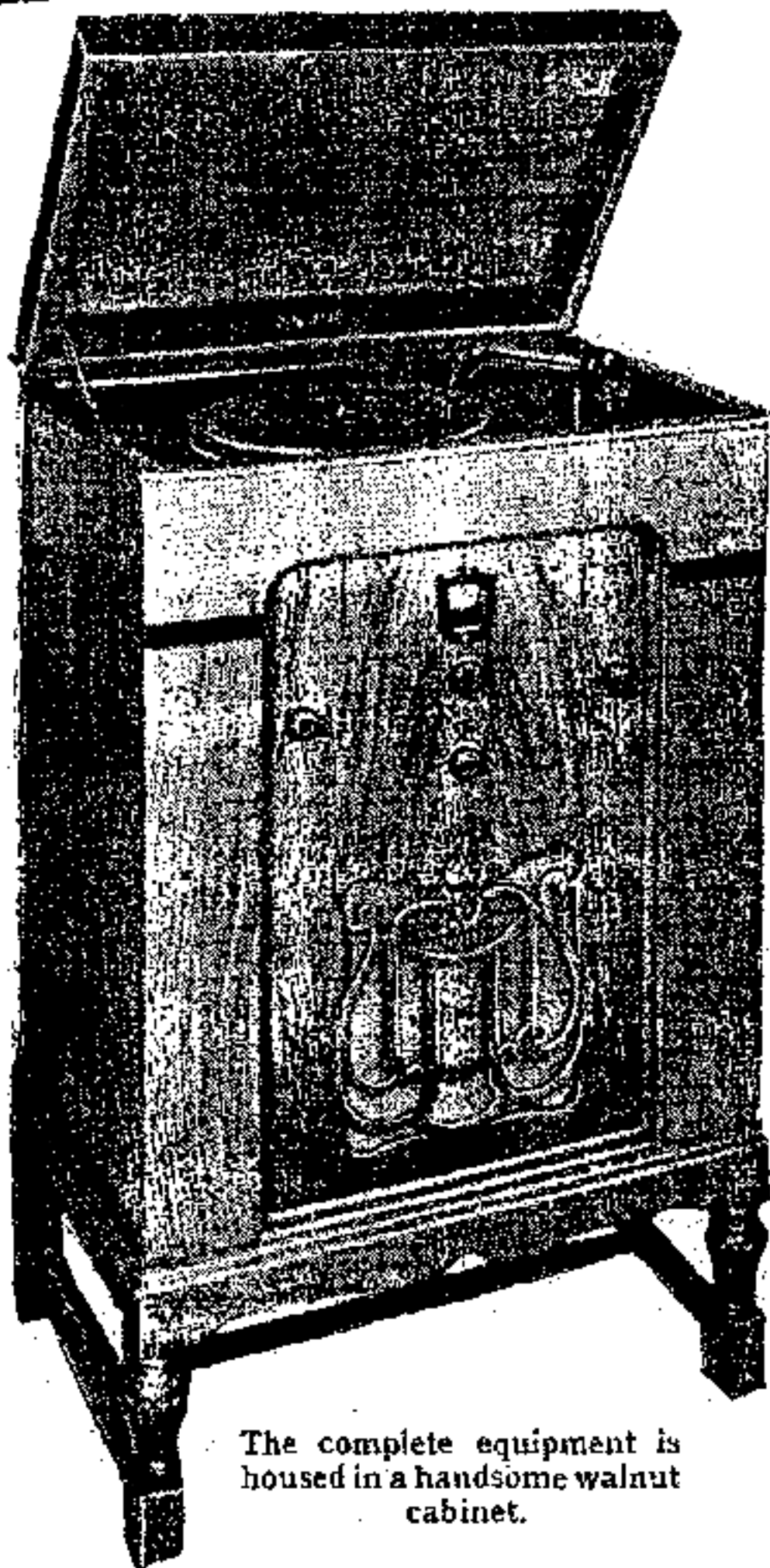


The Stenode Receiver.

THE WHITELEY AND SELFRIDGE MODEL.

An Eight-valve A.C. Radio-gramophone.



The complete equipment is housed in a handsome walnut cabinet.

