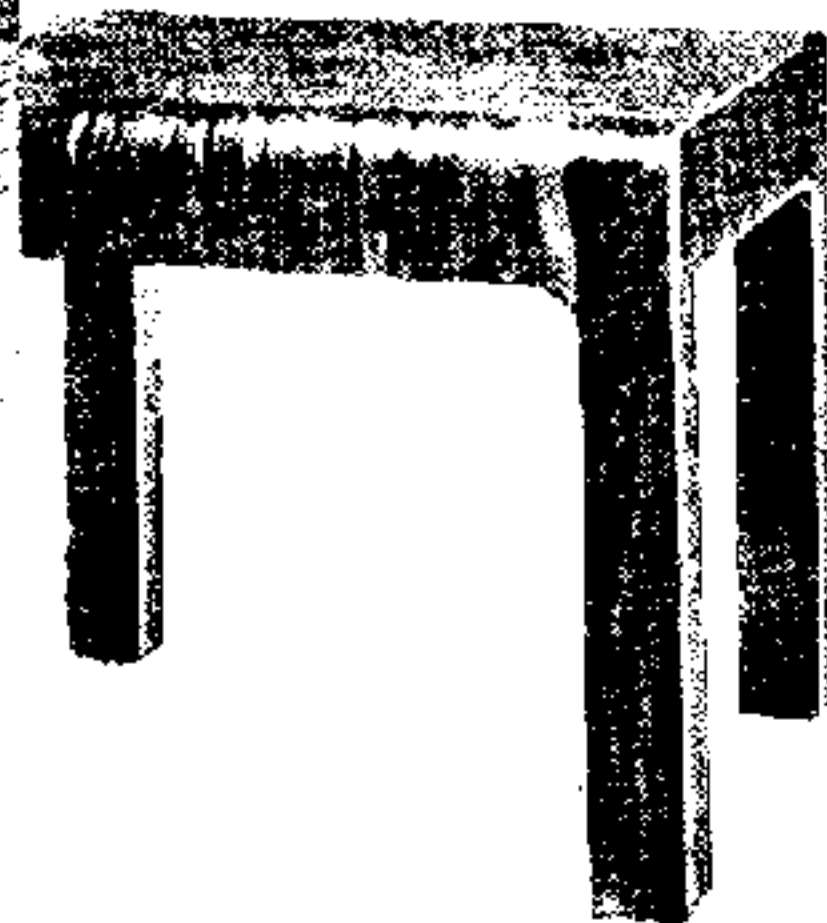
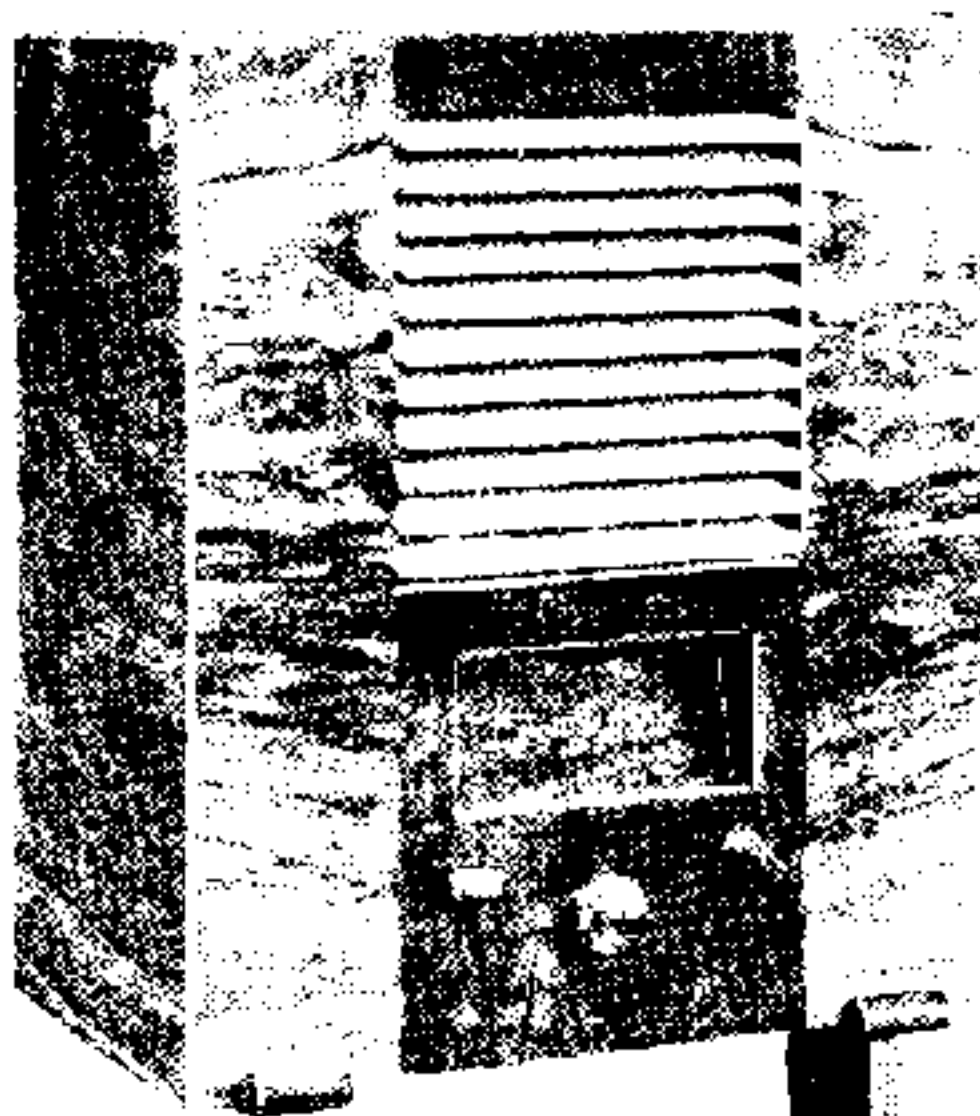




