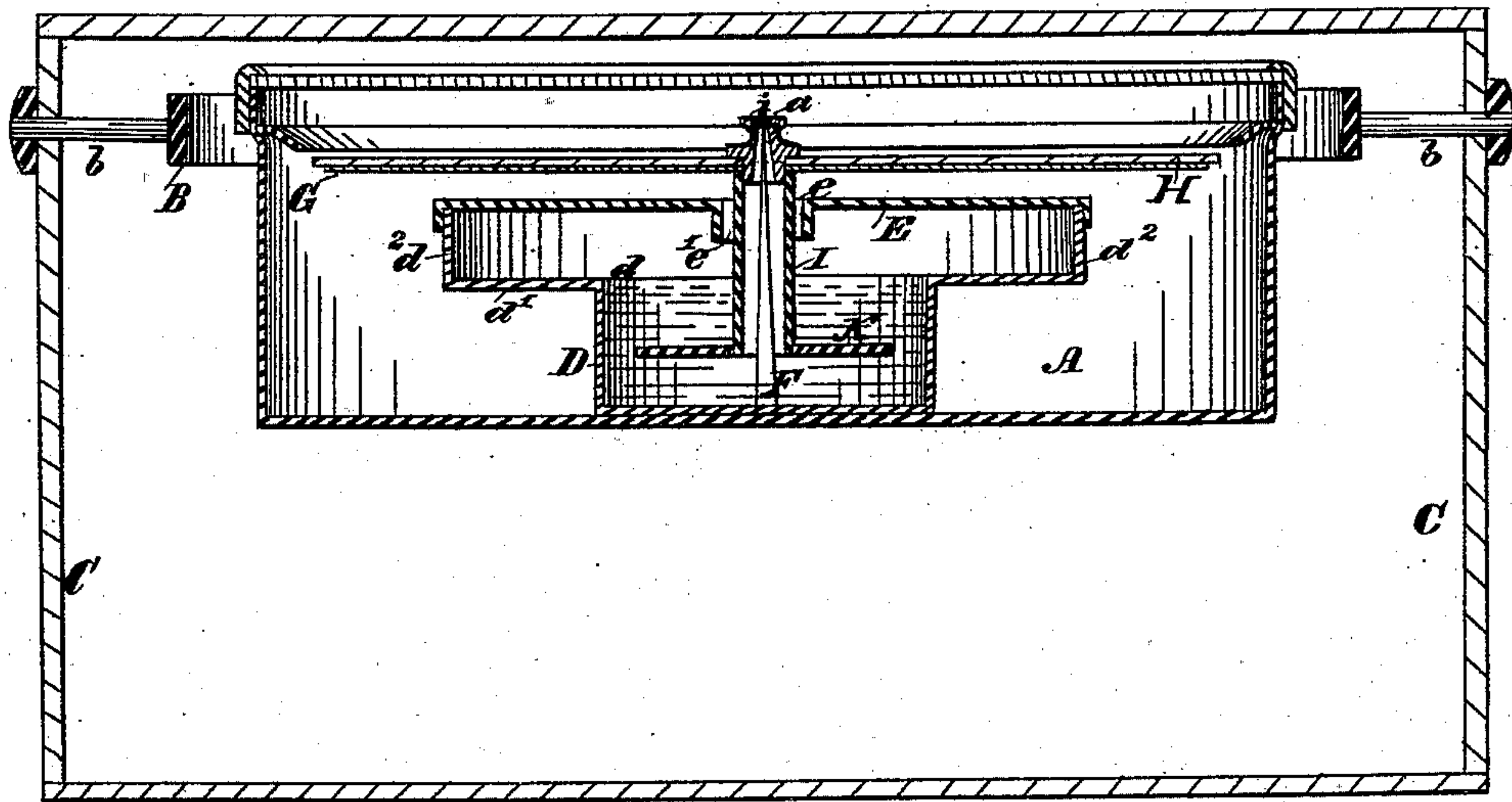


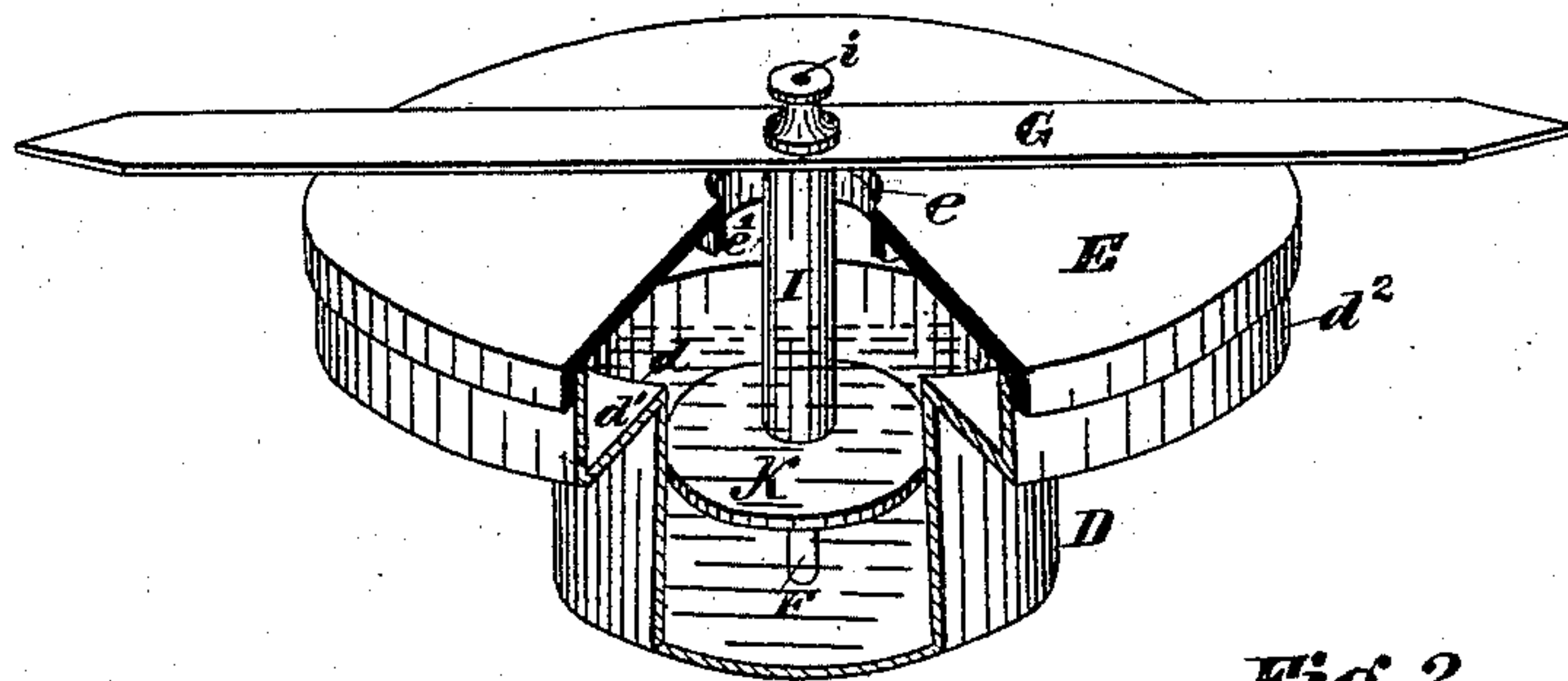
J. F. WATSON.  
Mariner's Compass.

**No. 216,919.**

**Patented June 24, 1879.**



*Fig. 1*



**Fig. 2**

*WITNESSES:*

*INVENTOR,*

R. E. Allen  
John J. Darby

John Forrest Watson,  
By Counolly Bros., ATTORNEYS.



# UNITED STATES PATENT OFFICE.

JOHN F. WATSON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN MARINERS' COMPASSES.

Specification forming part of Letters Patent No. **216,919**, dated June 24, 1879; application filed November 12, 1878.

*To all whom it may concern:*

Be it known that I, JOHN F. WATSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Mariners' Compasses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a transverse vertical section of my invention, and Fig. 2 is a perspective detail.

My invention has for its object to provide a mariner's compass which shall combine the advantages of wet and of dry compasses as at present constructed, without the defects of either, and which shall be adjustable, so as to cause the needle and card to move either fast or slow, as hereinafter fully described.