QUANTITY of reproduction and freedom from interference are undoubtedly the two primary requisites of a receiver intended for the reception of broadcasting, and it is well known that their simultaneous attainment is a matter of considerable difficulty. Many proposals have been put forward from time to time as solutions, of which the two most popular are the band-pass filter and the highly selective circuit with tone correction, although a third method, involving a compromise between the two extremes, has recently made its appearance. Many receivers have appeared utilising in its entirety the band-pass principle, and a number have almost unwittingly employed band-pass filters in conjunction with the moderate degree of tone correction automatically obtainable with a pentode, but very few have appeared in which tone correction has been deliberately introduced.

It is interesting to find, therefore, a receiver in which the "Stenode" principle is fully exploited, for in the set under review no attempt is made to obtain a band-pass action in the intermediate frequency circuits. It will be seen from the circuit diagram that a variable-mu H.F. valve is preceded by a constant peak separation band-pass filter of the link-coupled type, and that the coupling between this stage and the screen grid anode bend first detector is by means of a tuned grid circuit. There are thus three signal frequency tuned circuits preceding the first detector, and it is obvious that

exceptional care has been taken to ensure accurate ganging, even to the length of inserting a fixed condenser in the intervalve circuit to compensate for the discrepancies introduced by the filter coupling condenser.

The aerial connection is made to the first circuit through an adjustable trimming condenser to a tapping on the medium wave coil; a method which, it is well known, leads to inaccurate ganging on the long waveband, owing to the change in the loading of the first circuit. In this case, however, additional capacities are connected across the long-wave sections of the intervalve and filter secondary coils to balance out this change of load and to ensure correct ganging under all conditions.

The oscillator is negatively biased by the usual cathode resistance, but is provided also with a grid leak and condenser, a value of only 25,000 ohms being assigned to the former. The grid coil is tuned, and on the medium waveband correct ganging is secured without the use of any padding condenser, although such a condenser is introduced in the usual way on the long waveband. The coupling to the first detector is by means of a pick-up coil connected in its cathode circuit.

The I.F. Amplifier.

The variable-mu I.F. stage is fed from the first detector through a transformer with tuned primary and secondary windings, and a similar transformer is employed for the coupling between the I.F. stage and the power grid second detector. It is these transformers which provide almost entirely the adjacent channel selectivity; and they are thus of considerable importance. As no attempt is made to secure a band-pass action, the coils are naturally loosely coupled, and so give a maximum of selectivity. Their resonant frequency, moreover, is considerably below that normally used in modern superheterodynes, with the result that the selectivity is higher than can be obtained from an equal number of circuits tuned to the standard intermediate frequency. The disadvantage of a low intermediate frequency, of course, is that second-channel interference problems are increased, and this explains the use of three pre-selector circuits instead of the more usual two.

The anode and screen voltage supplies of these early stages are thoroughly decoupled, and the bias voltage for both the variable-mu valves is obtained from an adjustable potentiometer which acts as the volume control, and affords simultaneous control of the amplification both preceding and following the first detector. The first L.F. stage is resistance-transformer

FEATURES.

General.—Superheterodyne with variable-mu amplification and three tuned pre-selector circuits and ganged tuning. All A.C. operation with valve rectifier, and field supply of the moving-coil loud speaker from the smoothing equipment.

Circuit.—Variable-mu H.F. and I.F. stages with highly selective tuned circuits and two stages of tone correction in the L.F. amplifier. Adjustable tone controls are fitted for both radio and gramophone. A power-grid second detector is used, and both L.F. stages are transformer coupled. The speaker is fed from the output by a choke-fed transformer, and the output valve chosen is one capable of delivering some 5,500 milliwatts.

