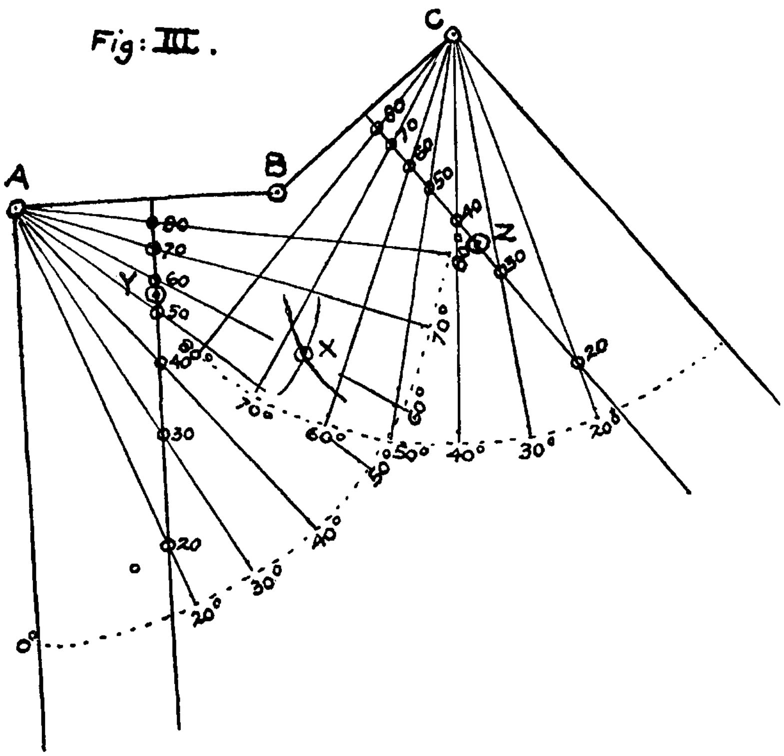
Fig: III.



Thus in Fig. III, if an angle of 55° is observed between *A* and *B* and of 35° between *B* and *C*, by interpolation *Y* and *Z* will be found to be the centres of the two circles and by sweeping two small arcs the position of the observer at *X* will be quickly plotted.

NOTE. — On the sounding board actually used, only the centres of the series of circles and the bisecting lines joining them would be shown, leaving the rest of the area clear for plotting the positions of the fixes as described.