My improvements consist in the peculiar construction and combination of parts, as hereinafter set forth, having reference particularly to the provision of a vessel surrounding the center-pin and below the needle, and adapted for the reception of the fluid, hereinafter set forth, and to the combination, with the needle and card, of a hollow shaft or sleeve, which extends downwardly into the aforesaid fluid-vessel, said shaft or sleeve being provided with a disk designed to be submerged in the fluid contained in said vessel, as hereinafter fully described.

Referring to the accompanying drawings, A indicates an ordinary metallic shell, of any suitable shape, hung on trunnions *a* within a ring, B, similarly hung at *b b* in a case or box, C. D is a vessel secured to the bottom of the shell A, or it may be made in one piece therewith. Said vessel is cylindrical in form from its bottom up to the point *d*, where it enlarges, forming a shelf, *d*<sup>1</sup>, whence the sides *d*<sup>2</sup> proceed upwardly, and are fitted with a top, E, having a central aperture or opening, *e*, which, by preference, has a depending annular flange, *e'*.

F shows the center-pin, on which the needle G is balanced; and H, the card, secured to and moving with said needle when the latter moves, said center-pin being secured fast to

the bottom of the vessel D, and projecting above the top E, through its opening *e*.

I is a hollow shaft or sleeve, to which the needle G and card H are secured, having at its upper end a jewel, *i*, which rests on the point of the pin F. Said shaft or sleeve I encircles the pin or post F, and extends downwardly nearly to the bottom of the vessel D. It is provided with a disk, K, of less diameter than said vessel, so as to avoid touching the sides of the same under any circumstances.

The operation is as follows: The parts already described are fitted together, as shown and set forth. Glycerine, either pure or diluted, is poured into the vessel D, filling, or nearly filling, the same as high as the shelf *d*, submerging the disk K, and surrounding the lower part of the shaft or sleeve I. As the needle turns, owing to the change in the direction of the vessel carrying the compass or to other cause, the shaft I and disk K move or revolve in the glycerine held in the vessel D. The fluid, owing to its viscid character, offers sufficient resistance to the disk K to cause its movement to be somewhat retarded, yet not enough to prevent the needle from obeying the magnetic influences which properly control it. This retardation of the movement of the disk not only causes the needle to move more slowly and come to a stop more quickly than in a dry compass, but also prevents the rapid shaking or vibration of the needle, which is a source of so much annoyance in dry compasses.

The advantage this compass possesses over what are known as "wet compasses" is, that in the latter the needle and card are submerged and move in alcohol or other liquor. This liquor is contained in perfectly air-tight vessels, so as to prevent the evaporation which would otherwise speedily occur; but if a particle of air gains admission to such vessels, as it frequently does, the usefulness of the compass is at an end until it has been repaired or set aright by the exhaustion of such air. In the present case the vessel is not air-tight, but open, no damage resulting from any evaporation that might occur, such evaporation being under any circumstances almost or wholly inappreciable.

The glycerine being non-freezing, the action



of the compass is unaffected by variations of temperature, and hence is equally reliable and certain in every clime and at all seasons of the year.

To adjust or change the motion of the compass from slow to fast, the glycerine may be diluted with water, according to the requirements of the case, and vice versa, when fast may be made slow by adding pure glycerine to the dilution in use.

To avoid spilling the glycerine is the object of making the vessel D of increased diameter near the top. Owing to this construction the vessel D may be tilted from a vertical into a horizontal position without losing any of the glycerine, the liquid flowing into the space between the leaf  $d^1$  and top E, but failing to rise as high as the central opening,  $e$ , in said top.

What I claim as my invention is—

1. In a compass, a vessel, D, adapted for holding liquid, and located wholly below the needle, said vessel having a top, E, with opening for the passage of the center pin or post, and a pin or post, F, projecting from its bot-

tom through said opening, substantially as shown and described.

2. The combination of vessel D, adapted for holding liquid, and having center pin or post, F, with needle G, hollow shaft or sleeve I, and disk K, substantially as shown and described.

3. In combination with vessel D, pin or post F, needle shaft or sleeve I, and disk K, a body of glycerine located within said vessel to serve as a resistant to the disk and prevent the too speedy motion of the needle, as set forth.

4. The vessel D, having a cylindrical base, enlarged at the upper portion to prevent spilling when the compass is tilted, in combination with top E, having central opening,  $e$ , as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of November, 1878.

JOHN F. WATSON.

Witnesses:

JOS. B. CONNOLLY,  
CHAS. F. VAN HORN.