

THE WILLIS NAVIGATING MACHINE

(From information kindly supplied to the Bureau by Messrs. BROWN, Son & FERGUSON, Ltd., 52-58, Darnley Street, Glasgow S. 1.)

Among the numerous ingenious instruments recently invented and destined to facilitate air and marine navigation, one, namely the Navigating Machine designed by Edward WILLIS, an American engineer, is of special interest. It is constructed by Messrs. HEATH & Co., New Eltham, London, and was shown at the recent Shipping Exhibition, Olympia.

Fixing a ship's position at sea involves a complicated solution by spherical trigonometry; the WILLIS machine gives the required results in less than one minute as it is, in reality, a calculating machine. The accompanying illustration gives some idea of the instrument and method of operation.

The inventor has improved the construction of the machine since its first appearance and may in future see his way clear to constructing it at the cost price of £ 60, although this is not definite.

Two types of the machine have been presented, one for the use of seamen, the other for aviation purposes. The length is 11 inches; weight of marine type: about 27 lbs.; weight of aviation type: 7 to 8 lbs.; the former is graduated to read to 1' of arc, the latter to 5' of arc.

The instrument should be regarded as a combination of five protractors designed to read simultaneously the five angles of Nautical Astronomy, viz.: Latitude, Declination, Hour Angle, Altitude and Azimuth. In brief, it will solve the well-known spherical triangle PZX under all conditions.

The accompanying diagram gives some idea of the construction:—

Arc A is the Declination Circle;

Arc B is the Latitude Circle;

Arc $C C'$ is the Hour Angle Circle, the outer rim of which is graduated to degrees and the inner one to time;

Arc $D D'$ is the Altitude Circle;

Arc $E E'$ is the Azimuth Circle.

Each arc is supplied with reader and vernier suitably graduated.

The machine is very easy to handle and the students at the School of Navigation, Royal Technical College, Glasgow, were able by its use to work out a great number of problems without difficulty. It was also shown to the Navigation Instructors of the Royal Naval College, who examined it with great interest.