# Imperial

MODEL AD45

A SELF-CONTAINED FIRESIDE RECEIVER  
FOR AC OR DC MAINS



**FEATURES.** *Type.*—Self-contained transportable for AC or DC mains. *Circuit.*—Var.-mu pentode RF/AF amplifier—heptode frequency-changer—triode second detector with reaction—pentode output valve. Half-wave valve rectifier. *Controls.*—(1) Tuning. (2) Waverange. (3) Volume and on-off switch. (4) Tone. (5) Sensitivity (IF reaction). *Price.*—12½ guineas. \*Stand 31s. 6d. extra. *Makers.*—Betterset Radio Ltd., Clarendon Works, Montague Street, Worthing.

**T**HE sets made by this firm are notable alike for their neatness of cabinet design and for the originality of their circuits. In many ways the AD45 may be regarded as a grown-up mains version of the Model P23 "Baby" battery transportable reviewed in our issue of December 18th, 1936. It has the same style of cabinet, with louvered loud speaker fret, and the circuit is reflexed.

Separate frame aerials are used for medium and long waves, and the signal is first amplified at radio frequency by a pentode amplifier with tuned grid coupling to the octode frequency changer which follows. The usual IF transformer is connected in the anode circuit of this valve, both primary and secondary being tuned. No IF amplifier valve is, however, employed, but increased sensitivity is obtained by reaction from the second detector stage.

