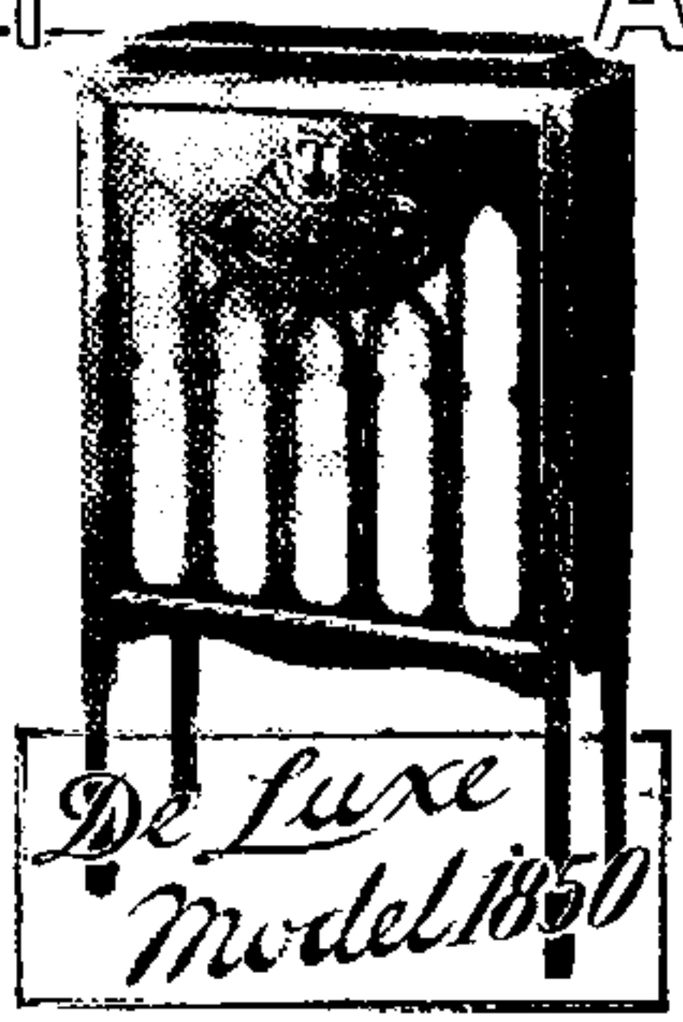
Wireless World

1 JANUARY 28th, 1931.

Burndept A.C. Receiver

Self-contained Console Cabinet with Internal Loud Speaker.

Indirectly Heated A.C. Valves. Power Pentode Output.



THE 1931 range of Burndept broadcast receivers and radio gramophones is centred round a three-valve chassis designed for operation from A.C. mains and incorporating one stage of H.F. amplification, a grid rectification detector and a single power pentode L.F. amplifier. At Olympia this chassis attracted considerable attention on account of its clean design, the accessibility of valves and the mechanical strength of the sheet-steel framework.

The circuit is designed to work in conjunction with an external aerial—either indoor or outdoor. The maximum permissible length of 100 ft. is advised in situations remote from broadcasting stations, but for use in the vicinity of a regional station a short indoor aerial is preferable on the score of selectivity. The input to the tuned-grid circuit of the H.F. valve is controlled by a differential condenser which enables a wide range of volume control to be obtained without upsetting the tuning once the dials have been set for a given station. The input volume control also serves as a means of minimising cross-modulation in the screen-grid valve.

The tuned grid coils are of efficient design, and their diameter is greater than is usually found in commercial designs at the present time. The short-wave coil is a single-layer winding, and the long-wave coil is section-wound in deep slots in a built-up paxolin former. A few turns of each coil are included in the aerial circuit, but the arrangement of the long-wave coupling is unconventional. Actually, the coupling turns are not included in the tuned-grid circuit, but form an external subsidiary circuit which is shunted by a fixed condenser of about 0.0003mfd. It was found with the conventional type of coupling that at certain settings of the differential aerial condenser the coupling turns were tuned to powerful medium-wave stations which seriously interfered with reception on long waves. The arrangement finally adopted raises the resonance of the subsidiary coupling circuit to a wavelength between the long- and medium-wave bands, and the interference, if not entirely eliminated, is considerably reduced.

The tuned-anode circuit of the H.F. valve is centre-tapped, and only half the inductance is included in the valve circuit. Thus the circuit functions as an auto-transformer with a 2 : 1 ratio, and both signal strength and selectivity are increased. The long-wave coil is placed between the two halves of the medium-wave winding to preserve symmetry in the circuit. Reaction is obtained without the necessity of a separate winding by coupling the anodes of the H.F. and detector valves through the medium of a small variable condenser. In practice this scheme works extraordinarily well, and the reaction control is smooth and free from backlash and remains practically constant over the tuning scale on both wave ranges.

