

cable leads; though a manufactured cable, the cost of which is low, will enhance the convenience of connecting and disconnecting the battery.

The set is wired with the convenient insulated wire. Point-to-point wiring is used, so that the leads will be as short as possible, and also to keep them from running parallel. The wires which connect to the batteries are arranged with an excess length of several feet, and are brought together at the back of the baseboard. These wires are used as a cable, and they may be braided together if desired. A staple, driven into the base, will serve to keep the wires of the cable together.

Choice of Valves.

THE valves used in the set are chosen to give the best and most stable results. The standard 201A-type is used as the radio-frequency amplifier; this stage serves the triple purpose of increasing the volume, the sensitivity and the selectivity of the receiver, while preventing the oscillation in the detector stage from causing interference in neighbouring sets.

The second valve is of the special-detector, high-amplification type, since this valve is far more sensitive than the 201A type, when properly used. It will be noted that the grid return of the detector is connected to the negative side of the filament, contrary to the usual procedure with hard valves. Since this might cause confusion in the minds of some of our readers, it is well to mention that this is done solely because of the special type of soft valve used in this socket (300A). If the regular 201A valve is used in this socket, the grid return should be connected to the positive side of the valve filament. In any case it is well worth changing over to obtain the best results.

The valve in the audio-frequency stage is a 112A semi-power type. This was chosen because of the better quality resulting from its use. This is especially true if a second audio stage is to be employed and, since we are building the set with the thought in mind that a power amplifier and "B" power unit may be built later to give good loudspeaker volume, we have incorporated the 112A in the original set.

In the above it will be noticed we have specified types. Any good dealer will be able to advise the constructor the valve corresponding to the type he requires, in the make he fancies.

Testing and Operation.

AFTER the set has been completed, the next point is to test the wiring to be sure that no mistakes have been made. This is done by connecting a "C" battery and a pair of headphones in series and applying this test unit across the various cable connections in turn. With the valve out of the sockets, no click should be heard between any of the wires; either in the filament line or the wires to the plate supply. If no clicks are heard, the batteries are connected as shown in the

schematic diagram (fig. 1), and the valves then inserted in the sockets. The headphones should be connected to the terminals marked "L.S."; and the aerial and ground connected to the other two terminals on the binding-post strip. The set is then ready for operation, and the filament switch may be closed.

ing the "—" (negative) side of the "A" battery to ground. If this is found to effect an improvement, the wire may be incorporated directly in the receiver itself; it is then important to have the ground connected to the correct terminal. The additional wire is merely connected between the negative filament "F—" terminal, of the first or

sistor should be turned back until the whistle stops, and the dials should be turned again. If a soft whistle is heard, the "Phasatrol" is turned too far, and its screw should be turned to the left until the whistle stops. When the "Phasatrol" is adjusted and the resistor is turned to the correct position, no whistles will be heard (except those caused by other sets in the neighbourhood, which unfortunately, may be heard in any set). When the set is first placed in operation, it is advisable to turn the screw of the "Phasatrol" all the way to the right; so that trouble will not be encountered in picking up signals until the receiver is adjusted properly.

If an amplifier or B power unit is to be built later, it is more economical to buy very small B and C batteries, so that the cost of the set can be kept low. The filaments of the valves are lit by a storage battery of the usual type, and a good one should be obtained. If it is desired to operate the set entirely from the electric-light lines, an A power unit may be purchased instead of the battery.

A Few Pointers.

EVERY receiver, however simple, has a number of points at which trouble may be encountered; and those not familiar with "trouble-shooting" might find them difficult to locate, if the set does not work right at first. The first thing to suspect is the valves; take them to the dealer from whom they were purchased and have them tested. If these are all in satisfactory condition, look over the aerial. This is a very critical point; especially if the aerial was erected some time before the set is built. The insulators should be checked, and the lead-in should be looked over very carefully. A poor contact in the wire, or poor insulation at the point where the lead-in enters the building, often causes a good set to operate poorly.