The valve employed for this purpose is a triode in which the grid functions as a

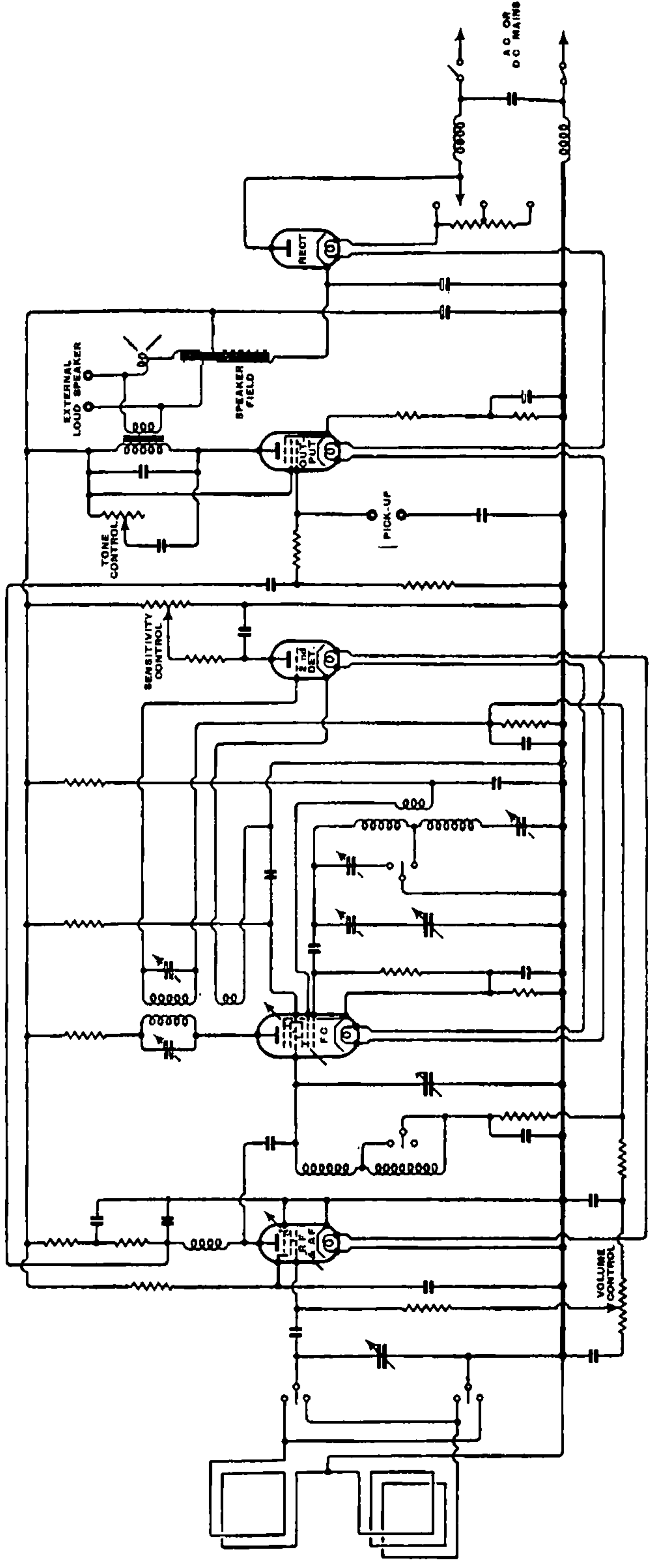
diode anode. The plate of the valve is supplied with HT from a potentiometer through a decoupling resistance, and is tied to earth as far as RF currents are concerned by a suitable by-pass condenser. An electron coupling circuit is thus formed, giving regeneration additional to that provided by the cathode coupling coil and providing a sensitive control. In the earth return circuit of the IF transformer secondary there is the usual diode load resistance across which are developed the AVC and rectified AF volts.

AVC is supplied to both the frequency-changer and the RF amplifier, but the constants of the filtering circuits differ so that the AF output is applied only to the grid of the first valve in the circuit. After amplification by this stage the AF voltage

is passed to the grid of the pentode output valve through a resistance-capacity coupling circuit. Beyond this point the circuit follows conventional practice with a variable tone control across the primary of the output transformer and the usual diode rectifier and smoothing circuit for the HT supply.

As in the case of the "Baby" battery portable, the chassis unit carries also the loud speaker and the frame aerials. These are mounted parallel to the sides of the cabinet and at right angles to their more usual position so that with the mass of the loud speaker further removed from the field of the coils an appreciable improvement in circuit efficiency is to be expected.

The set is entirely self-contained, and measures 15in. x 19in. x 11in. When used in conjunction with the special stand which has been designed for it, it makes an admirable fireside receiver for easy operation from the comfort of an armchair. The three principal controls of tuning, waverange, and volume are the only ones



