a square of ebonite to hold the sockets, this being screwed to the side of the A solder-tag is placed on each pin, and all wires come through a hole drilled in dial knob, and are soldered One pin should be out to the tags. of regular position, so that the plug may only be inserted correctly. Flexible metal gas-tubing is used to contain the cabled wires leading to the receiver. This tubing should be earthed, and in case of being unable to procure a seven-way plug, then instead a sixway plug, could be used, with an extra loose pin, to connect B- to earth.

From the back of the baseboard emerge the twisted flex leads for mains at and A.C. valve heaters.

e lower portion of the container is merely a wooden box to hold the condensers, the front and back being of 7-8 rimu and the remainder 3-8in. The lid, which forms the baseboard. is strengthened by screwing neath two strips of lin. by 1. under The whole should be firmly screwed together and may be lined with tin, though this is not essential. The cover and front flap are made of strong tin or thin sheet-iron, the heavier the better, and both metal and wood parts of the container are coated with black Sapolin. If a coat of shellac is first rubbed into the wood, a bright finish will be imparted to the Sapolin.

The top of the cover should not be much less than one inch above the transformer core, or a vibratory hum my be imparted to the cover. A strip of 24's copper sheet bent to L section and bolted inside the top of the cover will cut out any slight hum that may

Constructors who have built a small eliminator will find that in handling the higher voltage and greater current there are more chances of trouble that must be watched.

The dimensions of the original are given, but may be altered at the outset to suit components. The condensers should all be purchased before deciding upon the size of the lower containers.

In the original the condensers used were T.C.C. 4 mids, of 800 volt test. and Western Electric 2 mfds, of 500 Any reliable makes of volts test. condensers of not less than the same

an old bakelite dial for the pins and 2 x 5 5-8, this latter dimension including are attached by short screws to ing the terminals. Some condensers the clamps under baseboard, leaving a have projecting lugs for screwing to in. space for connections. a baseboard, but as these will not be transformer an extra piece of lin. strip required, any that interfere with compact stowing may be cut off.

The baseboard is hinged to the front of the condenser container, allowing of instant access to the condensers at The total inside height any time. of this container should not be less than three inches, which allows for the 1in, strips under baseboard, and a space above the 2in. condensers for leads.

All leads from the upper to the lower portion are taken through the baseboard at the front, where the hinges are placed, so that they will not interfere with the free movement of the baseboard when lifted.

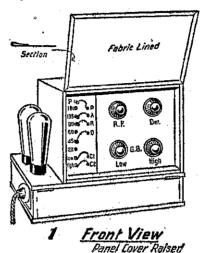
The baseboard may measure  $14\frac{1}{2}$  by  $10\frac{1}{2}$  inches, allowing 1-8in, overhang all

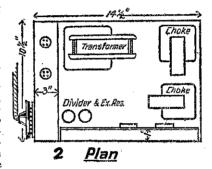
The diagram shows how a wooden frame is constructed from strips 1 x 3-Sin., and screwed to the front of base-The panel is screwed to the hoard. back of this frame, and the front flap is hinged to the top, either by means of brass hinges, soldered to the flap, or by a hinge made by cutting the top edge of the flap, and a strip of tin with corresponding spaces, the projections being curled over a piece of 14's wire to form the hinge.

The flap should project 1-8in, beyond the frame at each side, and about in below top of baseboard at lower edge. Edges of flap and cover should be turn ed in, and a layer of cloth or other insulator secured to the inside of flap, so that when holding it up with one hand and altering tappings with the other, there will be no chance of receiving a shock if a connection is accidentally touched. A good rule with eliminators is always to turn off the supply current before making charges. The flap and cover are connected to B , the cover by resting upon the metal tray, with edges turned up half an inch. forming the floor upon which the transformer and chokes are to rest. This tray may be of brass, copper. aluminium, or any other non-magnetic metal, in order to avoid hum from the The tray also connects stalloy cores. -, and is attached to the baseboard with lin. screws.

When all connections have been made test and capacity may be used. The under the baseboard, a sheet of stout

sculty they can be constructed, using space occupied by the T.C.C. is 2 x cardboard and then a square of sheet should be secured, so that the board and iron may be attached to it with additional screws in order to prevent any chance of hum from the transformer core. Before putting the clamps on they should be drilled or grooved side-





ways, where required, so that filament and plate leads may be passed through the holes.

The container as described makes a very suitable housing for an eliminator purchased in "kit" form, being greatly superior in appearance and convenience to the "breadboard" style of construction.

## MATERIALS REQUIRED.

72 doz. 14in. stalloy strips (3ft.). 14th, 32's s.w.g. enamelled wire.

