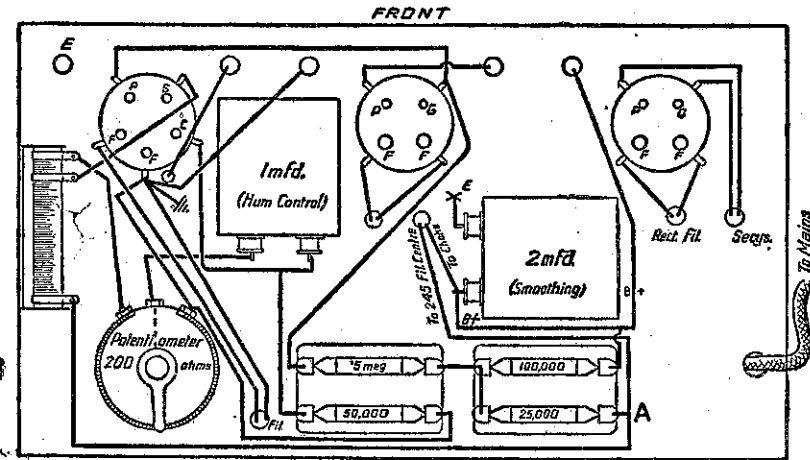


in this pattern of choke the ends of the U must project beyond the spool at XX rather more than 1-8in., so that the wooden clamps may grip both the ends of the U and the cross-piece. Two dozen 3ft. lengths of 1in. stalloil will make the choke, for which four sizes are cut, 3 $\frac{1}{2}$, 2 $\frac{1}{2}$, 2 7-8 and 1 7-8in., but note that the two latter may be shortened, as a $\frac{1}{2}$ in. gap or a shade less may be found to accommodate the winding.

ode is similarly by-passed, because a bias resistor of 3000 ohms, more or less, is placed in the cathode connection to ground.

MANY constructors will be using one or two r.f. stages with 227 type valves, which draw an average of 3 mls. each. For these the breakdown resistance for plate current will be 90 volts, 2 valves 50,000 ohms, 3 valves 35,000 ohms, 4 valves 26,000 ohms, and



Only the smoothing condensers are required to complete the power-pack. They should be of 800 volts test.

A fuse must be provided in each lead from the mains, and to protect the secondaries from accidental short, it is wise to provide fuses for them also as shown in the diagram. Strips of bright tinfoil may be used for fuses, cut very fine for the high-tension.

General.

IT must be understood that any power-pack giving 400 volts and the necessary filament and heater currents can be used with this amplifier. A by-pass condenser of $\frac{1}{2}$ microfarad capacity is placed across the outer or left-hand end of the lead and earth. Screen voltage is obtained in the same way, the outer end of lead, and branches to each screen being by-passed with a $\frac{1}{2}$ mfd. Each valve cath-

for 60 volts, 2 valves, 58,000 ohms, 3 valves 38,000 ohms, wire-wound resistances, 5-watt rating.

Where demands for the r.f. stages of a receiver exceed two or three valves at the most, a large power-pack than that specified should be used, including a $\frac{1}{2}$ in. core transformer.

If possible, test with a milliammeter to make sure that the plate of the 245 is drawing exactly 30 milliamperes.

If a crystal set is used for local reception, it should be coupled to the amplifier through a high-grade audio transformer of the A.F.3 type, the crystal set connected to the primary. This will give considerably more volume than the crystal output direct without transformer. A cheap transformer should not be used, because that would mean sacrificing some of the quality gained by the amplifier system.

Radio Weather

(Continued from page 32.)

cloud itself. It will then branch upwards from an origin in the positive region, or from the positive area to the ground. Then it will branch downwards, or from the ground to the negative area in the rear of the cloud, when it will branch upwards.

The discharge will have the appearance of a river with its mouth on the positive charge. After a discharge, the field will gradually be rebuilt until the sparking potential is again reached. Subsequent discharges will tend to follow the old path which will remain conducting. Gradually, however, it will be broken up and swept away by the wind. The third type of discharge will be infrequent, but violent.

