where all the components are in place. Where possible, secure them to botts used for the valve sockets, partition, etc. Condensers next to the tin strip may be soldered to it.

In order to save space, it is a good plan to turn round the legs of the voltage divider. When this is done, the central screw rod is inclined to be short, but if kin. of the Pirtoid tube is sawn off, reassembly is easy.

A few counter-sunk headed screws will be required for positions where the head is required to be flush, as, for instance, under valve-sockets.

Exactly half of the voltage-divider is to be used, so place one of the movable clips exactly in the centre—this will connect to the hum-bucking resistor, and one end is point A shown on the theoretical diagram. It would be possible to divide up a further portion of the voltage divider for the hum-bucking portion, but a trial showed that a separate resistor would answer better. The idea is to fix the hum-bucking point permanently, and stow the fixed resistor away under the sub-base, thus saving the space of a potentiometer.

A high-voltage dynamic speaker field may be supplied by including it as resistance, deducting its resistance in ohms from the 7500 ohms on the voltage-divider, on which 7 millimetres represents 1000 ohms, and 3.5 cm. exactly 5000 ohms. If necessary, the resistance as far as the hum-buck connection may also be taken out, and, in fact, with the extra smoothing introduced by the field, there is little hum left to work on.

#### The Hum-bucking Resistor.

THIS resistor should be of the flat type, 650 ohms, or up to, say, 700 ohms. If such cannot be procured, the constructor can easily made one by winding on a stiff strip of mica about \$\frac{1}{2}\text{in}\$, wide and length 3 inches or so to suit, sufficient turns of enamelled resistance wire to make about 650 ohms. The gauge should not be larger than 38 s.w.g. Clean off one edge and fasten on a board as shown in the diagram. Cut three strips of 20 hard brass 2in, long, tapered and screw to board about in the position shown

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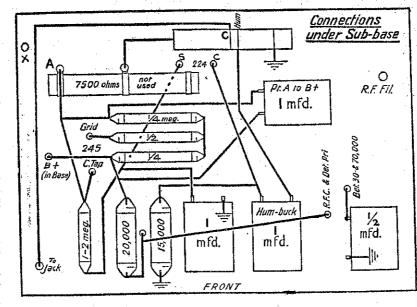
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not too tightly, so that they may be moved over the edge of the resistance. Wires from the receiver are connected as shown to solder-tags under the screws. Move the arms to various positions.

It will be found that moving the hum-buck connection well to the left produces a loud hum, and it will also be found that the hum-buck and point C must be fairly close together for good results, with not too great a reisstance between point C and earth.

In the laboratory model best results were obtained with 200, 10 and 414

To Reac. Con. Fixed, Drilling Plates T. Tick <u>Detector</u> Coil Can Grid T. Sec. BACK Centre for Screw Ĵack 235 Plate RFC <u>Direction of</u> <u>Winding</u> All Coils Begin Parate and an article and a second

ohms, as shown on the diagram, though these must only be taken as a guide because they may not work out for another receiver. If moving the humbuck arm does not get rid of the excessive hum, move the central clip on the voltage-divider about 1-8inch to include a little more resistance.

Mark correct positions on the resistor with white ink or other medium, take off board, and twist two turns of cleaned 32's round each position, soldering a thin rubber flex lead to the twisted end of each. Lay a piece of mica on each side of the resistor, and cover with tape from end to end, when it may be stowed away under the r.f. valve. The leads to the resistor will have been reduced in length after experimenting.

If soldering of resistance wire is necessary, use "killed" acid as flux, because resin is often unsuccessful.

#### Gear in Cabinet Base.

THE smoothing condensers, 1mfd., 2mfd. and 4mfd., and the output transformer are the only components.

The "in primary" of the output transformer is connected to the high voltage side of the 4mfd. condenser, while the "out primary" is connected by a shielded wire through the power-pack compartment to the r.f. choke and 245 plate.

The secondary of the output transformer connects to two terminals on an ebonite strip outside the base. A third terminal is for earthing, and connects internally with the B— wiring and shielding. An 18-gauge wire should run from this terminal up through the power-pack and connect to a solder-tag under the right-hand leg bolt of the sub-base. See that all parts of the shielding are properly earthed.

Run the secondary centre-tap connection of the power transformer direct to

the earthing wire. Earth cores by tucking between one bolt and the core, a bundle of tinfoil containing the end of a thin wire, the other end of which is to be earthed. All shellac should be scraped off the core laminations of choke and transformer where the tinfoil is to contact. The earth contact must be made only at one point on any core.

The general plan to be followed in assembling the receiver proper is to first enamel the front panel, then fit components on it, with the reaction condenser in centre.

The sub-base components and partition are then bolted in place, and wired up as much as possible without the coils. Next, the sub-base is supported in an inverted position and the components are fitted underneath in the positions shown. It is often advantageous to solder a tag to a condenser case so that it may be secured to a neighbouring bolt. The Ferranti and other resistors are assembled without holders in order to save space. The writer first soldered a lead to each end of the Ferranti's, half-way up the slope of the cone at each end, then wrapped each in adhesive tape, covered each with a cylinder of copper foil, and soldered the two cylinders together, and the ends of these to the tin strip. Needless to say, condensers must be of high test and small bulk, so a new type, 1mfd., 1000 test, and only 5-8in, thick suit admirably.

The two 25 meg, and one ½ meg, resistors should be of the substantial composition type. These are all connected together at one end by a short plece of bare wire, leads of suitable length are connected to the opposite end of each, and then each one is covered with adhesive tape. All three can then be laid together, and taped into one bundle, effecting a great saving of space. There is room to use an ordinary holder for the 2 meg.

See that the shelf is drilled in suitable positions for the twisted filament leads, and full B positive, and B positive from output transformer primary. All the above-mentioned leads should

(Concluded on page 27.)

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