The length between girders, top to bottom, is 4 feet. Thus the diagonals can also be cut economically from stock lengths of 1" × 4" lumber. For example: 3 5.66-foot diagonals could be cut from an 18-foot 1" × 4" piece, 2 6.95-foot diagonals from a 14-foot length, and 1 6.95-foot and 2 5.66-foot diagonals from an 18-foot length.

The legs or uprights are framed to accommodate the nailing on of girders and diagonals with the maximum strength possible. One leg, at the right angle, is made in the usual manner by nailing 2 2" × 4" pieces together to make a 4" × 4" section. The other two legs are built up by nailing 2 2" × 4" boards together in such manner as to have a 2" overlap. This overlap gives an even surface to nail to and if nails be driven into both pieces, the connection will be strong. All legs are framed with a 2 - 2" × 4" section with an initial 8-foot piece of material to allow for a sufficient overlap. The length of the splices used was 3 feet, or, in cases where odd lengths of 2" × 4" boards were used, the splices were smaller. 1" × 4" boards are recommended for splices in all cases as the joints are then sound enough.

Double diagonals were used for each bent for 4 bents, then single diagonals were used.

By reference to the drawing, it will be noted that the lower 6 feet of the signal were buried in the ground with the footing used as shown. This footing of 1" × 12" boards on 2" × 4" boards is recommended, as no danger is introduced because of lack of perpendicularity.

Twenty 8-gauge guy wires were used and found satisfactory. Some issue might be taken to the large number of guys, but from the experience derived from the building of this signal, the additional amount of wire insures a 45° angle or greater between the ground and the guy, the resultant force caused by wind putting tension on the guy was more successfully coped with. Four guys were used at the juncture of the tenth and eleventh bents, 8 at the fifteenth and sixteenth, and 8 at the twentieth and twenty-first. It is desirable that the guys be made fast to the tower and led out in such fashion as to be perpendicular to a side of the cross-section. The customary "deadmen" were used for anchor where trees were not available.

In usual practice, the target boards, 60 - ½" × 6" × 16', would be nailed to the long side or hypotenuse of the triangle. However in this case, to insure the visibility heretofore discussed, the targets were cut into two pieces of 8 feet and nailed on the 4-foot sides of the tower. This also eliminates the use of wings as braces.

The simplicity of the design lends itself to adaptation to signals of any height up to a maximum of about 100 feet. An additional advantage is realised in using the triangular cross-section in preference to the rectangular, because of the smaller amount of twist in the former.

THE "BANNER" METHOD OF ATTACHING A FLAG TO A BEACON

by REAR ADMIRAL J. D. NARES.

All surveyors must have expended much weary time and eye strain trying to obtain angles to distant beacons on days with no wind, when the flags marking them were hanging "up and down the mast".

It was in 1920 while carrying out a survey off the coast of Sierra Leone, W. C. Africa, where day after day there was little or no wind, that the following method of attaching flags to the floating beacons in order to make them more visible was used and found to be most successful.

The flag was suspended in the form of a "Banner" from the head of the beacon spar, as shown in Fig. 1, a light bamboo being used as a spreader, suspended at its centre by a 2 ½ foot length of 1 ½" rope attached to head of spar.

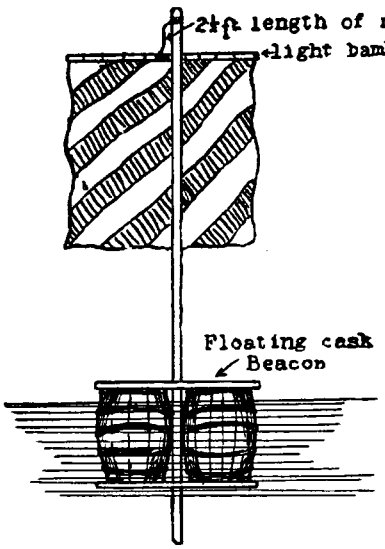

Fig. 1

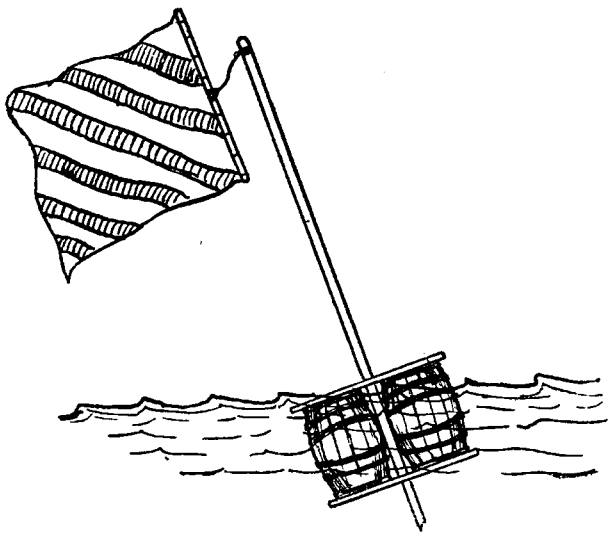

Fig. 2

On days with no wind the flag will hang as shown in Fig. 1 and the movement of the Beacon due to the action of the sea will be sufficient to prevent its hanging "edge on" to the observer for any length of time.

On windy days the flag will blow out as shown on Figure 2, and thus be as visible as one secured in the usual manner direct to the spar itself.

The extra weight of the bamboo spreader can be compensated for by having a slightly smaller sized flag than would otherwise be necessary.

NOTE. — The centre of the bamboo spreader should be parcelled with canvas to prevent chafe between it and the beacon spar.

The above idea occurred to the writer by observing that on a flat calm day when the ship's Ensign and Jack were hanging up and down their staffs and therefore very difficult to see, the ship's company's washed clothes hung out to dry, being suspended at each upper corner from the clothes lines, were clearly visible for a considerable distance from the ship.