If the testing of the valves and the inspection of the aerial and ground are satisfactory, the batteries should be tested with a voltmeter. Again test all the wires and connections with the C battery and phones mentioned above, to be sure that they are all tight. In this test, with the phone and battery, a coil should give a loud click through the winding and none between windings (this is between primary and secondary). An audio transformer gives a weak click in both the primary and secondary, but in most cases the click from the secondary is weaker than that from the primary. It may be better to use a B battery for testing the audio transformer, so that the click will be louder. If no click can be heard, the transformer is defective. In testing condensers, the click is very weak and no continuous noises are heard. In some cases, as in the variable condensers, it is necessary to disconnect the part from the set; because the coils or other apparatus are shunted across the condenser and it will appear to be short-circuited.

(Concluded on page 36.)

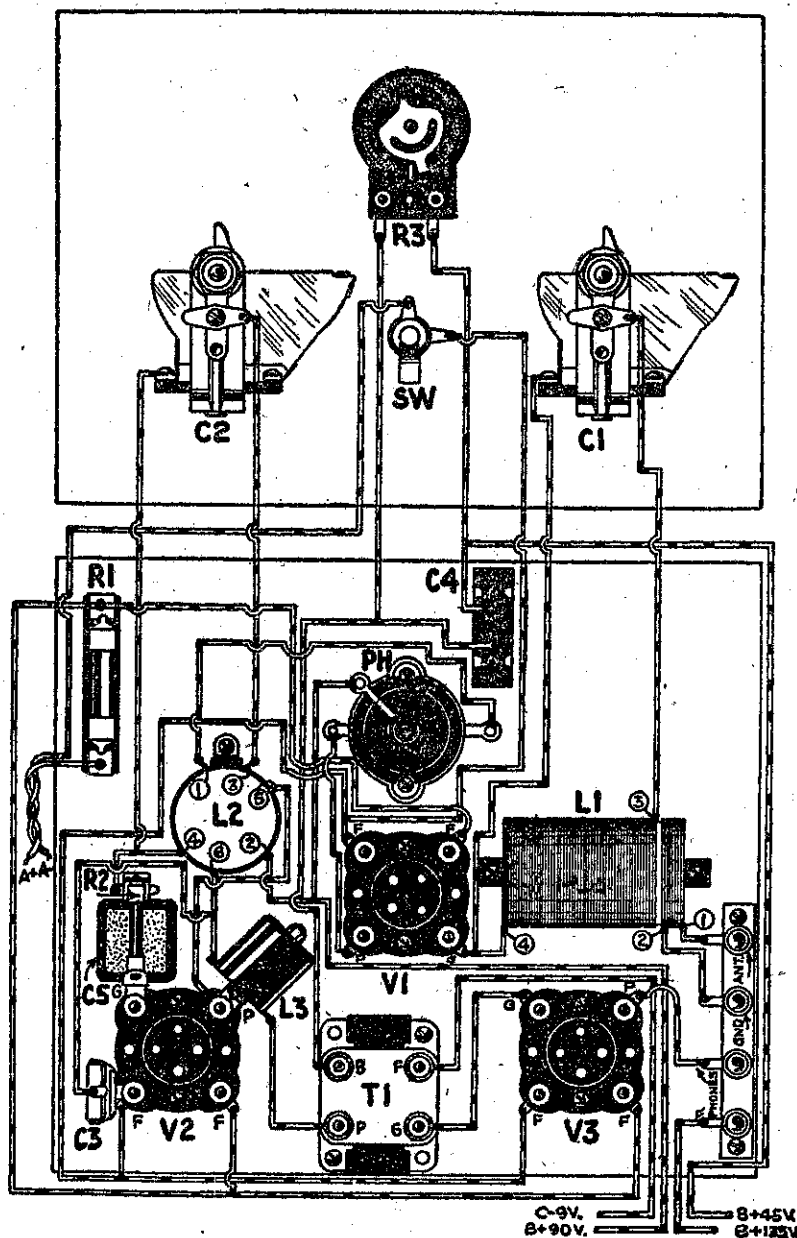


Fig. 2.—The wiring and parts layout of the "Beginner's Three" is shown here very plainly; the wires are here indicated at right angles, for the sake of clearness, but in actual work they are run more directly between terminals. The numbers of the coil terminals should be observed closely when making connections.

It is not important which side of the primary coil is connected to the aerial and which to the ground. In some cases, however, the operation of the receiver may be improved by connect-

ing the "—" (negative) side of the "A" battery to ground.

It will be found that the set will whistle when the resistor knob of R3, on the panel, is turned too far to the right. While tuning the set, the re-

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