The condensers tuning the grid and anode circuits of the H.F. valve are not ganged mechanically, but the edgewise drum dials are mounted side by side so that they can be rotated simultaneously. The condensers remain in step over the greater part of the scale, and one has the satisfaction of knowing that the last ounce of selectivity and range is being extracted when the final close adjustment of each condenser is made independently. The right-hand dial, which controls the tuned-anode circuit, is calibrated in wavelengths.

Wave Range Switching.

The dials are illuminated by a 3.5-volt flash lamp deriving current from the 4-volt filament circuit through a 10-ohm resistance. The lampholder is mounted on a cranked arm which can be swivelled to facilitate replacement of the bulb.

The change from medium to long waves is effected by two switches of new type, which are exceptionally well designed from the mechanical point of view and capable of standing up to prolonged use without developing noisy contacts. They are coupled by a link motion to an operating knob disposed centrally on the control panel at the front of the cabinet. Contacts are included on both switches for changing over to a gramophone pick-up, those on the first switch being arranged to short-circuit the aerial input and so prevent the intrusion of radio signals.

The detector is coupled to the power pentode output valve through a Ferranti AF4 transformer. A fixed condenser connected across the secondary prevents the transfer of stray H.F. currents to the output circuit and also restricts the higher audio frequencies which

SPECIFICATION.

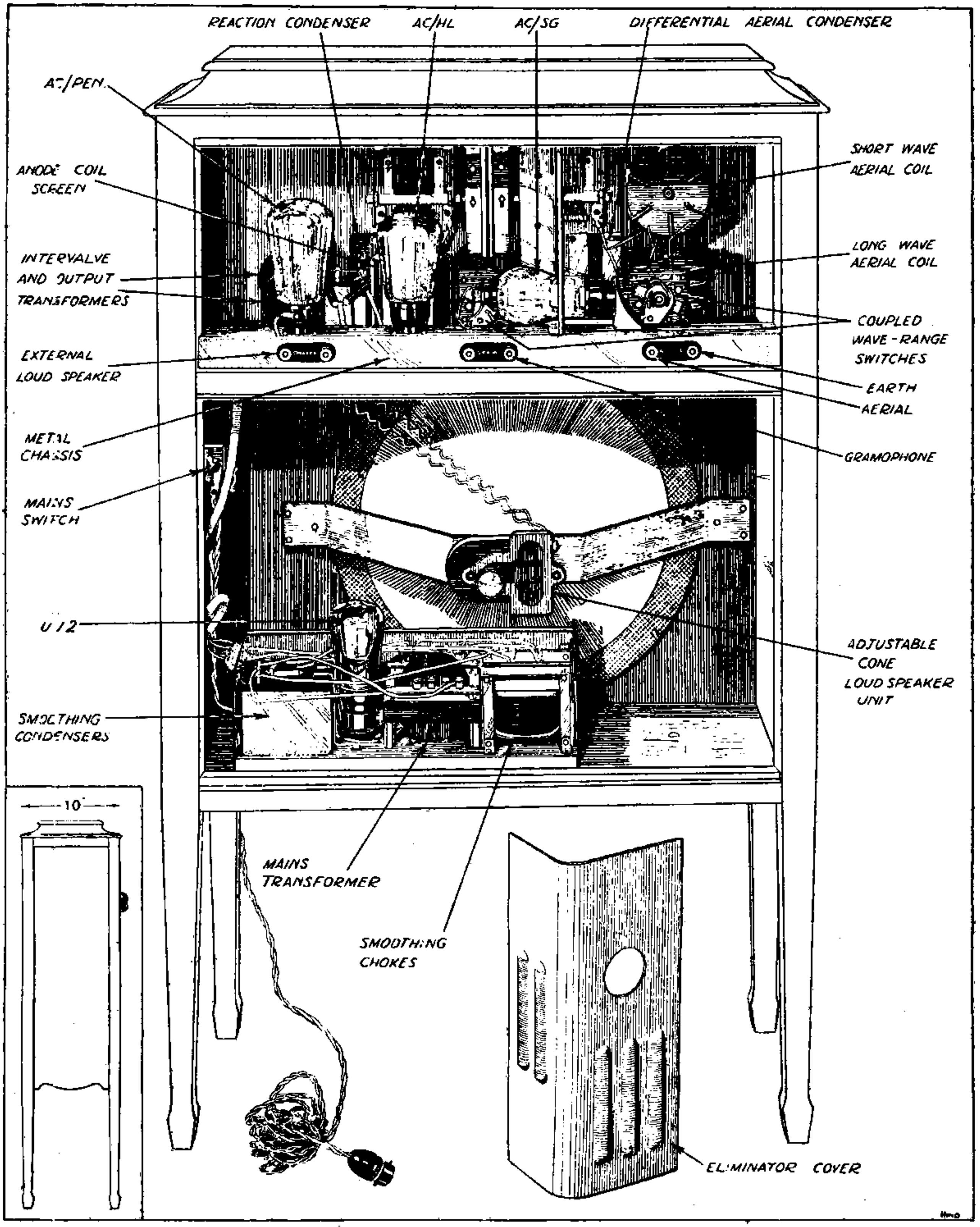
CIRCUIT: Three-valve. One H.F. (tuned auto transformer), grid detector (with reaction), power pentode with dual ratio output transformer. Full-wave valve rectifier. Indirectly heated valves throughout.

