

for four small terminals. To the clamping nuts underneath are attached the flex leads from the mains, and on the other side the two wires from the input terminals of the transformer. Strips of tinfoil 1-16in. wide are cut, and when fastened between the terminals on the fuse block provide a safeguard in the event of a temporary short.

A similar fuse is provided for the high voltage secondary, and this effectively prevents any damage to the wire in the transformer if the secondary circuit is shorted.

NEXT to the power transformer is screened a 2 m.f.d. condenser. Then the choke is screwed into place with the direction of the laminations at right angles to those of the power transformer. The other 2 m.f.d. is fixed next to two clips to hold the C battery. It was considered advisable to use an independent C battery in this case, as the cost is very small and, as little current is used, the upkeep of this battery is negligible. A new C battery will generally last about twelve months or more, so it hardly warrants the cost of the extra resistances and condensers that are necessary if the C potential is required from the mains also.

The positions of the two valve sockets and intervalve transformer is shown in the diagram.

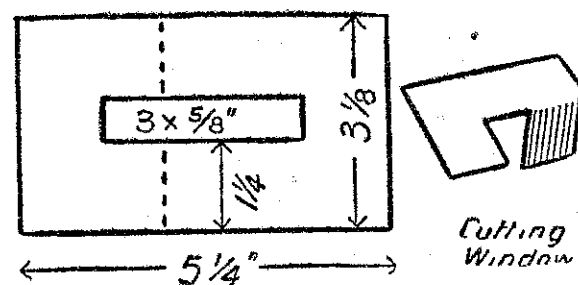
In selecting a transformer one should be chosen with a high ratio between primary and secondary to be able to get as much step-up voltage as possible. A .001 m.f.d. fixed condenser across the primary prevents any choking effect the iron cored coil in the transformer may have. In the amount of 22 D.C.C. gauge wire specified, allowance was made for the winding of the tuning coil. Sixty turns should be wound round the 3in. ebonite former and tapings brought out at the tenth, twenty-fifth, and fortieth turns for connections to the spring clip from the aerial terminal.

Wiring.

ALL the filament wiring can be done underneath the baseboard. From the transformer to the valve sockets

twin flex wire is used, as this prevents to a great extent the field produced when raw A.C. is used in a receiver. The remaining wires are number 18 tinned copper, covered with lengths of insulated sleeving.

Here is a point-to-point connecting scheme. Join by twin flex the two filament winding terminals to the plants of the first valve holder. Carry these wires to the two outside terminals of the potentiometer. Join by twin flex the outside terminals of the tapped filament winding on the transformer to the filament terminals on the second valve socket. Of the same valve holder join the grid and plate together, and



connect to one side of fuse block. The opposite terminal of fuse block goes to one of the high voltage secondary terminals on transformer, the adjacent terminal to third fuse terminal, and the remaining terminal of fuse joins to the following points. Centre of potentiometer, C battery plus, one terminal of each of the two smoothing condensers, the cases and shells of the various components used, the primary of intervalve transformer, the one end of tuning coil, and moving plates of condenser, finally to the earth terminal. Sleeving should be slipped on all lengths where cross wires are likely to occur.

The third end of coil joins to fixed plates of condenser, and to one end of the detector, to the opposite end of detector to free terminal on primary of transformer. The secondary transformer marked G joins to grid of first valve holder. The terminal marked F—on this transformer joins to negative of C battery, and the centre tap filament winding to first terminal on smoothing condenser, and also to one

end of choke. Join the other end of choke to next condenser, and carry lead on to the output loudspeaker terminal on the front panel.

The other speaker terminal joins to the plate terminal or lug on amplifying valve socket.

Lastly, connect up the mains winding to the fuse block provided, and also to the flex for the lamp socket adapter.

Trying Out.

