Make Your Aerial Fully Efficient

Concluded from last week

IN concluding our first instalment last week we summarised the ideal aerial as follows: It is at least 40ft. high, 60ft. long, and well insulated, clear of earthed objects. Stranded wire is preferable, and multi-wire aerials have little in their favour.

This week we shall go on to consider a few practical points that crop up when the aerial is being erected. The amateur who is about to purchase the whole of his aerial equipment should adhere to the following:—

100ft. aerial wire, 7/22 enamelled.
50ft. of lead-in wire of the same quality.
Six insulators; the large shell type, small egg, or glass.
One lead-in insulator.
One lightning arrester (this is important).
50ft. of guy wire, galvanised stranded.
Two pulleys.
One lead-in insulator for the earth wire.

Choice of Situation.

NEXT consider the situation for your aerial. In the country, this will be an easy matter, but in the town, it will be decided by the shape and aspect of the section. You have read what has been stated about direction in last week's issue, and from this it can be decided whether it will be worth while running the aerial in any special direction. Next look for a position that will be well clear of trees, roofs, and earthed objects, since, as we have said in our first article, these lessen the effective height, and militate against the efficiency of an otherwise good aerial.

When power lines pass close to the section, place the aerial at right angles, and take the lead-in from the end most distant from the lines. If power lines run across the section, they must be absolutely clear of the aerial. See the regulations of the Fire Underwriters previously published.

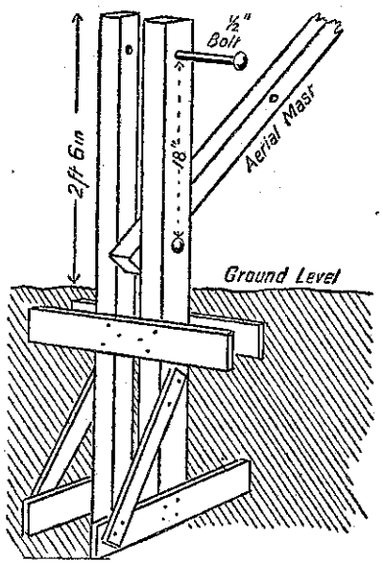
Aerial Masts.

GOOD masts are an asset not only to reception, but to the property on which they are erected. Clumsy and poorly-stayed masts rarely give satisfaction, especially ins climate where the wind is strong, as they are liable to give trouble by coming down at a most inopportune moment. The chances are that they will break when doing so. Those who do not wish to take the trouble of obtaining their own masts can secure excellent ones commercially made. These are usually fairly light, and are easily erected. It is imperative that they should be well stayed, for if they come down, they may be badly broken.

Another very popular type of mast is one made from several lengths of galganised pipe. Start at the bottom with about 20ft. of 2in. running to 1½in. and then to 1in. Reducing sockets can be employed, and the stay wires must run from immediately above each socket. Great care must be taken in erecting this type of aerial, for the pipes are heavy, and if any strain is put on the joints they will break. It will be necessary to have quite a number of helpers on the job, and as the aerial is lifted into position the end should be supported by a ladder, which is gradually brought into the erected position. The stay wires can either be tried round the mast with fairly heavy cotton to keep them from tangling, or can be brought out and used to aid in the erection of the mast.

Wooden Masts.—A good mast can be made from 4 x 2 and 3 x 2 timber. For the first twenty feet, use 4 x 2, then taper to the 3 x 2, but provide at least two sets of stays, one set of four at the very top, and the next set at the join. If these are insulated, by egg insulators near the mast, and near the ground,, so much the better. A diagram is given, showing how a good base can be made, allowing the aerial to be collapsed merely by removing the bolt, and slackening the stays.

Trees form good aerials, especially if high, and not subject to extreme swaying in the wind. The stem of a gum tree can very frequently be employed



with an extension either of timber or piping. If the tree is likely to sway even slightly, the halyards should not be rigidly fastened, but must be weighted with a window sash or even two, so that the swaying mast will not increase the tautness of the aerial.

It is often convenient and sometimes imperative to use the chimney as one mast. This is not a particularly good practice, as, unless care is taken, the aerial wire will cut into the mortar between the bricks and loosen them. Furthermore, it is bringing the aerial over a roof or at least near to a roof which means loss in efficiency. Where this cannot be avoided, a short piece of timber which carries the lead in clear from the roof must be utilised. Furthermore, a galvanised iron band should be mounted round the chimney, wide enough to prevent friction on the mortar. This was shown diagramatically in our last issue.

Staying the Aerial.

A SET of three stays should be attached to every 10 or 12 feet of mast: every 10 if the mast is a light one. One set of stays must be immediately behind the aerial wire, i.e., the aerial and the back stays are in the same vertical plane. The other two stays are set at an angle of 120 degrees, i.e., the circle round the mast is divided into three equal portions. Many amateurs who are keen on obtaining the very maximum in signal energy from their aerial put insulators in the stays, but this is not necessary for the average aerial.

The stays should be securely fastened to stakes driven well into the ground. Usually, if lengths of piping are used as stakes the hammering necessary to drive them in turns over a shoulder which will prevent the wire from slipping. When wooden stakes are used, it will be necessary to cut a notch to hold the wire. The length of stake will, of course, depend upon the nature of the ground into which it is driven.

The Lead-In.

DIAGRAM 2 indicates the method of securing the aerial wire to the mast. A pulley is attached to the top of each mast and through this the halyards are passed. The insulators are strung on these. Three insulators are attached to each halyard, and to the last of each the aerial wire is attached. Where a short aerial is required, make the lead-in continuous with the aerial, that is, wrap it round the last insulator as is indicated in the diagram. Very many aerials are erected with only one halyard, but this is unwise, as the aerial will sometimes snap close to the end without one, with the result that the pole has either to be lowered, or scaled, to effect repairs. It is better to be sure than sorry.

Where the lead-in is not continuous with the aerial, it must be soldered to it. Thoroughly clean a few inches of the aerial and lead-in. Bind the two together with fine wire (approximately 22 gauge), and then with a big iron run in some solder until a firm joint is made. If soldering is inconvenient, a joint of approximately six inches in length should be made, and this joint should be tightly wound with electric tape to a point extending an inch or two beyond the joint proper.

One of the wall insulators should be fastened in the top of the coping at the edge of the building where the lead-in wire is going to be brought down the side of the building. If possible, it is advisable to utilise one of these wall insulators at a distance of about every twenty feet of the lead-in length. This is necessary because of the fact that in wet weather the brick wall makes a much better ground than in dry weather, and any slight swinging of the lead-in wire tends to change the capacity of the aerial, with a corresponding difference in the tuning. This might produce a slight fading effect of signal strength in wet weather.

The method of bringing the lead-in to the set will depend upon circumstances. The writer has never found it necessary to drill holes through the wall. This is, in some cases, an excellent practice from the wireless point of view, but one which is strongly condemned by the less enthusiastic members of the family. On the market there are flat strips of copper with a terminal at each end, to which the external lead may be attached. Two of these serve admirably for aerial and earth, and can be fastened underneath the window without any difficulty.

A correspondent this week sent a sketch of his aerial eequipment showing a very ingenious lead-in support. Some distance from the wall he had sunk a post into the ground, and to it