

Disc Condenser (Variable).—The variable condensers mounted on the multiple tuner are of the most compact form in existence, a variable capacity up to ten jars, or 10,000 centimetres, being contained in a flat cylinder 4 inches in diameter, and $1\frac{3}{4}$ inches in height. The conductors consist

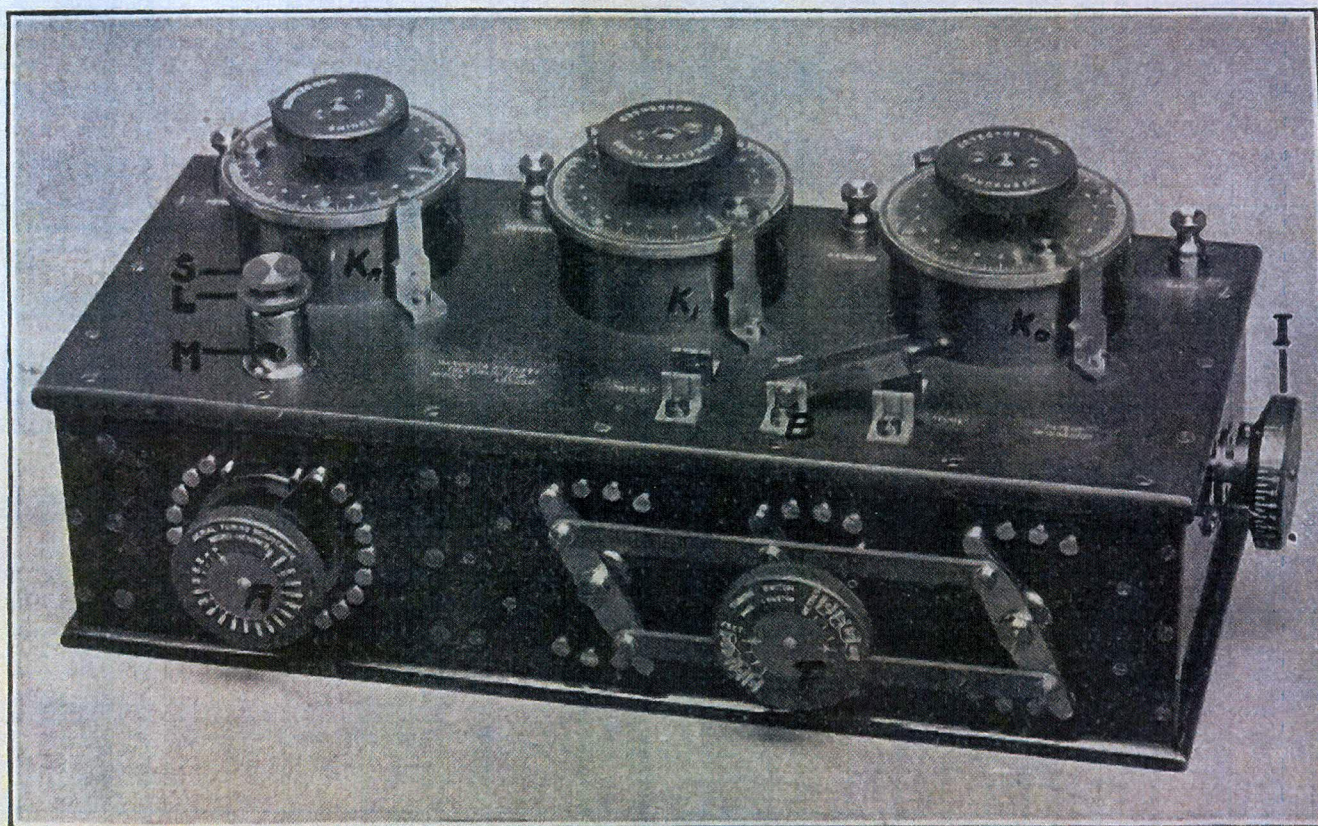
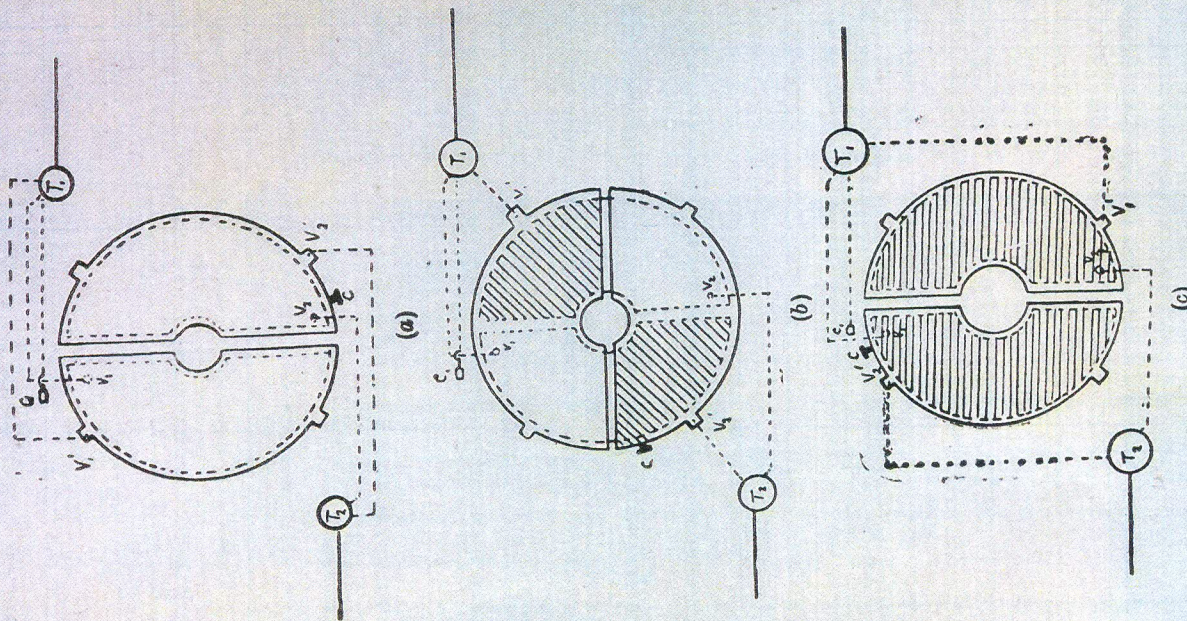