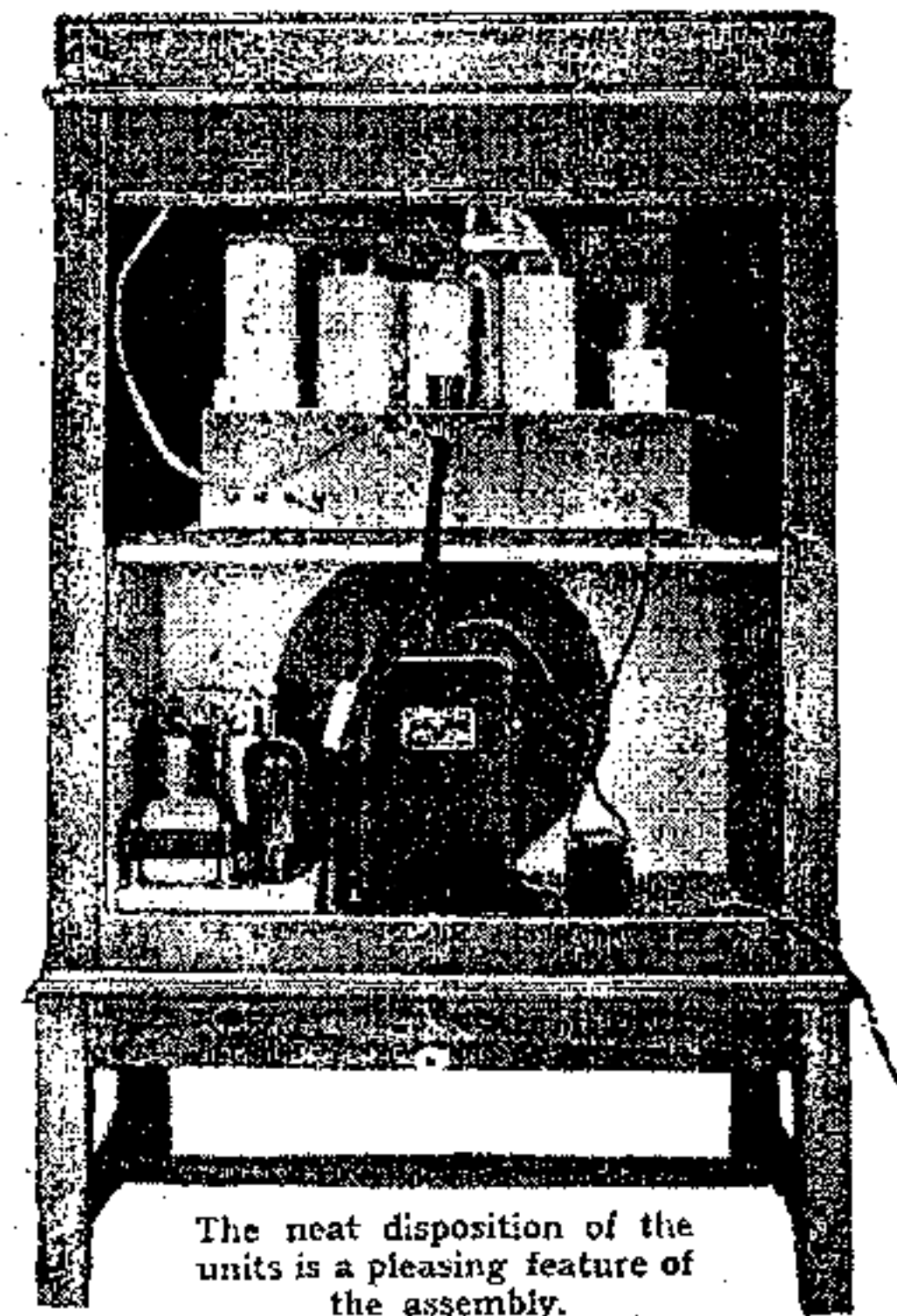
Controls.—(1) Single tuning control with illuminated dial. (2) Combined wave-change and radio-gramophone switch. (3) Combined dual volume control and mains on-off switch. (4) Tone control operative on both radio and gramophone. (5) Tone control on gramophone only.

Suppliers.—Whiteley and Selfridge, London.

Price.—60 guineas.