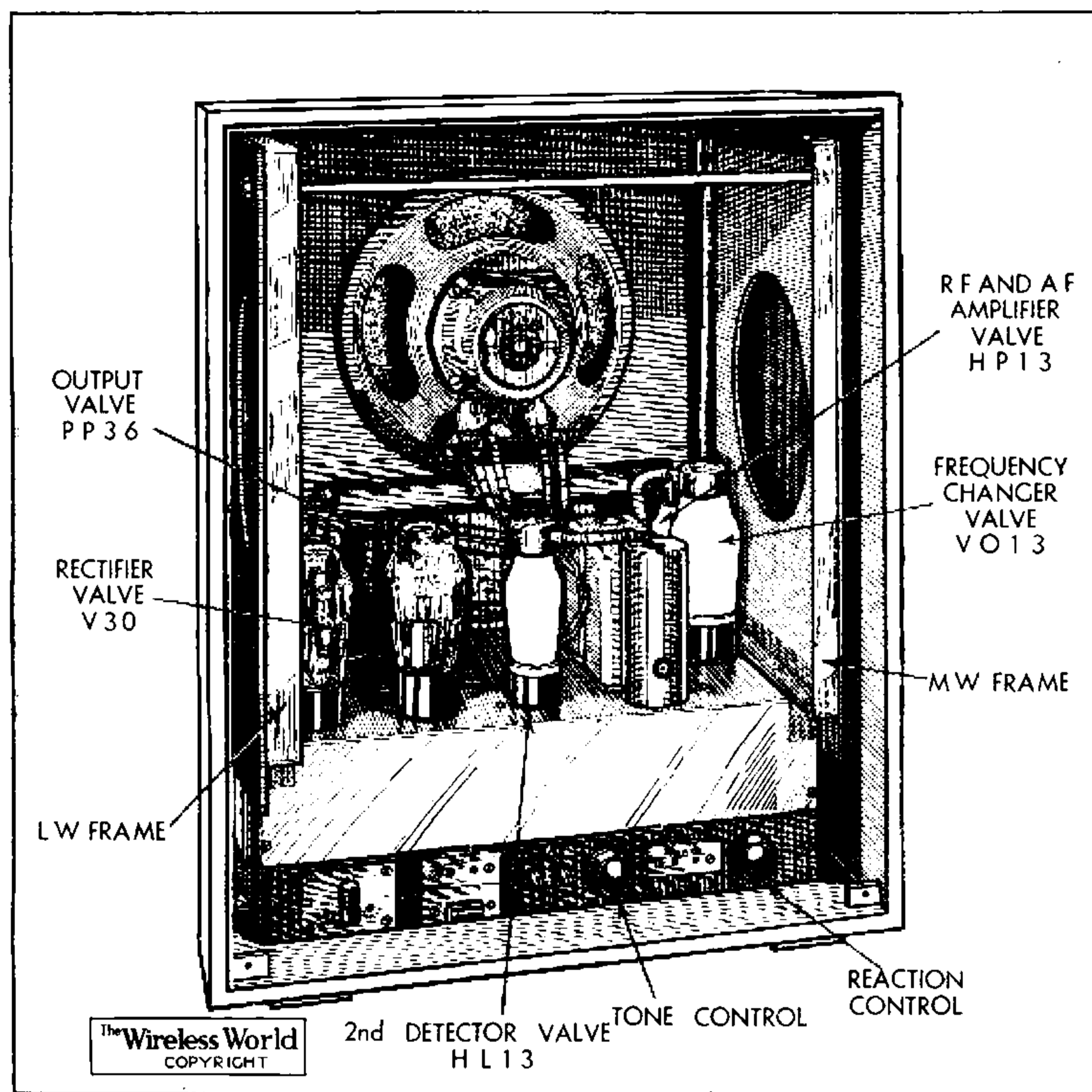
A reflexed input stage and a triode second detector arranged to give diode rectification with reaction, are unusual features of the superheterodyne circuit.

**Imperial Model AD45—**

accessible from the front of the cabinet. A neat rectangular tuning scale carries station names arranged on diagonal lines, and the shadow of the tuning point is

useful programme value in daylight. On the South Coast, of course, all these stations would rank automatically as first selection stations.

The directional properties of the frame



Loud speaker, frame aerials and chassis form a self-contained unit easily removed from the cabinet.

thrown on to the scale by a pilot light which travels with the pointer.

At the back of the set there are two controls, one for reaction on the IF transformer, which need only be used when pushing the set to its limits on distant stations, and the other a tone control, which, when adjusted to the taste of the listener's requirements, needs no further attention.

Excellent results as regards quality of reproduction were obtained with the tone control anywhere from the half-way mark to the position of greatest high-note response. There is plenty of real bass response unmarred by cabinet resonances, and tone in general is of a type which in a violin would be described as free playing. The volume can be increased well above the level normally required from a set of this type without any suggestion of overloading, and the input to the last stage from the principal continental broadcasts such as Fécamp, Luxembourg, and Radio-Paris is more than adequate to give the full output of which the set is capable. Stations such as Hilversum on the long waves and Cologne on the medium waves required some help from the sensitivity control before they could be regarded as of

aerial, due to the efficient AVC, are not very marked, so that help from this property cannot be relied upon as an aid to selectivity. On the other hand, it is gratifying to know that one need not necessarily orientate the set every time a fresh station is received, although a turntable is provided for this purpose. On long waves comfortable separation was possible between Radio-Paris and Droitwich, and on the medium waveband between two and three channels were lost on either side of the London Regional transmitter when using the set in Central London.

Without the advantage of the high signal-to-noise ratio which an outdoor aerial gives one generally expects to find a comparatively high level of background noise and switch clicks entering through the mains leads; but it will be seen from the circuit that filtering chokes have been included in both mains leads, and it is safe to say that the set is as quiet as this type of receiver can be made.

Provision is made for the attachment of a gramophone pick-up, but as the input is made directly to the grid of the output stage the high voltage output from a crystal type pick-up would seem to be called for.