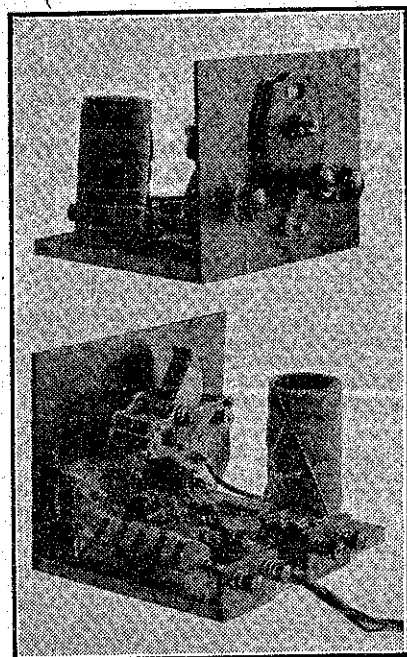


Simple, Powerful, Cheap!

The "Differential One"



ties if tackled all at once. It will be seen how easy is the construction of the "differential" one, and we promise the reader that the future additions will be equally easily made.

That is not all, however. If the programme is carried out in its entirety, the constructor will be possessed of a first-class four-valve receiver. He can equally well stop when he has brought it to the three-valve stage, or the two-valve stage, or he can even rest content with the one-valve set as here described; there is no better one-valver. The only thing to remember is that it is as well to decide once and for all to just what stage the receiver is to be carried, as for a three-valve version the panel and baseboard can be considerably shortened, the space left for the addition of a high-frequency stage no longer being necessary, while if only the one-valver is contemplated a still further shortening is permissible. We publish a photograph showing the layout of a one-valve set.

The receiver is to be "all-wave." In this present article only the broadcast coil is described, but the short-wave coils will be described in due course. The difficulty of adjusting the tuning capacity to long and short bands has been surmounted by arranging a plug with alternative sockets, one of which places a fixed capacity of .0001 mfd. in series with the tuning condenser, so reducing the tuning capacity to something suitable for short-wave work. If a word of advice is permissible, we are inclined to recommend that if the receiver is to be used primarily for short-wave reception, the constructor should not trouble to add the high-frequency

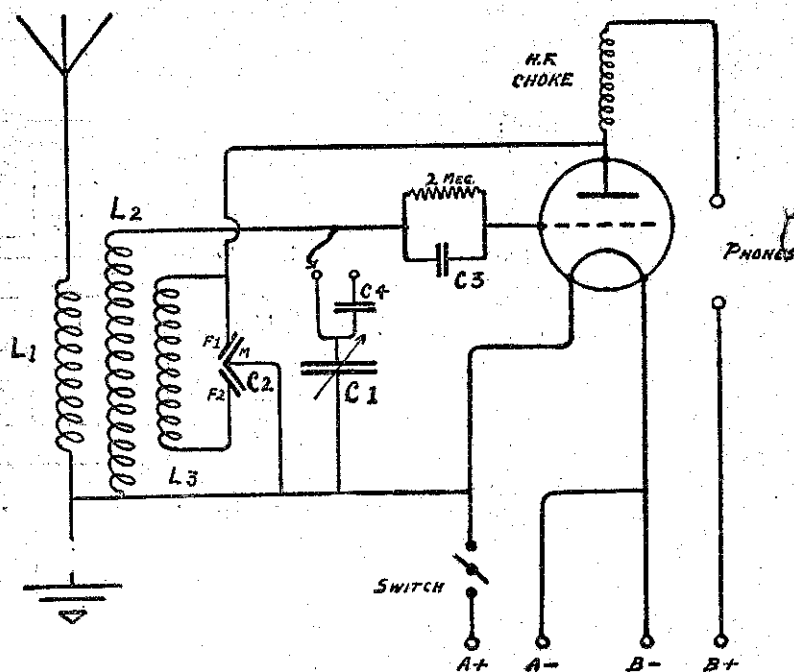


FIG. 1

FIG. 1.

- C1. .00035 or .0005 m.f.d. Tuning Condenser.
- C2. .0001 to .00015 Differential Condenser.
- C3. .00025 m.f.d. Fixed Condenser.
- C4. .0001 m.f.d. Fixed Condenser.

stage; if, on the other hand, broadcast reception is the primary consideration then the addition of the fourth valve is well worth while.

We do not intend to infer that the four-valve version is unsuitable for short-wave reception—far from it; the only thing is that the extra valve hardly "carries its weight" at the higher frequencies.

Special Reaction Employed.

THE feature which is principally responsible for lifting this receiver out of the rack is the special form of reaction control employed. To appreciate fully the advantages of this control it is necessary to delve into ancient history a little.

Most of us remember the days of the old "swinging-coil" reaction control; this was capable of providing good signal strength apart from the difficulty of control, as this type of circuit was very sensitive indeed. Its great disadvantages were the effect the reaction control had on the tuning—a station could be tuned in or

out by this means—and the exceeding coarseness of the control.

We were then provided with the Reinartz and similar capacity-controlled reaction circuits. Once the initial difficulty of hand capacity had been overcome these were a great improvement on the older circuit. There was a certain loss in sensitivity as compared with the older circuit, however, and the tuning effect of the reaction control, though reduced sufficiently for broadcast reception, was still very pronounced in short-wave reception.

Both these drawbacks have been very largely eliminated in the present design. It has been found that the reduced sensitivity of capacity-controlled reaction as compared with the swinging-coil control is principally due to the lack of an adequate by-pass for high-frequency currents in the plate circuit of the detector. The first effort at combating this condition comprised an additional by-pass condenser which had to be of just such a size as to provide sufficient by-passing additional to the reaction condenser, yet

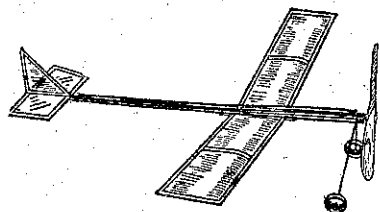
BEFORE commencing on the description of this receiver, there are two or three little points which should be brought prominently to the notice of the prospective constructor. The first is that the single-valve receiver now to be described is intended to form the nucleus of a larger receiver. The additions to the set will be described one at a time in future articles, so that the opportunity is offered the comparatively unskilled constructor of eventually constructing a receiver which would be beyond his capability.

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