

is to calibrate the meter so that the scale reads twice the actual current passing.

It will be found, however, that with such an arrangement there is a risk of
5 damaging the valve emission with large values of applied bias voltage. This is due to the fact that, whilst the anode is inoperative on the negative half cycle of the applied A.C. voltage, the grid is
10 positive with respect to the cathode and the grid-cathode system operates as a diode and passes current which can be very great with large values of applied grid volts.

15 Due to the fluctuating anode voltage, the correct test conditions would not be established by the application of a steady D.C. negative bias to the grid, as will be readily appreciated.

20 It is preferred, therefore, in carrying out the present invention to apply to the grid during the test not the full cycle of out-of-phase A.C. voltage, as above mentioned, but to cut out the positive half
25 wave of the applied grid voltage. This may quite simply be done by half-wave rectification. The rectified current should not be smoothed. Under these conditions, the voltage applied to the grid will have
30 the desired sine-wave form over the effective position and its peak value should

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now be $\frac{1}{.636}$ of the equivalent D.C. bias.

The apparatus according to the present invention comprises one or more trans-
35 formers adopted to provide the required A.C. voltages, a half-wave rectifier to remove the unwanted positive half-wave of the A.C. voltage applied to the signal grid, a meter to read the anode (or other
40 voltage carrying electrode) current and switches to vary the voltages applied to

the anode (or screen) and the grid. Preferably the switch for controlling the voltage applied to the grid is adapted to change the bias applied by steps equivalent to 1
45 volt D.C.

With the aid of such apparatus any of the characteristic curves of the valve under test can be blotted and mutual con-
ductance figures for any operating con-
50 ditions can be obtained from the change of anode current.

When testing valves with a plurality of anode systems, each system is tested separately, corresponding A.C. voltages
55 being, however, applied to the other anode system. In other words, any anode system not under test is not left open.

The apparatus also preferably includes means for testing the efficiency of rectifier
60 valves. The circuit is such that it enables the efficiency of the rectifier valve to be read under conditions of reservoir condenser load in terms of the total rectified current that can be taken from the anode.
65 For this purpose an A.C. voltage high enough to overcome the internal resistance of the valve and the curvature of the characteristic is applied to the valve with a reservoir condenser of, say, 8 mfd.
70 across the load. The shunt across the meter and the resistance in series therewith are set to predetermined positions according to the particular valve to be
75 tested, and the D.C. current passed by the load is read against a coloured scale so that if efficient rectification at the rated load current takes place the meter registers in the middle of the "good" portion of
80 the coloured scale. Each anode in the case of a full-wave rectifier is tested separately.

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COMPLETE SPECIFICATION

An Improved Method of and Apparatus for Testing Thermionic Valves

We, SYDNEY RUTHERFORD WILKINS, a British Subject, and THE AUTOMATIC COIL
WINDER AND ELECTRICAL EQUIPMENT
85 COMPANY LIMITED, a British Company, both of the Company's address at Winder House, Douglas Street, Westminster, London, S.W.1, do hereby declare the nature of this invention and in what
90 manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an improved method of and apparatus for testing thermionic valves.

In our prior Patent No. 480,752 we have described and claimed a method of testing and indicating the mutual con-
ductance of a radio valve which consists in applying the requisite volts to the fila-
100 ment or heater, applying an alternating current to the anode and measuring the change in anode current by a suitable