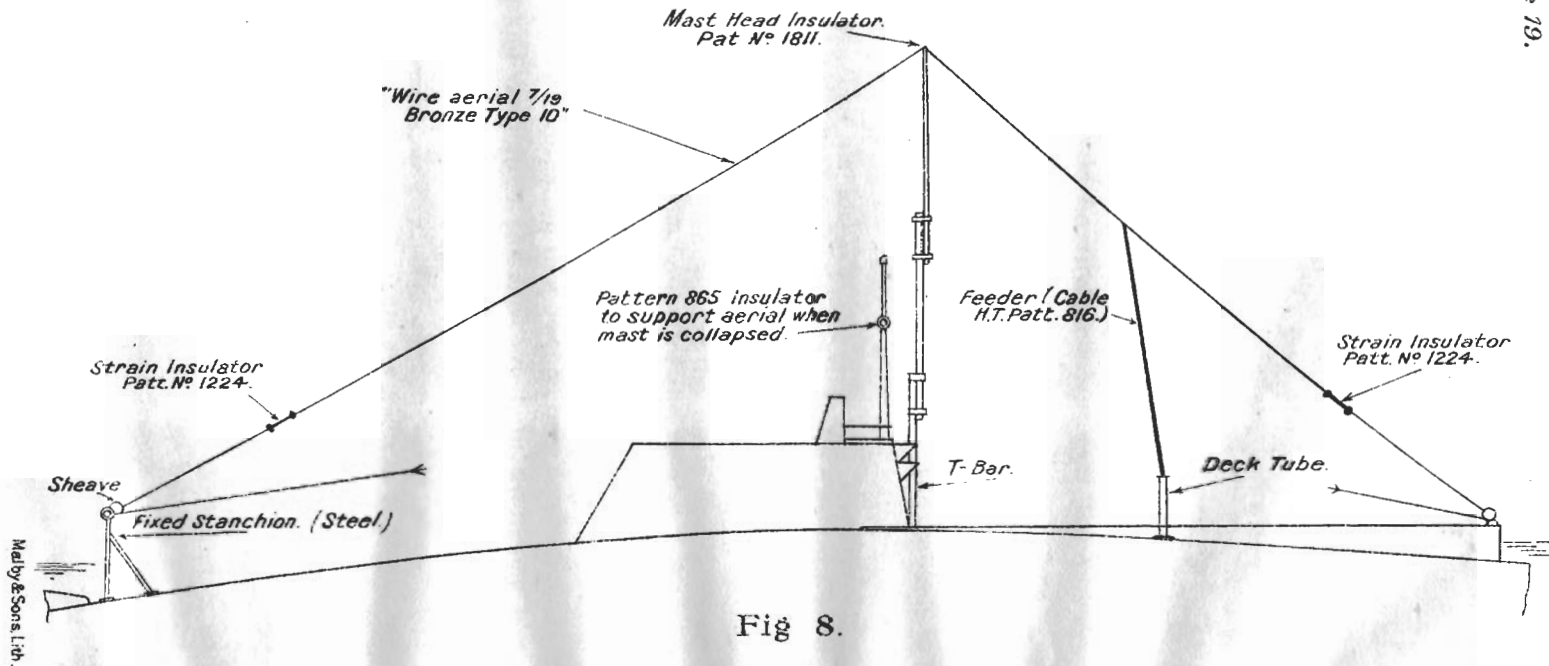


TYPICAL RIG AND EXTERNAL FITTINGS.

SCALE $\frac{1}{2}$ " = 1 FOOT.

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CHAPTER V.

RIG AND DECK FITTINGS.

Fig. 8 shows the typical rig at present approved for submarines.

The mast is of the type known as a "Collapsible Mast," because it collapses vertically down into the superstructure of the boat for diving purposes. The standard height for this mast is 30 feet.

The mast shown in the sketch is called a "two-throw mast," as it collapses in two sections, the lower section sliding up and down a fixed "T" bar, and the upper section sliding up and down the lower section. In certain boats it is necessary to fit a "three-throw mast," because with a "two-throw" mast 30 feet high it is not always possible to stow the truck low enough to clear the sight line of the periscope.

The masts are made of Norway pine and are fitted complete without an aerial by the dockyard. The design is such that when the lower section is hoisted from the collapsed position the other sections are all hoisted automatically by the movement of the lower section.

The area is insulated from the mast by means of Pattern 1811 masthead insulator, which is fitted in place by the dockyard who fit the mast.

The aerial itself is to be fitted by the ship's staff.

For the present it is the policy to leave Commanding Officers of Submarines a free hand as regards the type of aerial they use, and the method of working it, so long as the ordinary technical requirements are fulfilled.

The aerial shown in Fig. 8 has been adopted in several boats, and is considered the most suitable of those tried up to the present.

It consists of stranded bronze wire (7 parts of 19 L.S.G.), and is used singly both before and abaft the mast.

The feeder used with this arrangement of rig is "Cable high tension Pattern 816."

The great advantage of this arrangement is that boats can signal up to a limited range with the mast collapsed. For this purpose, as soon as the mast is collapsed the aerial should be hauled taut by means of the lines shown in Fig. 8. Also an insulator (either Pattern 1811, masthead insulator, or Pattern 865, upper insulator for aerial fittings, Type 5) should be fitted on the side of the periscope bracket for supporting the aerial wire and preventing it touching earthed objects when the mast is collapsed.

If some other form of aerial is fitted it should be remembered that the size of the aerial is limited by the minimum wave-length to be transmitted, viz., 6.2 L.S. (*see* Chapter VII.).

In general, with regard to the aerial, the following points should be borne in mind :—

- (1) The greater the length of the aerial the greater will be its L.S. value.
- (2) The greater the mean height of this aerial the greater its radiation power. The radiating power also depends on the length of the aerial, and in a multiple wire aerial on the horizontal area it covers.
- (3) The better the insulation of the aerial the greater the efficiency. Therefore remove salt and dirt from all insulators whenever practicable, and do not let flags foul the aerial or feeder.
- (4) The lower the ohmic resistance the greater the efficiency of reception. A bad contact will choke off faint signals altogether.
Therefore do not tolerate dirty or loose contacts, and use a low-resistance conductor as a feeder.
- (5) The position of the aerial relative to the hull and super-structure affects materially its capacity, and hence the tuning. Therefore fit the aerial so that when it is spread it will always take up the same position relative to the boat.

Experience will show which is the most serviceable and efficient type of aerial to use, and reports from sea on the subject, giving full details and results obtained, are required in order that the rig may eventually be standardised. Arrangements are being made to add to the establishment 100 yards of wire aerial $\frac{1}{8}$ bronze, Type 10, instead of the 400 yards of Pattern 1082 aerial wire allowed at present. Arrangements are also being made to reduce the number of Pattern 1224 strain insulators allowed by establishment from eight to four, and add in lieu two Pattern 865 insulators upper for aerial fittings, Type 5.

When first fitting an aerial make it rather longer than it is anticipated will be required ultimately, and, after taking measurements of its L.S. value, reduce the length as necessary from the lower end.

The lead of the feeders should be as short, direct, and clear of earth as practicable. The feeders should be soldered well into the connections at the top of the deck tube. The upper end of the feeders should not on any account be soldered to the aerial, but the wires should be well scraped at the joint, layed up tightly together, and served over with copper binding wire.