It should be said that C. T. R. Wilson and his followers assign an opposite polarity to thunderstorms to that claimed by Simpson. Recent papers on observations on thunderstorms in South Africa by B. F. T. Schonland appear

to support C. T. R. Wilson's viewpoint very strongly.

C. T. R. Wilson has shown that the quantity of electricity involved in a lightning discharge is approximately from 10 to 50 coulombs. The total potential difference is of the order of 1,000,000,000 volts. That is, the potential difference between the centres of the positive and negative charges. It is almost certain that thunderstorms are the origin of atmospherics, since it does not seem possible for field changes of sufficient intensity to be produced in any other way.

In our next issue Dr. Kidson will describe how radio is affected by weather.

THE best arrangement for earthing an aerial is one which completely disconnects the receiver at the same time.

IN the absence of crocodile clip quite a good variable contact may be made with little "bulldog" clips (supplied by stationers), or by small paper clips.

Short-wave News

A German Short-wave Shipping Service.

AS a result of the successful experiments which have recently been conducted from the coastal wireless station at Ouxhaven with fishing vessels and steamers plying between sea-side resorts, a new station with a more powerful transmitter is to be erected to serve the German shipping in the North Sea. The coastal station at Norddeich is installing a short-wave transmitter for radio telephony. All the larger German passenger steamers are equipped with short-wave receiving apparatus and telephonic com-

munication with them should become possible in the course of the year.

Unfavourable Conditions.

RECEPTION continues to be very poor during the early hours. Just before daylight a blanketing effect is noticed on all signals, morse and telephony. Zeesen, the German high-power transmitter, has lost its punch; 5SW is very weak till it is time to leave home; GBP and 2ME on duplex telephony appear to carry on quite well between themselves, but are not heard too well here. The English station comes in better than the Australian.

RADIO DIRECTORY

What to Buy and Where

CITIES

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| AERIAL MASTS | Domestic Radio Co., Ltd.,
300 Queen Street, Auckland. |
| ALTONA & HAMMARLUND-ROBERTS SETS. | Johns, Ltd.
Chancery Street, Auckland. |
| BURGESS RADIO BATTERIES, | All Radio Dealers. |
| CROSLEY RADIO RECEIVERS | Harringtons (N.Z.), Ltd.,
40-42 Willis Street, Wellington. |
| CROSLEY RADIO | Abel, Smeeton, Ltd.,
27-29 Customs St. E., Auckland. |
| KING RADIO RECEIVERS ... | F. J. W. Fear & Co.,
63 Willis Street, Wellington. |
| LISSEN RADIO PARTS AND KITS | All Radio Dealers. |
| MAJESTIC RADIO RECEIVERS | Kirkcaldie & Stains,
Wellington Agents, Lambton Quay. |
| MULLARD VALVES | All Radio Dealers. |
| PILOT 1930 PARTS AND KITS, ETC. | Abel, Smeeton, Ltd.,
27-29 Customs Street East, Auckland. |
| PILOT 1930 PARTS—PILOT SUPER WASP KITS, GILFILLAN, KELLOGG and AT-WATER KENT SETS | Harrington's, N.Z., Ltd.,
133-140 Queen St., Auckland.
40-42 Willis St., Wellington. |
| RADIOLA RECEIVERS and Expert Radiola Service. | Farmers' Trading Co., Ltd.,
Hobson Street, Auckland. |
| STEINITE RADIO | G. G. Macquarrie, Ltd.,
120 Willis St., Wellington. |

COUNTRY TOWNS

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| CROSLEY SETS | Abel, Smeeton, Ltd.
Bank St., Whangarei, G. A. Temple, Mga. |
| CROSLEY SETS | Abel, Smeeton, Ltd. Rep.: C. Buscoe,
409 Devon Street, New Plymouth. |
| CROSLEY SETS | Dobbs Bros.,
176-8 The Avenue, Wanganui. |
| MAJESTIC, ATWATER-KENT AND RADIOLA ELECTRIC SETS | Radio House, Hamilton.
G. S. Anchor, Manager. |
| PHILIPS VALVES AND APPARATUS | All Good Radio Dealers. |