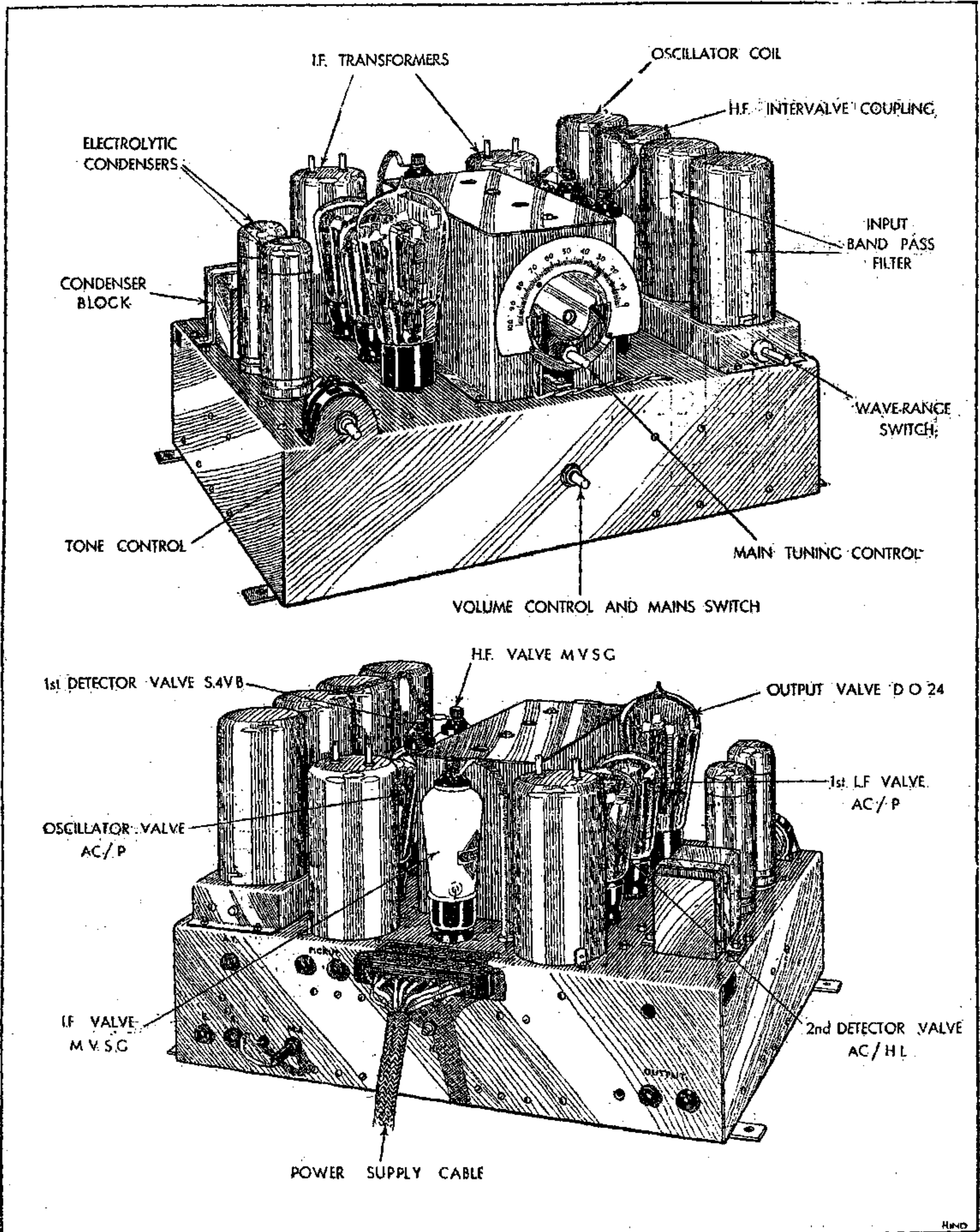
coupled to the detector, the anode circuit design of which follows standard practice, and in its grid circuit is included the first tone corrector. This consists simply of a 0.0001 mfd. grid condenser shunted by a 2 meg. resistance with a further 1 meg. resistance connected between the grid of the valve and earth, and it affords a compensation ratio of about 3-1 in favour of the upper frequencies.

A switch connected to the grid of this



The neat disposition of the units is a pleasing feature of the assembly.

"STENODE" RECEIVER WITH TWO STAGES OF TONE CORRECTION.



The receiver chassis in which unusually complete screening is employed.