FIG. 176.—MULTIPLE TUNER.

A, Aerial Inductance Handle.—B, "Stand by" Change-over Switch.—I, Intensifier Handle.—K_A, Aerial Condenser.—K_I, Intermediate Condenser.—K_D, Detector Condenser.—L, Lock Nut.—M, Micrometer Spark-gap.—S, Adjusting Screw.—T, Tuning Switch Handle.

of two sets of interleaving zinc vanes, and the dielectric consists of a number of thin circular sheets of ebonite. In each set, half the vanes are held in a fixed position in the container, whilst the other half are all capable of being turned through 180 degrees, by the movement of an ebonite handle mounted on the top of the cylindrical container. Figs. 177 (a) (b) and (c), show the disposition of the movable vanes with respect to the fixed vanes, for capacities of zero value, half the total value, and the total value respectively. T₁ and T₂ are the main terminals of the condenser, the former being permanently

connected to the movable vanes at V'_1 and to the fixed vanes at V_1 while the latter is connected to the movable vanes at



FIGS. 177 (a), (b), and (c).—Disc Condenser, Explanatory Sketches

V'_2 and to the fixed vanes at V_2 . In Fig. 177 (a), it is seen that both the movable and fixed vanes connected to the terminal T_2 are in the right-hand bank, and the movable and fixed

vanes connected to the terminal T_1 are in the left-hand bank. Thus the capacity of the condenser in this position is practically zero, the effect across the opposing edges of the vanes along the centre being negligible. If the vanes V'_1 and V'_2 be moved together into the position shown in Fig. 177 (b), they interleave with the fixed vanes connected to the opposite terminals, the resulting effective capacity areas being shaded in the figure. If the moving vanes be taken through another 90 degrees, as shown in Fig. 177 (c), it is seen that the whole areas of the vanes are active, as those connected to one ter-