THIS finishes the wiring, and all that remains is to wait for the local station to start operations to give the set a try out. A loud hum will no doubt greet the constructor when first the set is turned on. Turn the potentiometer until the hum disappears altogether or dies away to almost inaudibility. The crystal set operates in the usual way, and if the detector is of the semi-permanent type, do not twist round the knob until you have first lifted the crystal from the face of the other one inside the detector tube.

It has been found that a radio frequency choke inserted in the lead between the centre tap on power transformer, and first smoothing condenser, will make the rectifier more efficient and further prevent any possibilities of any hum. This can be of the slot wound type, with about 1000 turns of 36 enamelled wound in a slot made by sticking two 2in. cardboard circles on a half-inch circle of wood or cork. The slot may be about 1/4-inch wide, and the wire just run in jumble fashion. The two ends can then be brought out to soldering lugs, and the choke inserted where indicated.

Tips and Jottings

A Screen Grid Mystery.

THERE have been cases in America where a new screen-grid valve has appeared to be "dead," and experts have been greatly puzzled. It appears that sometimes the small metal cap at the top is liberally coated with

lacquer, and not until this is scraped off can good contact be made with the clip.

Eliminator Precaution.

WHEN using an A.C. battery eliminator, always turn off the H.T. before the low tension or filament supply, and turn the low tension on before the high tension, so as to avoid excessive stress being set up across the smoothing condensers.

Concerning Push-Pull.

A CORRESPONDENT, A. Webb (Auckland), writes: "I contemplate constructing the push-pull amplifier described in 'Radio Record,' of November 2, and I would like to know the following: Would it be in order to use an amperite in place of the six ohm rheostat? If so would the one amperite do for all three valves, or is it necessary to use a separate one for each valve? In the event of using this method of filament control, would I need a volume control, if so, what would you advise?"

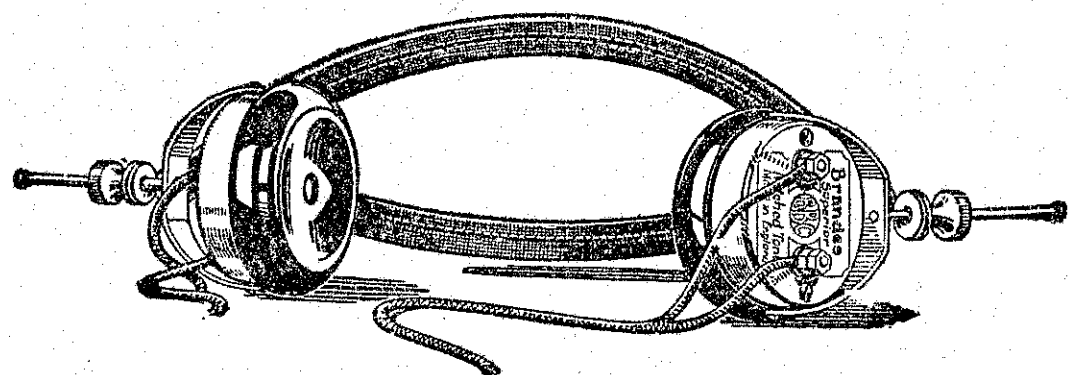
It depends to a great extent on the valve to be used. If all the valves were of the 6 volt. 1 amp type, then a 1/2 amp amperite could be used to control the three valves. If the valves consumed .25 amp each, then the amperite would not stand up to this work. An amperite is generally designed to control the current for one valve only, which is specified on the container. In this case it would perhaps be advisable to know the type of valves to be used and apply for three amperites for these particular valves.

Regarding volume control.—If you desire to use a gramophone pick-up, a volume control is supplied. If a crystal receiver, the best way to do this is to incorporate a variable condenser in the aerial lead and use this in preference to detuning the set.—"Pen-tode."

A neat and sliding revolution counter is available to constructors at 12s. 6d., plus postage, from George Henry and Company, Ltd., engineers, Christchurch. This would be handy to constructors in the making of coils, etc.

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