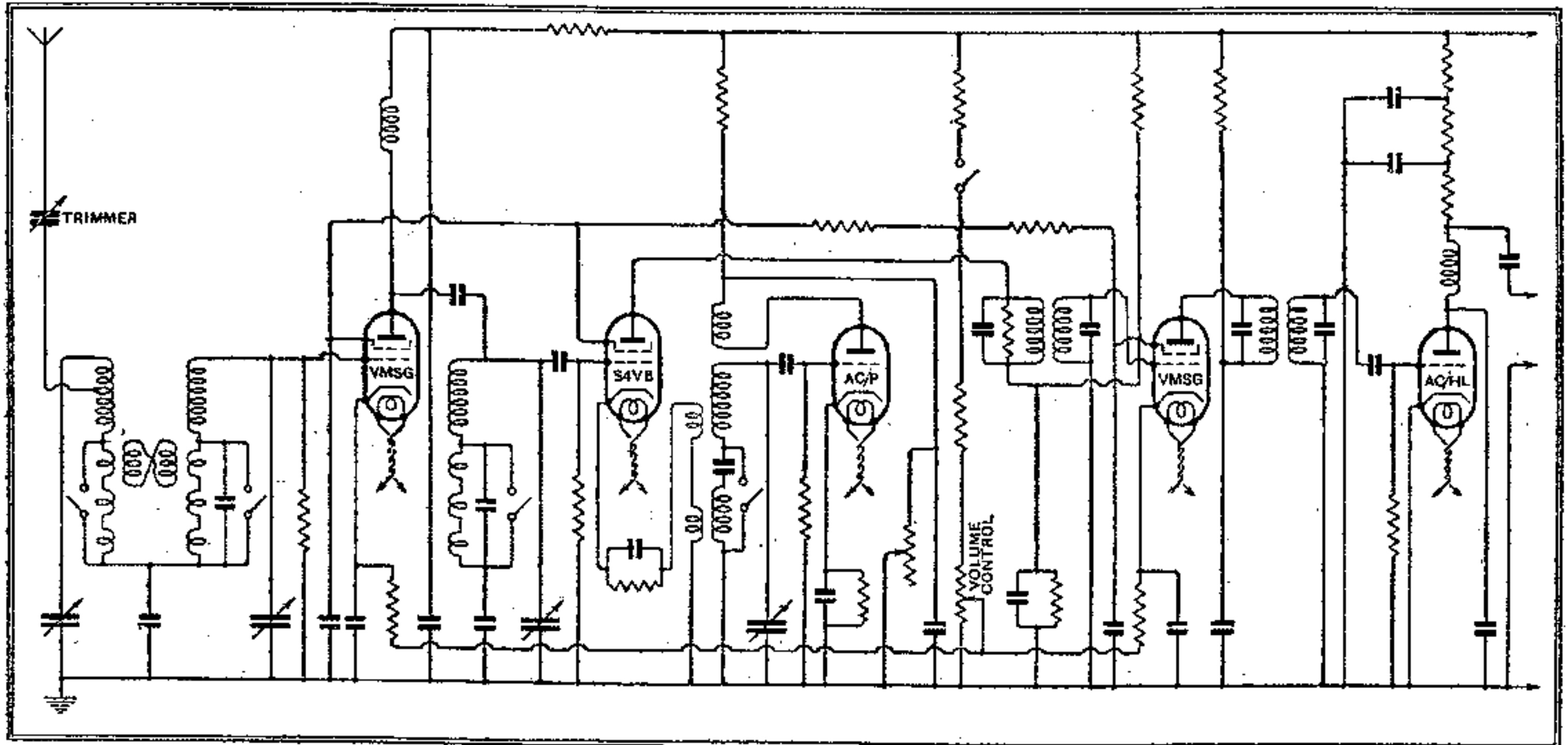
HIND

The Stenode Receiver.—

valve allows of a change over to a gramophone pick-up, and automatically eliminates the tone corrector. The pick-up works through a 6-1 ratio transformer into its

The coupling between the first L.F. stage and the D.O.24 output valve is again by a high-quality shunt-fed transformer. Still further tone correction, however, is introduced by the shunt-feed circuit,

The moving-coil loud speaker has its field winding energised from the smoothing circuits, and is coupled to the output valve by a choke-fed transformer of suitable ratio. Bias for the output valve is is



