

Power Unit and Battery Charger



In designing this combined "B" power unit and "A" battery charger, we have borne in mind the constructors of both the "Home and Country" portable and "Differential" series. In the "Home and Country" receiver, something of the kind is essential in order to economise on the drain from small portable batteries, while the unit will be found at once an economy and a convenience by all those readers who have constructed one of the "Differential" sets.

The same power transformer is used for both the "B" eliminator and the battery charger. The number of windings is, therefore, somewhat larger than usual, and the transformer perhaps a trifle more difficult to construct. However, every effort has been made to simplify the construction as far as possible, while if, after a perusal of the details, the reader still feels that the transformer is beyond his abilities, he can have it made up by one of several firms who undertake this work at a very reasonable charge.

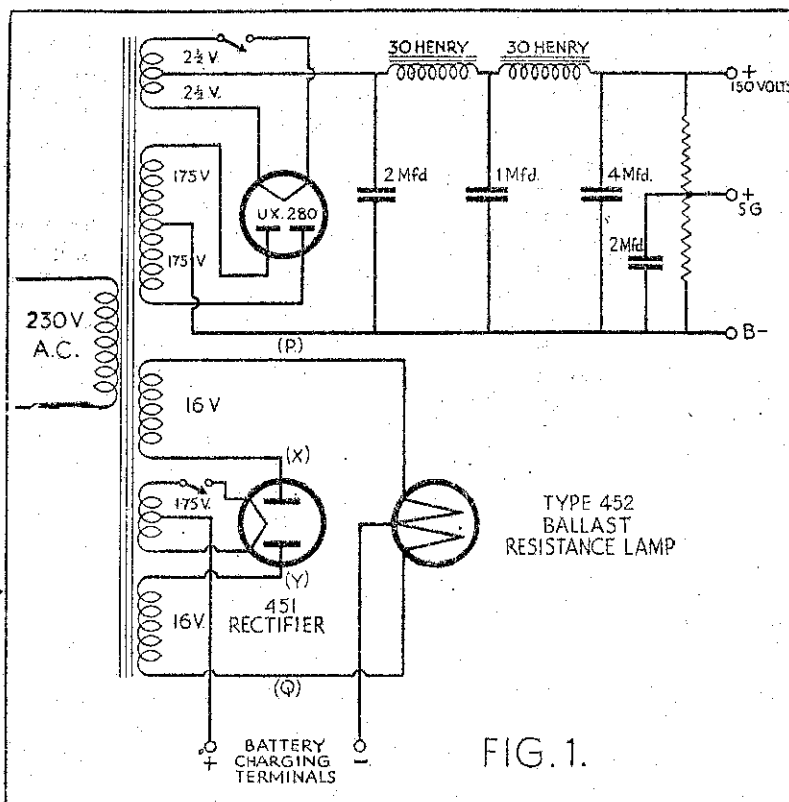
The Transformer.

THE construction of the transformer should be the first task. This has been simplified somewhat by the use of two bakelite bobbins on one of which the primary and the windings for the filaments of the high voltage rectifier valve and the charging valve are wound, while on the other bobbin are wound the centre tapped high voltage secondary and the two 16-volt plate windings for the charging rectifier.

The bobbins used give a core area of $4\text{ in.} \times 1\frac{1}{2}\text{ in.}$, so that the primary will have to be of about 1350 turns. A suitable gauge of wire will be 32 s.w.g. There is no unlimited room on the bobbins, so that either enamelled wire or double silk covered wire must be used. If enamelled wire is used it is absolutely essential that shellacked paper should be put between each layer, and if this is put on while it is still tacky it will help to hold the winding firmly together.

Suitable for "Differential" Series and "Home and Country" Portable

By "Cathode."



The circuit of the power-pack and battery charger.

If double silk covered wire is used, and each layer well shellacked, it is permissible to dispense with the paper interleaving. Wire of this kind, however, is somewhat more expensive than is enamelled wire of the same gauge.

When the primary is wound, a couple of layers of oiled silk should be wound on for purposes of insulation, to be followed by the filament winding of the high voltage rectifier. The 280 rectifier is probably the best available and the filament winding for this consists of 30 turns of No. 20 d.c.c. This winding must be tapped at the 15th turn, the tap being brought out between a couple of scraps of oiled silk. On top of this again, and separated from it by another two layers of oiled silk, should be wound the filament winding for the battery charging rectifier. A Philips Type 451, the filament of which is rated at 1.75 volts, has been chosen for the charging rectifier. The winding should consist of 11 turns of 18 d.c.c. tapped as near the centre as can be managed.

On the other bobbin the high voltage secondary is the first winding to go on, and this can consist of 2000 turns of

36 s.w.g. This may be either enamelled or double silk covered, the same remarks applying as in the case of the primary. On top of this winding, and separated from it by oiled silk, as before, the plate windings for the charging valve may be wound.

There are two of these, and each consists of 96 turns of No. 24 s.w.g. double silk covered wire being really best to use. As each winding is started and finished it is advisable to tag the end of the wire, so that no confusion will arise among the manyappings. The winding will be rendered very much easier if a little winding jig is made to fit the bobbin, and opportunity can be had also to bolt small scraps of aluminium or formica on to the jig to prevent the cheeks of the bobbin spreading.

This is not absolutely essential, however, as the bobbins are fairly stiff and only spread a fraction of an inch. The individual turns need not be counted in the primary and high voltage secondary. The turns in one layer should be counted, and if, then, the layers are

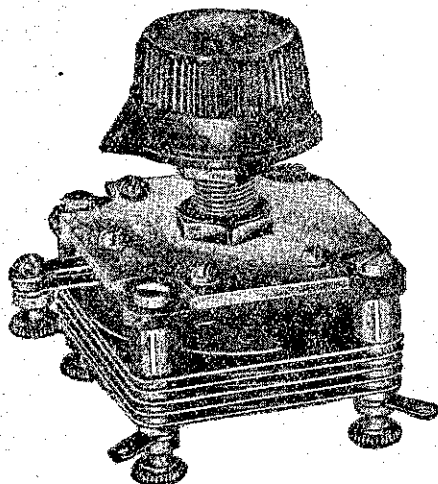
Material List.

- 1 Power Transformer as described.
- 2 30 Henry chokes.
- 1 2-mfd. Condenser (high-voltage).
- 1 1-mfd. Condenser (high-voltage).
- 1 4-mfd. Condenser (high-voltage).
- 1 2-mfd. Condenser (low voltage).
- 1 20,000-ohm. Tapped Power-resistance (25 watt size).
- 1 UX Valveholder.
- 2 English Valveholders.
- 3 Power Switches (not battery switches).
- 1 UX 280 Rectifier Valve.
- 1 Philips 451 Rectifier Valve.
- 1 Philips 452 Ballast Lamp.
- Terminals, Screws, Wire, Etc.

counted instead of the turns, this will be accurate enough for all practical purposes.

Assembling the Laminations.

WITH the bobbins wound, it then remains for the laminations to be assembled. The bobbins are made to fit the standard No. 4 stalloy laminations, and the T pieces should be inserted from alternative sides, so that no two joints will come above one another. Each layer comprises, of course, a T piece and a U piece. The laminations must be clamped tightly to prevent hum, and suitable clamps, as



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