J. D. N.

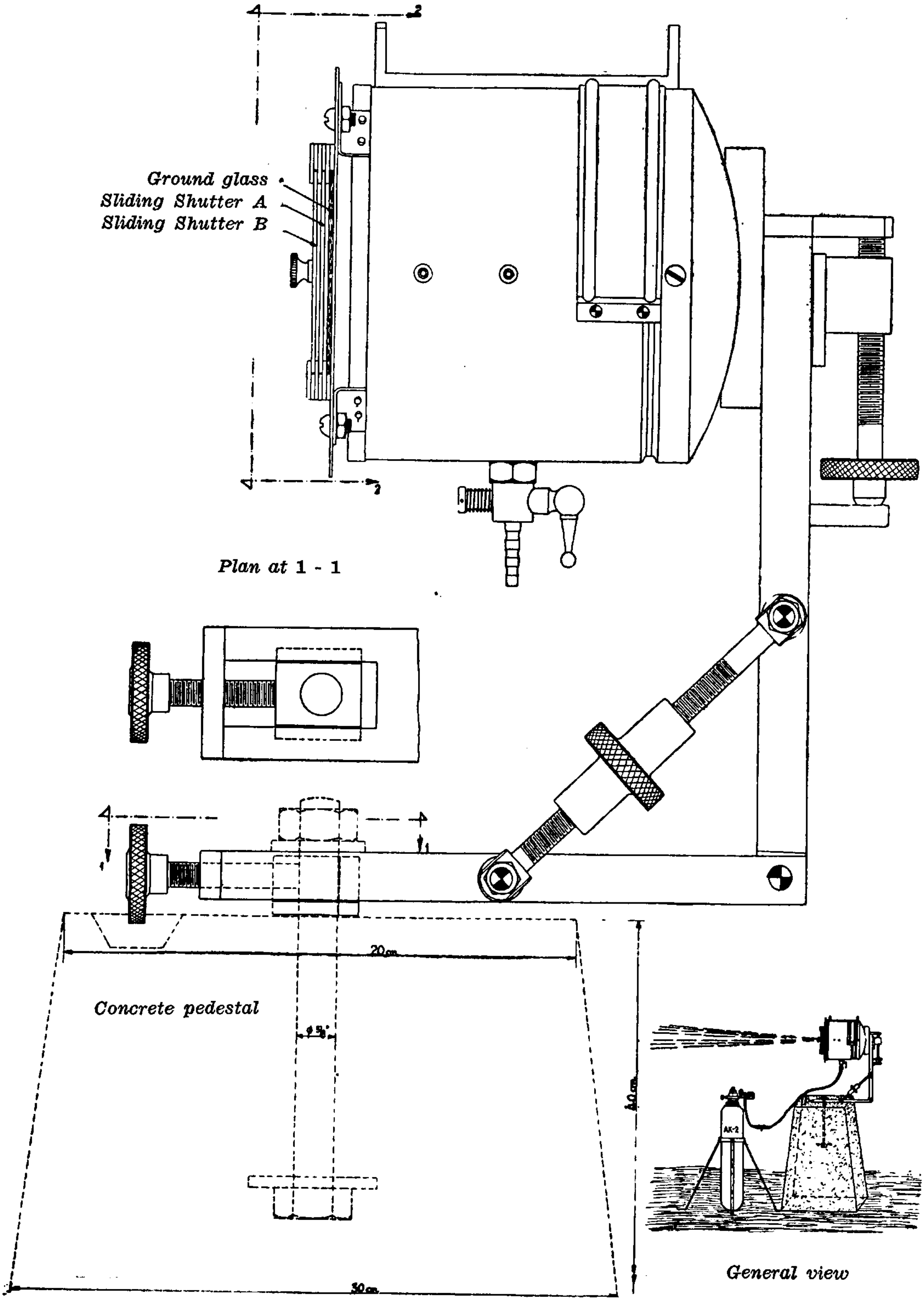
AZIMUTH LANTERN

designed by COMMANDER LUISONI, Head of Hydrographic Section, Argentine Navy.

When it is necessary to determine the "fundamental azimuth" of a side of a triangulation the problem presents no difficulty, particularly with reference to the light, because it is sufficient to place the lantern roughly in the centre of the station, the error of bisection at such a great distance being very small.

But the problem changes completely when the distance is short (about 1,500 metres - 1640 yds.).

A few years ago I was commissioned to define a series of fundamental astronomical control points, with the determination of azimuths, along the Argentine coast. The orders allowed for a maximum stay of a fortnight at each station; the staff at my disposal was very limited and consisted of an assistant, a wireless operator, a cook and a seaman.



LUISONI AZIMUTH LANTERN

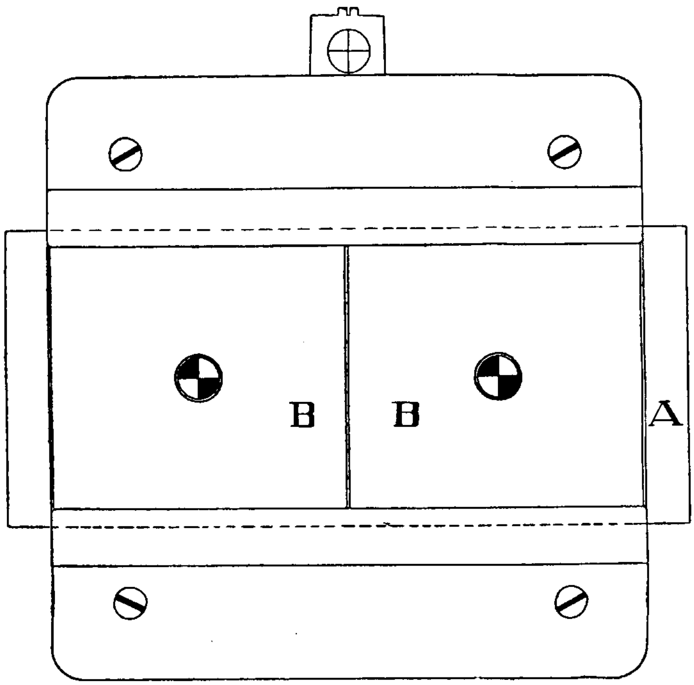
On account of these conditions (time, personnel and lack of mobility), the use of long sides for taking determinations of azimuth was not to be thought of.

Consequently I had to invent a lantern which could be used for this purpose, but using a short side.

The lantern had to fulfil the following conditions :—

1. The light must be projected from the exact centre of the station mark;
2. It must be small enough to do away with any error of bisection.

From this resulted the lantern which is illustrated herewith. Although it is a "Columbus's egg", it is good enough for the required purpose.