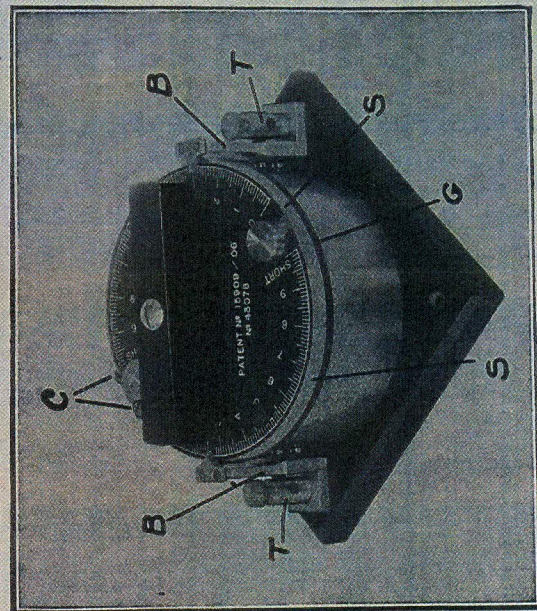


FIG. 178.—EBONITE DISC CONDENSER (ADJUSTABLE).
B, Index and Brush Standards.—G, Protector Gap.—S, Movable Vanes Contact Strips.—T, Terminals.

minally completely interleave with those connected to the other. This, of course, means that the condenser has a maximum capacity, and it is easily seen that a condenser of this type is continuously adjustable, so that extremely small variations of capacity may be obtained.

A brass contact piece, C, is attached to the movable vanes connected to the terminal T_2 , and if the handle be turned a little beyond the maximum capacity point, C makes contact with a stop C_1 , which is permanently connected to the terminal T_1 , thus shorting the condenser. One of these condensers, mounted separately for independent use, is shown in Fig. 178.

To each of the terminal blocks T, is connected a set of fixed vanes; and each standard B, supports at the top an index which overhangs the scale, and at the base a flexible vertical brush which can be seen bearing on a brass contact strip S, that connects to one set of moving vanes.

Between the two contact strips is a safety spark gap, G, having a width of $\cdot 01''$. The ebonite below and behind the gap is cut away to increase the surface insulation. One only is shown in the illustration; there is, however, a second diametrically opposite to it. The gaps protect the sheets of thin ebonite dielectric from puncture when exposed to excess voltage. Care should be taken to keep them free from dust, and no grit should be allowed to get under the brush contacts. In the actual condenser illustrated, the short-circuit is arranged by the brushes bridging the gaps G. The stops C are simply screwed into the ebonite; they do not connect to the moving vanes.

The Telephone Condenser.—This condenser, which is shown

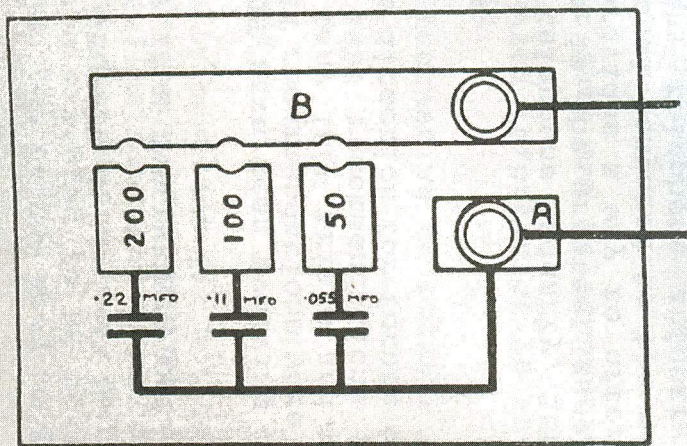


FIG. 179.—Telephone Condenser.

in Fig. 170, has sheets of tinfoil as conductors, the alternate sheets being separated from each other by a mica dielectric. The condenser is divided into three parts, varying amounts being placed in the circuit by means of brass plugs and sockets. A sketch of the connections is shown in Fig. 179. Five brass blocks are disposed on the ebonite top of a teak box as shown. Three condenser groups of $\cdot 055$, $\cdot 11$ and $\cdot 22$ microfarads respectively, are fixed in paraffin wax in the wooden box.