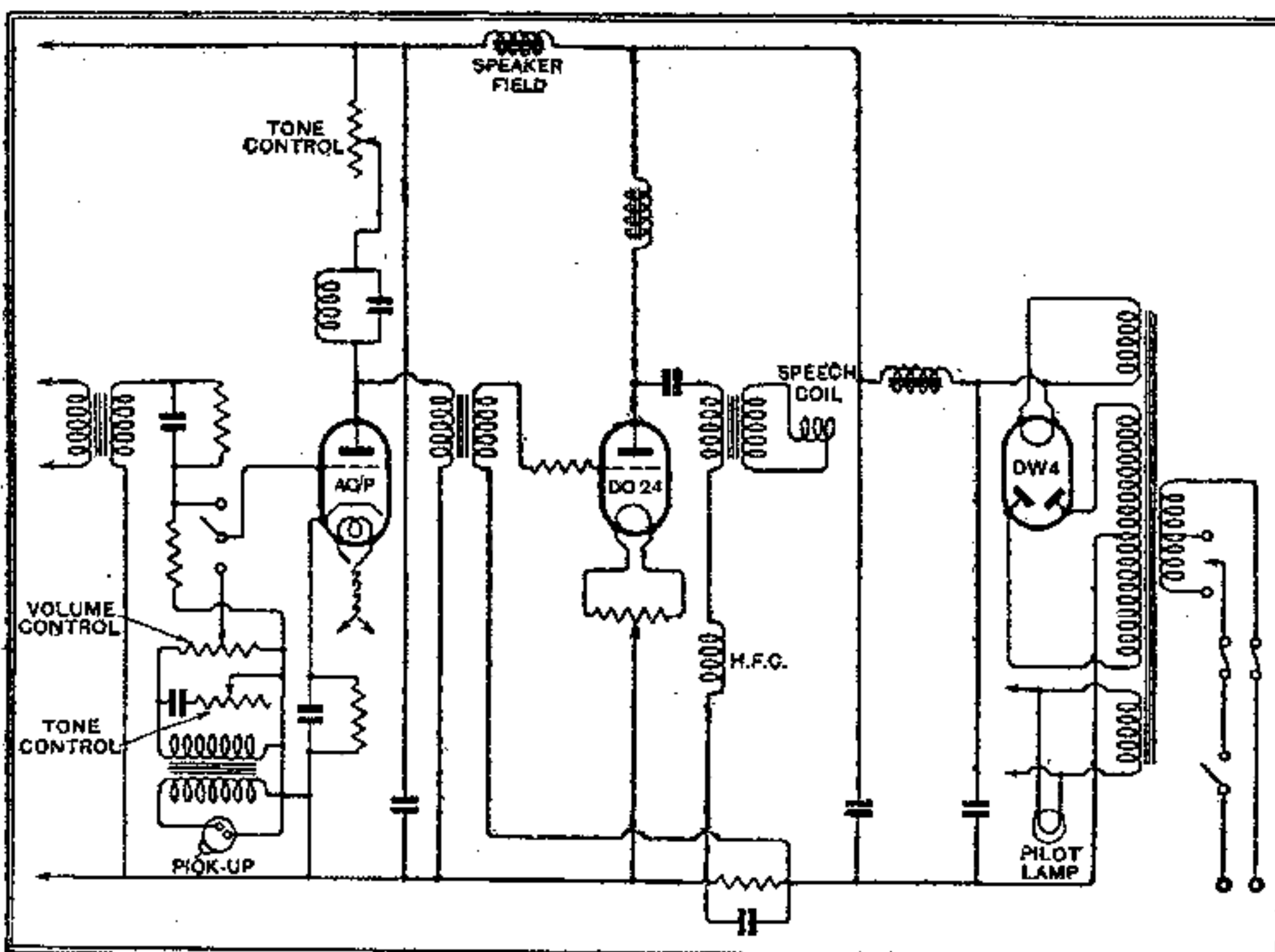
Circuit diagram of the Receiver. It will be noted that there are three pre-selector circuits which effectively prevent second-channel interference.

own potentiometer-type volume control, which is ganged to the radio control and operated by the same panel knob. A simple tone control circuit, operative on gramophone only, is connected across this transformer secondary, and it consists of a condenser in series with a variable resistance, the adjustment of which permits of the attenuation of the upper audible frequencies in order to eliminate needle scratch.

which consists of a parallel resonant circuit tuned to 4,100 cycles in series with a variable resistance which is panel-mounted as a tone control and is operative on both radio and gramophone. The operation of this tone control raises or lowers the response at the lower range of audible frequencies, while leaving the amplification of high frequencies unaffected, and enables quality of reproduction to be adjusted to individual preferences.

obtained from a resistance inserted in the common negative H.T. lead, and shunted by an electrolytic condenser. In the mains equipment a single choke affords preliminary smoothing in conjunction with two electrolytic condensers, and the smoothing for the early stages is completed by the speaker field, with which is associated still another electrolytic condenser.

The receiver is solidly built on a steel chassis, and the circuits are all thoroughly screened; the workmanship is of a high standard, and the set bears evidence of being built for lasting use. The mains equipment is assembled on a separate chassis, and is fitted, together with the loud speaker and the output transformer, into the lower compartment of the cabinet, which is lined with special sound-absorbent material. The polished walnut cabinet is of pleasing proportions, and of a style which harmonises well with most furnishing schemes.



Amplifier and tone correction stages and rectifier circuit.

Results.

The receiver has been thoroughly tested at a distance of nine miles from Brookmans Park, and with a moderately efficient aerial. As might be expected from a set of this type, the sensitivity proved ample for all ordinary requirements, and the weakest stations could be received at good volume, the limitation to enjoyable reception being set rather by the ratio of signal strength to background than by any lack of amplification.

The selectivity is of a very high order, and on the long waveband Königswusterhausen can be received without any trace