

equal to $1.4 \times$ the rated D.C. voltage.

The invention has the advantage over prior proposals in that A.C. current may be regulated with certainty and without the necessity of constant checking, and can be maintained substantially constant during the test. The invention, therefore, still further consists in apparatus for obtaining a direct reading of mutual conductance on a meter comprising means for feeding selected A.C. voltage to the valve anode, optional means for feeding selected A.C. voltage to the valve screens, means for feeding selected A.C. voltage to the valve filament or filament heater, a meter in the anode circuit, regulatable means for feeding half wave rectified current through a resistance in a reverse direction through said meter and means for feeding regulated direct current to the valve grid. The voltage leads are preferably suitably connected to a number of valve holders arranged on a panel thus enabling any type of valve to be plugged into an appropriate holder.

In order that the invention may be clearly understood, a practical embodiment is hereinafter more fully described by way of example. A number of tapings on a transformer secondary are connected to the contacts of a switch, the moving member of which is connected via a measuring instrument to the anode socket of a valve holder. A further series of tapings are similarly connected to a switch which is connected to the screen socket of the valve holder. One end of the secondary is connected with the filament and the cathode socket. A further secondary or a secondary on another transformer is tapped and the tapings connected to a switch which is in turn connected with the filament positive, whilst the free end of this winding is connected to the common filament cathode socket or to the connection thereto. A further transformer secondary through a rectifier and a variable resistance feeds reverse unsmoothed half wave unidirectional current to the meter. A variable resistance is arranged in shunt with the measuring instrument. Yet another transformer secondary in circuit with a rectifier is connected with a fixed potentiometer having a central point connected to cathode and so connected with a two way switch as to supply either +1 volt or -1 volt to a lead connected with the grid socket of the valve holder.

Whilst a single valve holder has been mentioned, the term is intended to include a number of valve holders arranged on a panel although a single holder and suitable adaptors may, of course, be used.

In operation, the valve to be tested is plugged into the valve holder and the requisite voltages applied thereto, i.e., in the ratio to the recommended D.C. voltage previously mentioned, by manipulation of the several switches. These switches are preferably so marked that when the pointers are set to the makers recommended figures for D.C. voltage, the requisite A.C. voltages are applied. With the grid switch supplying -1 volt, the anode current reading on the meter is noted with the latter shunted to 100 mA full scale by operation of the variable resistance in shunt with the meter. The standing anode current is now suppressed by supplying the meter with suitable reverse current under control of the other variable resistance. The meter is now shunted to 10 mA and the grid switch is next turned to +1 volt. The meter now shows only the increase in anode current on a 10 mA scale since the original current has been backed out. Thus the mutual conductance is read directly from the meter scale. Alternatively, the variable shunt resistance may be so adjusted that the meter gives full scale deflection for the correct mutual conductance of the valve under test. The percentage "goodness" of the valve under test will be shown upon the meter scale which can be marked with suitable colours denoting "good," "bad," "indifferent" or the like.

Rectifying valves, of course, have no mutual conductance, but these can be tested by applying a suitable A.C. potential to the anode, and noting whether the rectified D.C. current on the meter is up to standard. Similarly with diode detector valves. Where more than one electrode system is contained in one envelope, these are tested separately by switching the meter from anode to anode by a suitable two way switch.

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