CONTROLS: (1) Semi-ganged tuning controls (side-by-side drum dials). (2) Volume control (differential aerial condenser). (3) Reaction. (4) Wave-range and pick-up switch. (5) Double-pole mains switch.

GENERAL: Self-contained console cabinet (depth 10 inches). Terminals for gramophone pick-up and alternative high- or low-impedance external loud speakers. Power consumption 33 watts.

PRICE: 26 guineas in oak or mahogany.

MAKERS: Burndept Wireless (1928) Ltd., Blackheath, London, S.E.3.



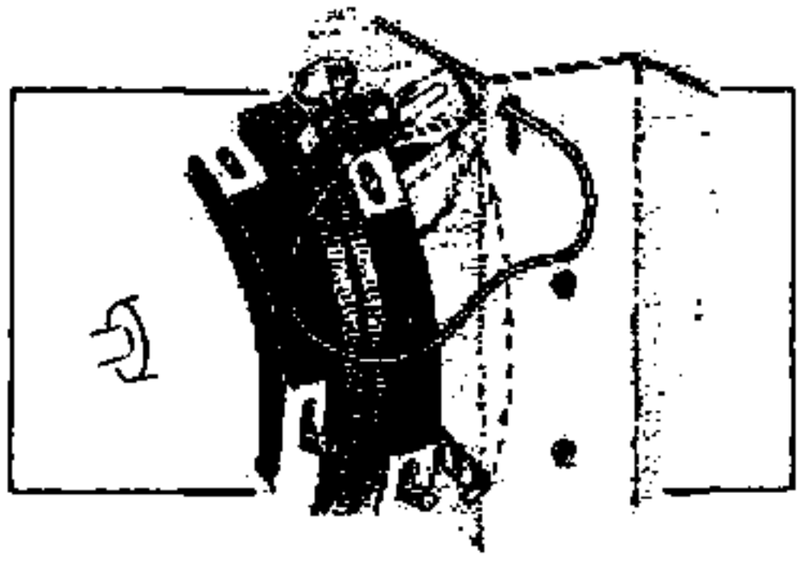
Layout of components in the receiver chassis and power unit of the Burndept A.C. Receiver de Luxe. The back-to-front depth of the cabinet is only 10 inches.

Burndept A.C. Receiver.—

would otherwise be over-emphasised by the pentode in conjunction with the moving-iron loud speaker movement. For a similar reason a resistance is connected across the secondary of the output transformer. This resistance also maintains a constant load across the anode circuit and prevents the development of excessive A.C. voltages which might cause a breakdown in the insulation of the transformer windings.

