

on. To prevent any possibility of this small blocks of wood can be nailed to the centre spindle so that the end pieces cannot possibly move. When the whole is dry we are ready to commence winding.

Winding the Transformer.

FIRST comes the primary, consisting of 1850 turns of 32 s.w.g. enamelled wire. To do this successfully some form of winding jig will be necessary. Details have already been given

quickly burn out if just one turn became short circuited.

Finish off with another short length of flex wire passing through a hole in a convenient end. As an insulator is to be applied while winding, shellac is not to be recommended, as it is liable to dissolve the enamel where adjacent turns touch, and instead of improving destroy the insulation. Moltan pitch is the insulator used commercially, but, providing the wire has been wound reasonably tight to prevent any turns slipping, there is no need to apply any form of liquid insulation. The melted tops of old dry cells make a good insulator.

Primary for 110 Volts.

IT would be just as well to mention here the procedure to adopt if the transformer is to be used for the 110 voltage. Two methods are available. The one in which the transformer is permanently wound for the 110 volt mains and the one in which, by a simple alteration, it can be used for either the 110 or 230 voltage. In the first case, half the number of turns will be needed, as specified for the 230 volt winding, namely, 925 turns. As the lower voltage winding takes more amperage it will have to be wound with a heavier gauge wire. Number 28 S.W.G. enamelled wire is quite suitable and should be wound on as for the higher voltage winding separating each layer by a turn of paper.

The second method in which the transformer can be altered makes use of two windings which, when connected in parallel, can be used for the lower voltage supply and connected in series are suitable for the higher voltage mains. To do this, proceed as with the 230 volt winding already described, using the same (32 S.W.G.) gauge wire. When the 925th turn has been put on, cut the wire, bringing the lead out of one end of the spool. Mark this lead number 2. Commence again with a lead (mark it 3) and wind on another 925 turns, marking the final turn No. 4. The first turn to be put on mark as No. 1 connection. And now we have the primary divided into two equal separate halves, all the leads being marked as follow:—

Input of first half, No. 1; output of first half, No. 2; Input of second half, No. 3; output of second half, No. 4.

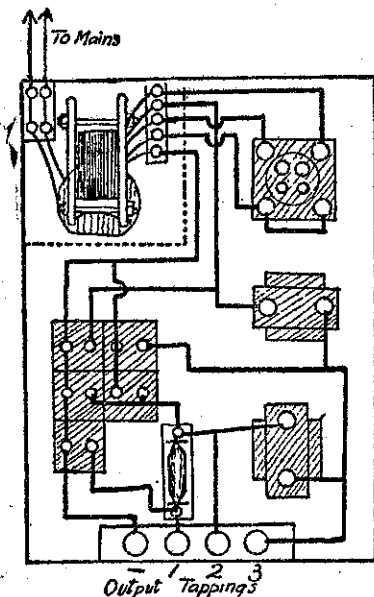
The following connections should be used for either supply voltage. For

former will have to be slightly higher than that needed at the output. One hundred and eighty to 200 volts proves quite OK, and to obtain this the secondary will need about 1800 turns of number 38 s.w.g. enamelled wire. Wind these on exactly as for the primary winding, taking just as much care over the insulation. For either main voltage, the secondary turns remain the same; any adjustments being made are done to the primary only.

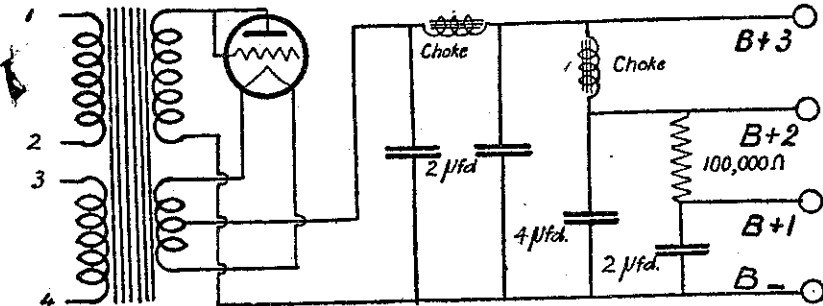
Finally there remains the filament voltage for the rectifier valve, and this

winding must be carefully insulated from the previous high voltage winding. If a six-volt valve is to be used, then 52 turns of 26 s.w.g. enamelled wire will be necessary. This winding should be centre-tapped at the 26th turn, and a lead brought out to one end.

