

Loftin-White Amplifier

Simplicity, Power, Economy.



GOOD quality resistances should be used throughout, so that no trouble is experienced from noise caused by partial breakdown. Wire-wound resistors should be used for all in the circuit from point A to B—because this part of the voltage divider carries the whole of the 30 mills. plate current of the 245 valve. For the 25,000 and 100,000 carborundum resistors would be suitable, as only about 1 mill. passes through these.

According to the voltage delivered by the power-pack, so must the total value of resistance between point A and "B—" be regulated. In ordinary amplifiers the highest "B" voltage is fed to the plate of the last valve without any break-down resistance, but in this case the plate of the 245 is to receive a full 250 volts with a resistance of several thousand ohms in the circuit. For practical purposes we may assume that 32 mills. will pass through the resistance between point A and B—, so if the total resistance is 6100 ohms there will be a drop of 183 volts across it.

The value of this series of resistance must not be too low, or the screen and bias voltages may not be conveniently obtained, so it is therefore necessary to provide a high initial voltage from the transformer, reducing it by suitable resistance. The initial voltage of the transformer secondaries will be 400 on each side, which will be increased in the rectifier and filter system to about 433 volts, and subtracting from this the 250 volts dropped in the 245 valve,

there remains 183 volts to be dropped in the resistances.

The value of these resistances should be kept as nearly as possible, but a few ohms either way is immaterial. The total of 6100 ohms may be made up of wire-wound resistances in any manner that suits the constructor, so long as provision is made for tapping at the points shown. Flat resistance strips are procurable, of various values, and might be conveniently tapped by means of a small clip made of springy brass. Two strips of 425 and 5500 ohms respectively, with a 200-ohm potentiometer in series between them, would answer well. The resistance should be of 5-watt rating. The position of the screen tapping at Y is distant from Z one-seventh of the length of the 5500-ohm winding.

Different resistance values would have to be used for any last valve passing more or less than about 30 mills. in the plate circuit, and in addition other changes have to be made to obtain correct grid bias.

Plain flat resistances are easy to use, because if over the required value a thin wire connection may be twisted round at any point to reduce to the correct value. Tappings may be taken out at any point in the same way. Constructors will soon devise a means of mounting these so that they are insulated from the metal chassis, by the use of small pieces of ebonite and 1-Sin.

By "MEGOHM"

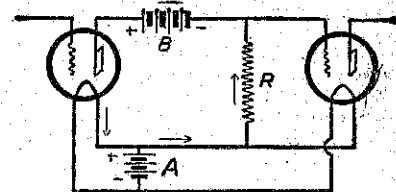
Part 2

bolts. Clips can be made by bending double a small strip of brass and soldering a lead to the bend.

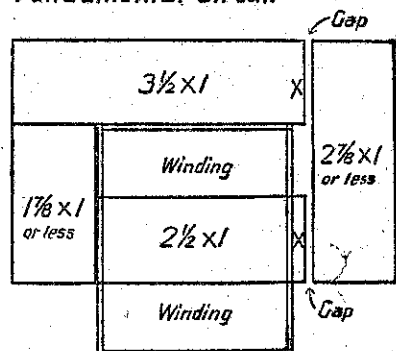
The Power Pack.

THE power pack consists of a transformer, smoothing choke, two 2 mfd. condensers and one 1 mfd., all of 800 volts test. Core material may be purchased ready cut to size for the transformer, the strips being $\frac{3}{4}$ in. wide, built to $1\frac{1}{2}$ in. thick, which is the equivalent of a core slightly over 1 in. square. The window in this stock size is $2\frac{1}{2}$ in. x $1\frac{1}{2}$ in., so the spool must be barely $2\frac{1}{2}$ in. long outside, and the ends $3\frac{1}{2}$ x $2\frac{1}{2}$ x $5\frac{1}{2}$ in. Strips of thin brown or other strong paper must be cut the inside width of spool and must be placed between each layer of wire, securing the small overlap with secotine. Do not waste space with broad overlaps.

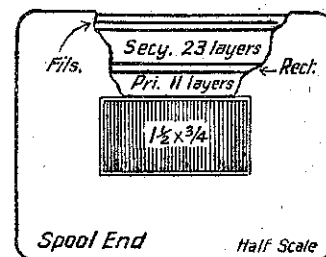
The primary turns for this transformer will be 1700 turns of 30 s.w.g. enamelled wire for 230 volts 50 cycles, and 6080 turns for the secondary, using 36 s.w.g. enamelled wire, in one continuous coil, tapped at the 3040th turn. The winding must be close and even, so that it does not occupy too much



Fundamental Circuit



Smoothing Choke



Ready-cut Transformer

Paper between layers must not exceed 3-32 in. for 24 sheets thickness.