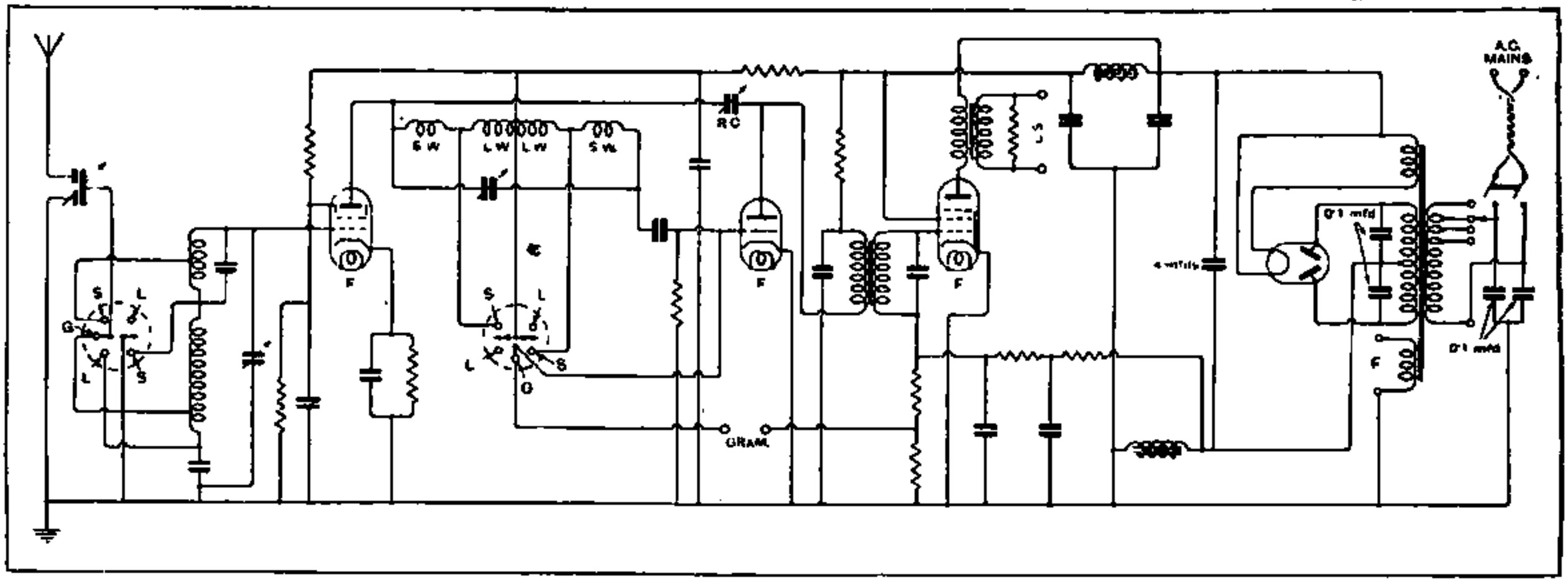
The H.T. supply to the pentode is 28 milliamps. at 230 volts, with a screen voltage of 200, and under these conditions the valve is capable of delivering an undistorted A.C. output of at least 1,000 milliwatts.

In the model reviewed separate terminals were provided for an external loud speaker of average impedance 2,500 ohms, the step-down ratio being 2 : 1; but we understand that in present models an additional tapping is included which gives a ratio of 25 : 1 for moving-coil loud speakers of low impedance.



Pilot light mounting showing cranked lever to facilitate replacement of the bulb.

The components associated with the power supply are assembled in a separate unit. High tension is derived from a type UU2 full-wave rectifier, and the output, after smoothing by chokes in both negative and positive leads, is supplied to the receiver chassis at two voltages—230 volts for the anode of the pentode and 200 volts for the H.F. and detector valves and the auxiliary grid of the pentode. The high-



Complete circuit diagram of the Burndept Model 1850 chassis and power supply unit.

tension circuits are liberally decoupled throughout, the by-pass condensers being constructed as a single bank. It is interesting to note that the anodes of the rectifier are by-passed by two 0.1 mfd. to prevent the development of parasitic H.F. oscillations which might carry 50- or 100-cycle hum into the H.F. circuits of the receiver. Condensers of similar capacity are connected across the mains leads and the mid-point earthed to prevent the ingress of H.F. interference along the supply mains.

The receiver was tested at a distance of five miles from Brookmans Park on a 50ft. outdoor aerial, and 17 foreign stations were received on the medium waveband. The Regional and National transmitters were easily separated at this distance, and Göteborg (322 metres) was received between the two stations without serious interference from either. There was also some free space between the National transmitter and the bottom of the dial, and Nürnberg (239 metres) was successfully tuned-in in this region. In Central London, on a short indoor aerial, either local transmitter could be confined to within 2 degrees of its normal setting.

The range on long waves is good, and eight stations in addition to Daventry were received at programme strength. Radio Paris and Daventry were easily separated, and Königswusterhausen could be received clear of Radio Paris but with some background from 5XX.

In spite of the special precautions which have been taken in the aerial circuit to prevent local medium-wave stations from breaking through into the long waveband some trouble was experienced from the National transmitter (261 metres) when using the 50ft. acrial at a distance of five miles from Brookmans Park. This is a somewhat severe test, however, and in Central London the trouble disappeared entirely.

The cone loud speaker gives pleasing quality and ample volume for a large living room. The control of high-note output from the pentode has been skilfully adjusted, and the balance between high- and low-frequency response in the reproduction of music is just right.

Freedom from mains hum is a notable feature of the performance. One has to listen carefully, even during intervals in the transmission, for any evidence of 50-cycle hum.

At the revised price of 26 guineas the A.C. Receiver de Luxe is extraordinarily good value for money. The cabinet is available in either oak or mahogany at the same price. A table model in walnut, without loud speaker, is now being made, the price being 20 guineas.