If a two or four-volt valve is available for the rectifier, the number of turns should be in proportion, and the winding tapped at the centre turn. All the leads of each winding should be clearly marked to avoid any mistakes.



in previous issues for the construction of a simple winding jig, and the reader is advised to refer to either these, or the current issue of the "New Zealand Radio Listeners' Guide," a chapter on "Small Power Transformers from A to Z," gives a wealth of information on the subject. It is well worth the slight expense involved. But this is incidental. A short length of heavier flex wire should be soldered to the beginning of this fine wire to pass through a small hole in one end of the spool. Begin by winding on one layer of wire, taking care to not have any adjacent turns cross any of the preceding ones. As this gauge wire allows of 87 turns per inch, there ought to be room for approximately 150 turns per layer. Between each layer wind on a turn of thin paper. As there will be about



18 layers in the primary only, this paper will have to be of the thinnest kind yet thick enough to provide insulation between layers. Over this turn of paper continue the winding of the next layer, and so on until the whole eighteen or nineteen layers have been wound on. Care should be taken to see that none of the turns of wire slip down either of the spool ends between the fibre end and the wire already on, as the transformer would

the 230 volt main connect 2 and 3 together and feed to 1 and 4.

For the 110 volt main connect together 1 and 3, also 2 to 4, and lead the supply wires to No. 1 and 3.

Having completed the primary wind on two or three turns of empire cloth or brown paper, over which is to be wound the high-voltage secondary.

As the fine wire used and also the rectifying valve used has a fairly high resistance, the a.c. output of the trans-

RADIO DIRECTORY

What to Buy and Where

CITIES

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| AERIAL MASTS | Domestic Radio Co., Ltd.,
Strand Arcade, Auckland. |
| ALTONA & HAMMARLUND-ROBERTS SETS. | Johns, Ltd.
Chancery Street, Auckland. |
| ATWATER-KENT RADIO .. | Frank Wiseman, Ltd.
170-172 Queen Street, Auckland. |
| BREMER-TULLY RADIO | Superadio, Ltd.,
147 Queen Street, Auckland. |
| BURGESS RADIO BATTERIES, | All Radio Dealers. |
| CROSLEY RADIO | Abel, Smeeton, Ltd.,
27-29 Customs St. E., Auckland. |
| FERRANTI RADIO COMPONENTS | A. D. Riley & Co., Ltd.,
Anzac Avenue, Auckland, and all leading Dealers. |
| CROSLEY SETS | Lewis Eady, Ltd.,
Queen Street, Auckland. |
| GREBE RADIO | Howie's,
Dilworth Building, Custom st., Auckland |
| LOUDSPEAKER AND TRANSFORMER REPAIRS | A. E. Strange,
404 Worcester Street, Christchurch. |
| MULLARD VALVES | All Radio Dealers. |
| RADIOLA RECEIVERS | Chas. Bennett, Ltd.,
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| RADIOLA RECEIVERS and Expert Radiola Service. | Farmers' Trading Co., Ltd.,
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| RADIO REPAIRS AND SERVICE | E. G. Shipley,
185 Manchester Street, Christchurch. |
| 'RELIABLE' DRY BATTERIES | Royds-Howard Co.,
Christchurch, Distributors. |
| T.C.C. CONDENSERS | A. D. Riley and Co., Ltd. Anzac Ave., Auckland, and all leading dealers. |

COUNTRY TOWNS

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| CROSLEY RADIO | J. C. Davidson,
Main Street, Pahiatua. |
| CROSLEY SETS | F. H. Jellyman, Ltd.,
Devon Street, New Plymouth. |
| CROSLEY RADIO | D. A. Morrison & Co.,
Victoria Avenue, Wanganui. |
| MAJESTIC, ATWATER-KENT AND APEX ELECTRICAL SETS. Also Bremer-Tully, Radiola and Browning-Drake | Radio House, Hamilton.
G. S. Anchor, Manager. |
| PHILIPS VALVES AND APPARATUS | All Good Radio Dealers. |