foil lap over one another (1 inch by ½ inch in extent) by ¼ inch on all sides. A reference to fig. 2 will make the matter clearer.

The coupling condensers, being of considerable capacity, would involve too bulky a component if only two conductors were used, so here we use a total of 21 foil "plates," the width of these being ¾ inch instead of ½ inch, the width of the mica (or paper) sheets separating them being likewise increased to 1¼ inches so as to avoid any possibility of two adjacent "plates" touching. Starting from the bottom of the assembly, plates 1, 3, 5,

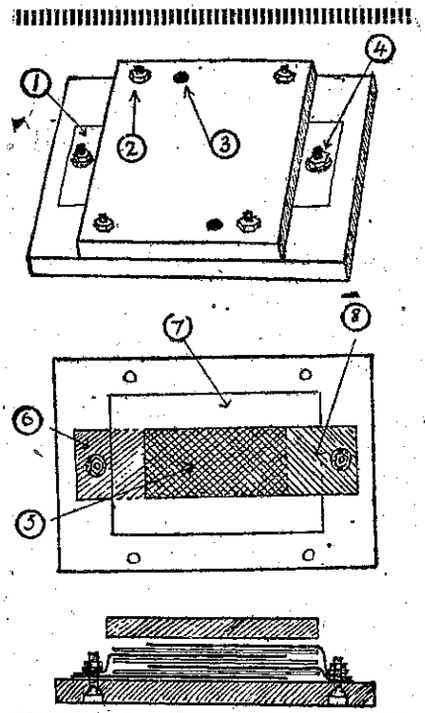

FIGURE 2.—FIXED CONDENSERS.

1. Projecting ends of tinfoil.
2. Clamping bolt.
3. Hole bored through both pieces of ebonite for screwing to baseboard.
4. Screw and nut for connections, washer under nut to protect tinfoil beneath.
Centre Diagram.—Plan of grid condenser before positioning of top clamping piece.
5. Area where tinfoil sheets overlap with mica sheets between.
6. Tinfoil (bottom sheet) under mica.
7. Mica separating tinfoil sheets.
8. Tinfoil (top sheet) above mica.
Lower diagram showing the method of assembling the coupling condensers with mica sheets, insulating the tinfoil "plates" one from the other. Only four of the total of twenty-one "plates" are shown.

7, 9, 11, 13, 15, 17, 19 and 21 will be connected to one end of the condenser and plates 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 to the other end; each plate must, of course, be carefully insulated from both its neighbours by sheets of mica arranged in just the same way as in the case of the grid condenser.

A portion of the assembly is shown in fig. 2, this also serving to show the manner of clamping all the projecting ends of foil at each end with a little bolt to hich the connecting wires are ultimately also joined; a washer is placed immediately above the foil (this is particularly necessary if tinfoil is used) to prevent its being torn when the nut is tightened. It will no doubt be obvious that, although holes for screwing the coupling condensers flat on the baseboard are shown in the diagram, the exigencies of space will necessitate their being mounted edgewise, in which position they may be supported by the connecting wires; the mounting holes will probably come in handy eventually when the condensers are used in some other piece of apparatus.

Resistances and Grid Leaks.

THE making of the resistances and grid leaks is even more simple, and since wire-wound resistances such as will eventually be used for coupling the first audio stage are expensive, their construction is advised in all cases. Both resistances and grid leaks are cut out of blotting-paper which has previously been drenched with Higgins' Waterproof American India Ink and dried; inasmuch as this ink is a trifle expensive, it will be well to stage, either in person or by a friendly proxy, a slight accident at the office whereby the bottle of India ink is spilt over a nice clean sheet of blotting-paper which is subsequently surreptitiously dried and secreted. As a last resort, 1s. 6d. may be expended on a small bottle of the ink, but be sure to obtain the kind specified.

Fig. 3 gives the dimensions of the pieces of prepared blotting-paper required for the various components also showing the method of mounting on a ¾-inch strip of ebonite; a two-inch length of the strip will suffice to mount a gridleak, a resistance necessitating a three-inch length. As a very temporary job, the mounting strips may be dispensed with altogether, the strips of prepared paper being simply screwed down to the baseboard (which must be thoroughly dry and not of totara), with small brass woodscrews, under the heads of which the connecting wires are secured, a washer being disposed between the wire and the prepared paper to protect the latter. It will be found that the paper is rather apt to tear, some little care in handling it being necessary.

Tuning Coil.

THE only component remaining to be dealt with is the tuning coil. The constructor can please himself whether he cuts costs on this or makes a permanent job of it. A little expenditure in making a good job will not be wasted, as the original coil can then be shifted so as to tune the grid circuit of the high-frequency stage when this is subsequently added.

If it is intended to construct the coil, once and for all, a 3½-inch length of ebonite or formica tubing of 3-inch diameter should be procured; the thin purse should be temporarily stimulated by using a similar piece of cardboard tubing or by making a tube by winding several layers of varnished paper on a suitable former—the paper tube is subsequently baked in a warm oven, for which operation a time should be chosen when the rest of the household is away from home.

The winding is the same whether the coil is temporary or permanent, but depends on the capacity of the variable condenser with which it is to be tuned. Where the condenser is to be bought, it has been already suggested that it should be of .0003mfd. maximum capa-