14lb. 24's s.w.g. enamelled wire. 4lb. 30's s.w.g. enamelled wire. 13lb. 18's s.w.g. d.c.c. 4 lengths 3-16 threaded rod and 16

4 iron clamps. 🟲 Rectifier sockets (unsprung U.X.). 12 pins and sockets.

1 voltage divider (sometimes known as tapped resistance). extra do. or 12,000 ohms resistance.

potentiometres, 400 olims. 4-mfd. condensers, 800 test. 5 2-mfd. condensers, 500 test.

7-way plug and cable. Sheet iron, bolts, screws, flexible wire, fibre, spaghetti, washers, timber,

tane.

#### The Transformer.

THE core of the transformer is constructed of strips of stalloy 14in. wide, built to 1 3-8in., so that the wooden former will be 14 by 1 3-8 by Sin., the latter being the outside length of spool. The 14 dimension length of spool. must be a shade over, so that the stabloy will slip in without forcing, spool ends are 3½ by 3½in., which gives an even depth all round. The long piece of stalloy is cut 5 1-8in. and the short piece 2 5-8in., but the latter would be slightly increased if any constructor finds it necessary to provide a greater number of windings than are specified. The stalloy may, of course, be cut up by the constructor, or ordered to be cut by a supply house, where this service is undertaken. Every piece should be shellaced on both sides after cutting.

Details of transformer building are fully dealt with in the "Listeners" Guide," so only necessary extra particulars will be given here.

Before commencing winding, strips of medium weight uncreased brown, paper must be prepared to place between every layer of wire. Between every separate winding place not less than one layer of overlapping tape and two thicknesses of brown paper.

The wide strips must be a fit for the inside of the spool, 3 9-16 in the original. About 20ft, length of this will suffice for the primary and hetween other windings. The narrow strips for the secondary will be a bure 13, which should leave a space of 1-8in. between the two secondaries. About 40 feet of this width will be required.

When assembling the laminations, and the centre of the spool is getting full, slip in a strip of tin 1 1-8in. wide,

### (Continued from page 4.)

guard the plant and see that purely mechanical equipment functions properly. The entire staff consists of only sixty persons. The enlargement of the station made possible a very considerable increase in its efficiency. This is due chiefly to the improvement of the short-wave transmitter, which makes possible the transmission from 150 to 200, and under special circumstances, as many as 300 words per minute.

The latest stage in the advance in wireless communication was the introduction at the end of last year wireless telephony with Aires, a distance of some 7300 miles. This service is to be extended to cover the entire Argentine and also to other South American stations. And the next step will be the transmission of pictures, which now, after long experimentation, is about ready for practical

### Indoor Antennae.

FROM the point of view of reception, the indoor aerial is better than a loop antenna. The pick-up of the latter is small, and, in consequence, an extra radio-frequency valve is usually necessary to compensate for this. An indoor aerial, on the other hand, while not possessing the sensitivity of the outdoor arrangement, is nevertheless capable of giving good results, especially on the higher frequencies. It is as well to carry out experiments with indoor aerials of various types, since the disposition of the wires frequently has a marked effect upon signal strength.

## Home Construction.

THE wiring up of a receiver will be found a great deal easier if the components are prepared before they are mounted. This is done by filing clean and tinning all soldering lugs and other points to which connections are to be made.

"blob" of solder should be placed on each lug. This will be sufficient for making the connection and it will not be necessary to add any more while

# Working Moulded Ebonite.

SHARP drills are essential for working moulded ebonite, and the smallest possible pressure should be applied. When it is necessary to make a hole through a thin moulded flange through one of the ribs of a ribbed coil former, it will be found safest to make preliminary hole without a drill. Take a fairly stout needle (it need not be sharp), heat it red hot and push it through the ebonite, holding it in a pair of pliers. It will be found necessary to withdraw the needle and re-heat it several times before the hole Finally, if a moulded is complete. ebonite component is to be screwed to the baseboard of a receiver, avoid After tinning a small screwing the component down too tight-

ly as moulded ebonite sometimes behaves like porcelain, splitting if the least bit too much pressure is put on a weak point.

## An Earthing Precaution.

MANY amateurs use two earth contacts of different kinds under the impression that such an arrangement gives better results. If a copper and a zinc plate are buried in different positions and connected, an electric cell with its two plates of dissimilar The electrolyte is metals is formed. composed of the moisture and acid in the soil and the outside circuit consists of the earth leads. A microammeter (or even a milliammeter in some cases) placed in one of the earth leads will indicate a flow of current, and this current can be produced only by disintegration of one of the plates. Further, such an arrangement quite possibly be the cause of background noises in a sensitive receiving