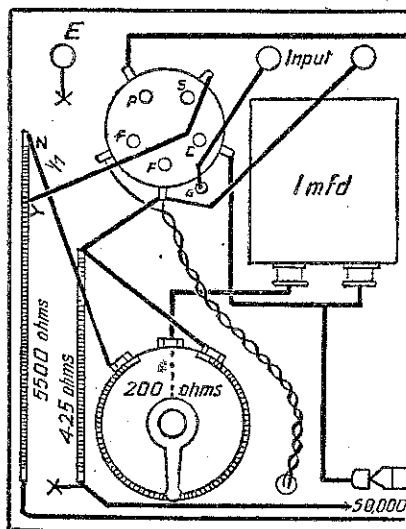
An Alternative Transformer.

THOSE who wish to cut the stalloy themselves will use 1 in. of which two dozen 3 ft. lengths will be required. The long piece should be $4\frac{1}{2}$ in., which gives a window $3\frac{1}{2}$ in. long. The other dimension of the window will be made to suit the winding, but should not exceed one inch. The primary turns will be 1850, all wire gauges as in the transformer described above. The secondary turns will be 6700 tapped at 3350. Filaments 2.5 volts 24 turns, 5 volts 47 turns.

On page 54 and following of the "Listeners' Guide" will be found many helpful hints on transformer and choke construction.

The Smoothing Choke.

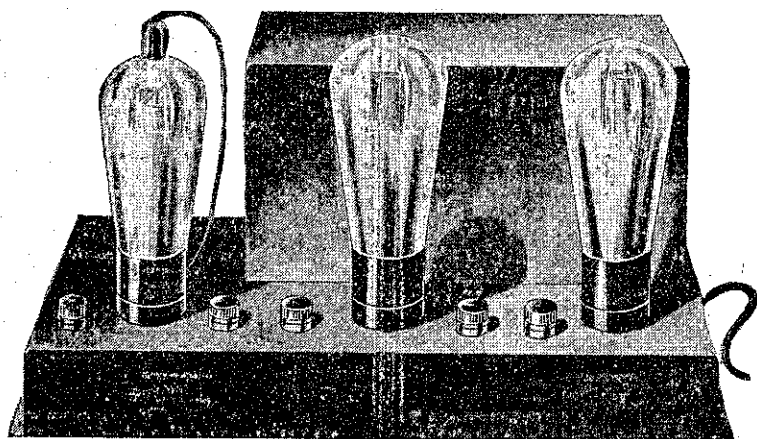
ONLY one choke is required, but two features are introduced into it, firstly, the shape of the core, and secondly, the provision of a tap at the centre, so that a smoothing condenser may be connected up. The core is 1 in. square, and spool ends $2\frac{1}{2}$ x $5\frac{1}{2}$ in. square, to contain 7000 turns of 32 enamelled wire, with a d.c. resistance of 367 ohms, giving a drop of only 18 volts when passing 50 mills. Outside length of spool $2\frac{1}{2}$ in. The tap is taken out at the 3500th turn or thereabouts. This is a refinement that may be used on any eliminator. The inductance of this choke may be varied from 35 to nearly 50 henries according to the width of the gap, which is increased for increased current, which lowers the inductance. One-sixteenth inch is the minimum gap to use each side for about 40 mills. Cardboard is used to fill the gaps. Note that



space, as the window size is fixed where ready-cut stalloy is used.

For technical reasons the two amplifying valves cannot be heated from one winding, so a separate winding of 18 d.c.c. is to be provided for each, 21 turns for the 224 and 245, and 42 turns for the 280.

This is a 50-watt transformer, and the amplifier consumes 30 watts, so 20 watts are available for r.f. or detector valves if required. Extra valves should not be heated from the amplifier windings, but two 227's may be run off one 18 winding of 22 turns. There is not room for many extra windings on the stock size mentioned, and care must be taken not to exceed the size of the window. If space is conserved, there should be room for two layers of 18 outside the secondaries.



Loftin-White Amplifier

Complete with Valves £14/10/- Demonstrations Daily

We are able to supply the complete range of components necessary for the construction of this remarkable Amplifier.

Write for list : **F. J. W. Fear & Co.,**
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