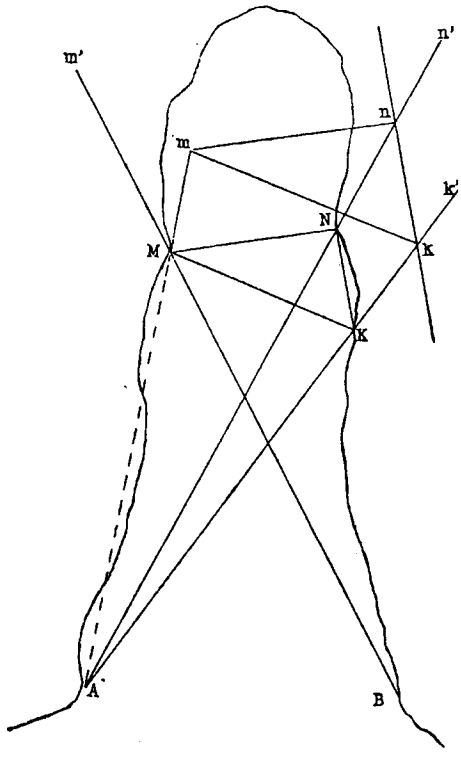


Next set the table up at the flag *K*, orienting on *A*. Then draw a long orienting line toward the flag *N* at any convenient place as *kn*. It must be kept in mind that the intersections *k* and *n* of this line with *Ak'* and *An'* are not the actual points *K* and *N* on the sheet, for *K*, the place of set-up, has not been located.

Next set up the table at the flag *M*, orienting on *B*. Resect upon the flags *N* and *K*, using the arbitrary points *n* and *k* as the corresponding points on the sheet. This gives a location of *M* at some point, as *m*, not on the line *Bm'*. But, as a matter of fact, the point *M* really lies on the line *Bm'*. Now with the fiducial edge, draw a line from *A* to the arbitrary point *m*. (This is not an observed line for *A* and *M* are not inter-visible.) The point *M*, where *Am* cuts *Bm'*, gives the true location of *M* upon the plane-table sheet.

Next sight upon *N* and *K*, locating them by intersections with *An'* and *Ak'* from the point *M*; the check, then, is the parallelism of the line *KN* with the orienting line *kn*. Or, locate *N* by an intersection from *M* with the line *An'*; construct *NK* parallel to the orienting line *nk*, locating *K* by its intersection with *Ak'*; then check by a resection upon *K* from *M*. The geometric proof is obvious.

CANVAS CURRENT DRAG

by REAR ADMIRAL J. D. NARES.

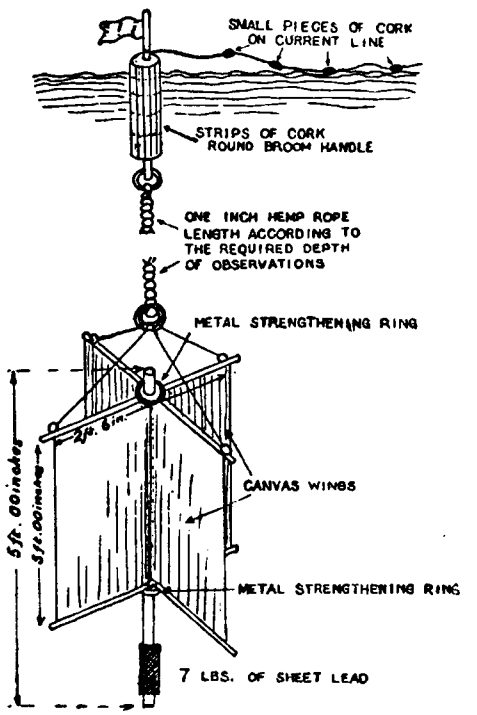
The attached drawing shows details of a Canvas Current Drag used by the writer in H. M. S. *Merlin* when carrying out a long series of current observations in 1920. It was designed on board and constructed by the ship's carpenters and when tested with the EKMAN Meter was found to give very accurate results.

The apparatus consists mainly of two surfaces of canvas each 3 ft. 0 in. long and 2 ft. 6 in. wide stretched at right angles to one another by means of wooden spreaders. The centre stave is of wood, one inch square and 5 ft. 00 inches in length — round the bottom end of which is secured a 7 lb. weight of sheet lead. The wooden spreaders are of slightly smaller dimensions than the centre stave and just strong enough to keep the canvas wings flat when wet.

The "Float" consists of a broomhandle, round which are lashed sufficient strips of cork to just support the Drag (*) with only the top of the Float above water, to which is secured a small white flag and also the end of the Current Line.

The "Current Drag" is suspended from the Float by means of a hemp line one inch in circumference, the length of which can be varied according to the depth at which the observations are required.

(*) *The Float should be as small as possible in circumference in order that it will not be affected by the wind or form a check to the movement of the Drag, should the strength and direction of the current at the depth at which the observations are being taken be different to that at the surface.*



The "Current Line" can be constructed of any light rope, but a plaited line similar to that used for Patent Log lines but of smaller diameter has been found to be most suitable as it is strong and does not tend to shrink or kink. Small pieces of cork should be secured to the Current Line at short intervals to keep it on the surface of the water. The first 100 feet or so of current line should be kept blank as a "stray line" to allow the drag to float well clear of the eddies astern of the ship or boat before the observations are commenced, and a white bunting mark then inserted. At distances of one hundred, two hundred, three hundred, etc. feet from the white bunting are inserted marks consisting of one, two, three, etc. knots; at each intervening 50 feet yellow bunting, and at every 25 and 75 feet blue bunting marks.

The drag having been lowered into the water and allowed to float clear of the ship or boat, the exact time is taken when the white mark on the current line goes out, the drag is then allowed to float with the current for one, two or three minutes according to its strength; at the end of which time the exact amount of line run out can be measured by means of the knots and coloured marks, the rate in knots of the current being thus determined.

Thus if 258 feet of line runs out in one minute the strength of the current is 2.58 knots, or if 420 feet runs out in two minutes the strength is $\frac{420}{200} = 2.10$ kts, etc.

The current line must be paid out at just sufficient speed to keep it straight along the surface of the water but without checking the speed at which the drag is drifting.

The direction in which the current is setting is determined by taking a compass bearing of the white flag on top of the Float.

It is advisable to have a small line fastened to the weight at the bottom of the Drag and stopped to the top to assist in lifting it inboard and to prevent an undue strain coming on the centre stave.

HYDROGRAPHIC SIGNAL WITH TRIANGULAR CROSS-SECTION

by

H. A. PATON & W. F. DEANE, U. S. Coast and Geodetic Survey.

(Extract from the *Bulletin of the Association of Field Engineers*, U. S. Coast and Geodetic Survey, Washington, June, 1931, p. 91).

While considering the type of hydrographic signal to be constructed for the survey of the entrance to Port Royal Sound, S. C., by the party on the *Natoma*, C. A. Egner commanding, it was found that a tower with a triangular cross-section could be built with a great economy of labour, material and time, and, at the same time, add appreciably to the visibility.

By using a right triangle cross-section and orienting it so that the bisectrix of the right angle pointed through the center of the working grounds, the visibility was greatly aided. With targets on the equal sides of the triangle, the tower had more value as a left hand or right hand object for sextant fixes without appreciably reducing the size