

# THE PEMBERTON AZIMUTH ANGLE ATTACHMENT

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## 1. OBJECT.

The object of this instrument is to enable horizontal sextant angles to be observed and used simultaneously with compass bearings without removing the eye from the compass.

## 2. GENERAL DESCRIPTION.

The instrument consists of a frame supporting a fixed half silvered and half plain glass vertically over the prism of the azimuth ring used with a standard compass.

On the right rear quadrant of the frame a mirror is mounted; this revolves in the same manner as the index mirror of a sextant.

An index arm and vernier are attached whereby the angle through which the mirror is moved can be read on an engraved scale.

It is so designed as to be easily and quickly attachable as a unit to the azimuth ring, so that horizontal angles may be measured to the right or left of the compass direction in which the azimuth sights are pointing.

## 3. USES.

### (a) *Anchoring.*

If it is decided to anchor on a line of bearing from a conspicuous object (Windmill), the angle to some other object (Beacon) can be set on the instrument, either to the right or left, as necessary, of Windmill. At the correct moment for anchoring the Beacon will appear over the azimuth sights above the compass bearing of the Windmill.

Similarly an angle can be taken between two objects, neither of which are on the line of bearing.

In some cases where the accuracy of a survey is doubtful, *e.g.* in the Persian Gulf, the method of cross bearings may be used with the horizontal angle between them and any discrepancy will be detected at once.

### (b) *Horizontal Danger Angles.*

For horizontal danger angles, the angle may be set on the instrument beforehand and, when a bearing is taken, an indication is obtained immediately.

### (c) *Fix by Horizontal Angle and Bearing.*

When moving fast or when objects are near on a large scale chart, a suitable angle taken simultaneously with a bearing would give a reliable and quickly plotted fix, in cases where the cocked hat is liable to be large, *e.g.* in the Shatt al Arab.

### (d) *Narrow Channels.*

When passing perpendicularly between pierheads or up a buoyed channel, angles from the direction which it is required to make good to each pierhead should be equal when approaching them if the ship is on her course.

### (e) *Station Keeping.*

The instrument would be of some value, under certain circumstances, when station keeping.

### (f) *Station Pointer Fixes.*

Station pointer fixes may be taken with a check bearing

## 4. GENERAL NOTES.

When the instrument is in position it will move round with the azimuth ring. Consequently, when the bearing of an object (*Q*) is being taken, the eye will see the object (*Q*) above the prism, as usual.

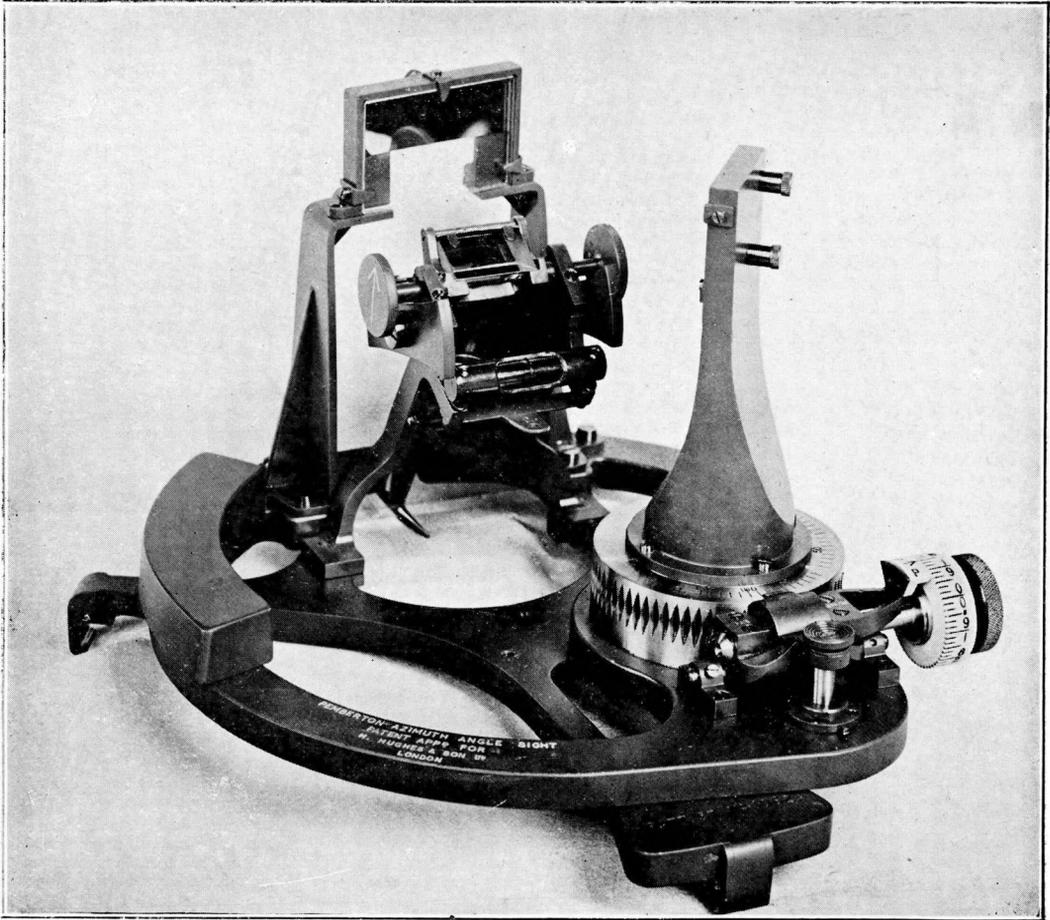
In this case it will be seen through the plain part of the mirror. Above this, in the silvered portion, will appear the reflected image of some other object ( $M$ ) in the same horizontal plane, and the angle between ( $M$ ) and ( $Q$ ) may be read off by means of the divisions on the vernier.

The length of the arc is, at present, 90 degrees to the left, but it could be increased.

The angles may be read off with the same accuracy as they can on a station pointer or protractor.

This new instrument was developed during the year 1930 by the firm of Henry HUGHES & Son, Ltd., Nautical, Aeronautical, Optical and Drawing Instrument Makers, 59, Fenchurch Street, London, E. C. 3.





*Pemberton Azimuth Angle  
Attachment*

*Pièce additionnelle pour angle azimutal  
de Pemberton*