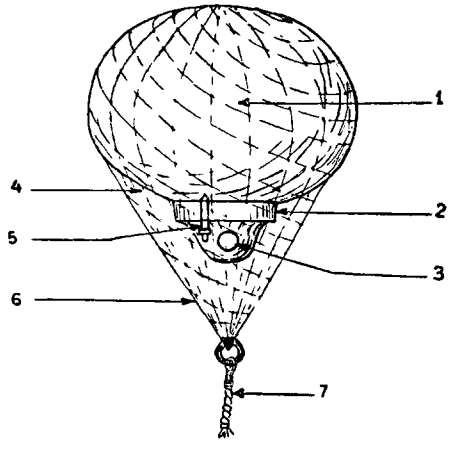
HINTS TO HYDROGRAPHIC SURVEYORS

CANVAS MARK BUOY

The British fishermen in the North Sea use a circular canvas buoy, called a *Pelt*, for marking their nets, and this has been found very useful as a small mark buoy for Hydrographic purposes.



The *Pelt* consists of a canvas sphere 62 inches in circumference with a circular wooden base in which is a hole for securing the mooring rope. In this wooden base is fitted an ordinary non-return valve such as is used for the inner tubes of bicycle tyres and the sphere is inflated by means of the ordinary bicycle pump.

The canvas is well tarred both inside and out to ensure its being airtight and watertight.

In practice it was found that after prolonged use in deep water the wooden base was liable to tear away from the canvas; the whole was therefore covered with a light rope net fitted with an eye at the bottom to which the mooring rope was secured instead of to the hole in the wooden base as originally fitted.

This mark buoy was successfully moored at a depth of 750 fathoms using 850 fathoms of half-inch hemp mooring line and a 28 lb. weight, the *Pelt* floating only half submerged.

By experiment it was found that the *Pelt* will support a weight of 90 lbs. three quarters submerged or of 70 lbs. half submerged.

When not in use the *Pelts* can be deflated and stowed away, taking up but little space.

It was found that if left in the sun after being inflated, the *Pelt* contracts considerably, therefore the air should not be pumped in at too great a pressure.

J. D. N.

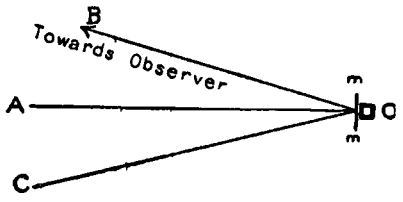
HELIOGRAPHING FROM A MIRROR ON TOP OF A TRIANGULATION MAST

The following method of heliographing from a mirror placed on top of a triangulation mast is taken from Vol. III of the Geodetic Report of the Survey of India 1 Oct./26 - 30 Sept./27 :

A 12 inch circular mirror was fixed on top of the mast on the side facing towards the observer at the other station, and tilted forward at some angle rather less than 45° with the vertical.

To use the mirror as a heliograph all that is necessary is to direct the sun's rays on to the upper mirror by means of a second large mirror on the ground from a point where the observer's station is visible in the upper mirror.

In figure below the mast is shown in plan at *O* and *m m* represents the mirror at the ground from which the observer's station can be seen in the mirror *m m*. First the



position *A* on the ground where one's own reflection can be seen in the upper mirror is found and marked with a peg. Using a plane-table or compass, the line *OB* towards the observer is then laid out. Now, in order to send light to the observer, using the mirror *mm*, clearly the source of light must be situated somewhere on the line *OC* where the angle *COA* = the angle *AOB*. This line *OC* can be easily marked on the ground and also a point found on it from which the horizon is visible. From this position, or very near it, the observer's station will be visible in *mm*. The procedure adopted was for the observer at the other station to shine a powerful helio in the direction of the mast, at a pre-arranged time. The man at the mast having already found or been shown the approximate position from which he should see the observer's station, soon picked up the observer's light (by the method just described). Having once seen it, there was no further difficulty. He adjusted his ground helio at the same place and kept the light of the sun focussed on the top mirror, as long as required.

HELIO BEACON

by COOKE, TROUGHTON & SIMMS LTD.,
ENGINEERS & SCIENTIFIC INSTRUMENT MAKERS,
Broadway Court, Westminster, London, S. W. 1.

The Helio Beacon consists of a dome, on which mirrors are mounted, arranged in a number of series.

The dome is rotated by four wind vanes and the rotation causes the dome to rock so that, with the sun at almost any angle, flashes will be sent periodically to all points about the dome, and thus enable an observer to sight upon it from considerable distances.

The size of the Beacon shown, which is 6" diameter, is intended for shots of 10 miles and over, for which distance the maximum possible error, due to rays being received from mirrors occupying positions to the side of the dome (as viewed from the point of observation) and not in line with the mark over which the beacon has been set up, will be within one second of arc, that is, that permitted in Topographical Survey.

The dome is mounted on ball bearings and is more or less frictionless, so that a very high speed of rotation is imparted to the Beacon with a fairly light wind and flashes are observed in a continuous stream, it being quite an easy matter to take bearings by means of a Theodolite.

A tripod is supplied with the Beacon, the latter being packed in a mahogany case.

The Beacon is made entirely of rustless materials.

The price of the instrument complete is £ 40. 0. 0.

DETERMINATION OF THE SHIP'S POSITION BY OBSERVATIONS OF TWO POINTS THE BEARINGS OF WHICH INTERSECT AT A SMALL ANGLE.

This problem relates to cases where, on making a land fall, two objects only are visible, the angular distance between them being small and therefore the lines of bearings