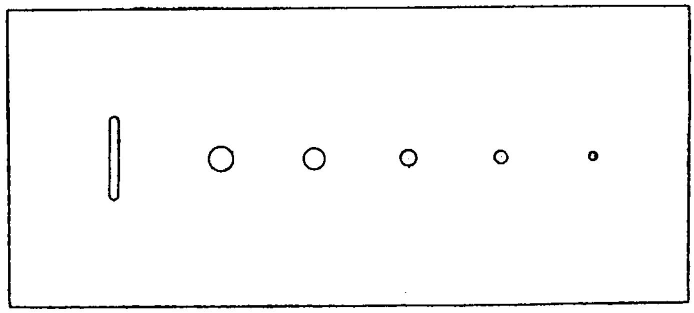
Front elevation 2-2

A glance at the figures is sufficient to understand the details of its construction.

The ground glass before the lens prevents little luminous "halos" from shining through the holes of plate *A* and making it difficult to get a "cut".

As will be seen from the figure, the observer can choose the shape and size of the light, having either a fine luminous line or a luminous point of any desired size.

To get the vertical line, the plate *A* is pushed across till the vertical slit is opposite the centre of the lantern, the shutters *B* being opened at the same time sufficiently far to obtain a strip of light of the desired width.



Detail of Sliding Shutter A

To get luminous points, it is sufficient to open the shutters *B* far enough and to push the plate *A* across until the desired hole comes in line with the centre of the lantern.

Given the constructional details of this lantern, it can easily be seen that whatever position it is in, whenever the observer sights on the light he will also be sighting on the centre of the station mark. Consequently there is no need for a very skilled man to mount the lantern.

It can be perfected by fitting two sighting marks on it.

By way of illustration I would add that in the fifteen determinations of azimuth, using a 2" BAMBERG Universal, with a line of sight not exceeding 1,200 metres (1,312 yds.) I obtained definitive azimuths with a mean error not exceeding ± 0".9.

A HINT WHEN MEASURING THE DIP OF THE SEA HORIZON.

by Dr. HERBERT MICHLER, OFFICER OF THE GERMAN NAVY (RETIRED).

By measurements of the dip of the sea horizon which I had to carry out in the spring of 1933 by order of the *Marine-Leitung*, the unpleasant fact was experienced that, owing to the unequal illumination of the two observed portions of the horizon, the ray of light from the brighter horizon was absorbed continuously by the prism-system of the apparatus for measuring the dip of the sea horizon (PULFRICH type) employed. An accurate contact of the two horizon images was therefore no longer practicable. Nevertheless, in order to obtain in such cases usable measurements, I have applied the following method:

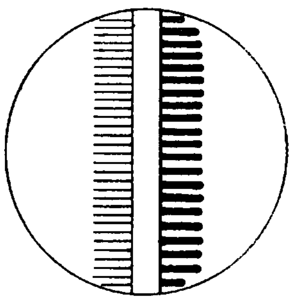


FIG. 1

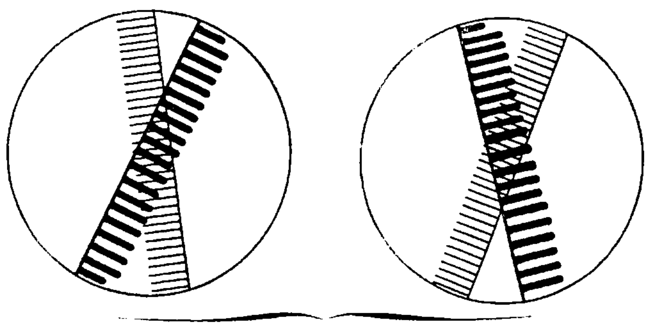


FIG. 2

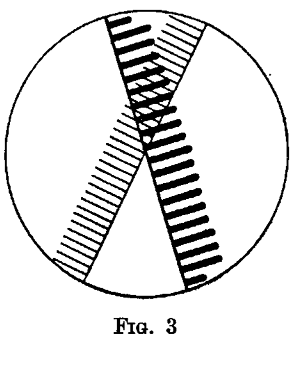


FIG. 3

Both sea horizons are brought closely parallel to each other in the centre of the image field of the telescope of the instrument, so that the only feebly visible horizon is just recognizable by the side of the other one (Fig. 1). The instrument is then lowered and raised; the angles of intersection, despite the previously hardly perceptible horizon, are mostly fairly well recognizable (Fig. 2). Whilst slowly raising and lowering, the setting screw is then turned until the apices of the two angles of intersection coincide (Fig. 3). In this position, with the instrument horizontal, the accurate contact of the two sea horizon images is secured. With a little practice, good results may be obtained by this method, even with some swell on the sea.
