grid voltage is changed from $-\frac{1}{2}$ to $+\frac{1}{2}$ volt D.C. or from $\frac{1}{2}$ volt R.M.S. out of phase to $\frac{1}{2}$ volt R.M.S. in phase then the mutual conductance obtained is half the correct value. If the grid change is doubled, thus making the change from 1 volt R.M.S. out of phase with the anode volts to 1 volt R.M.S. in phase, the mutual conductance figure obtained is substantially correct.

The present invention therefore comprises a method of testing and indicating the mutual conductance of a radio valve which consists in applying the requisite volts to the filament or heater, applying to the anode an alternating voltage and measuring the change in anode current by a suitable meter after impressing equal and opposite potentials on the grid, characterised in that the voltages applied are related to the meter scale on the basis that when the meter scale is based on milliamp readings the following voltages are applied, viz., (1) alternating voltage on the anode, the R.M.S. value of which is equal substantially to 1.4 times the rated D.C. voltage, and (2) grid potentials differing by an amount equal substantially to twice the difference of the normally accepted D.C. grid voltages; so that the meter reading indicates a proportion of the actual published mutual conductance figures.

Thus, if the meter figures represent milliamps the R.M.S value of the alternating voltage applied to the anode under test will be 1.4 times the rated D.C. voltage, and the difference between the potentials applied to the grid will be twice the normally accepted grid voltage, e.g. these potentials may be -1 and $+1$ giving a difference of 2 since the normally accepted grid voltage is $-\frac{1}{2}$ and $+\frac{1}{2}$ giving a difference of 1.

Instead of (or in addition to) the meter indicating results by figures it may show the results otherwise. For example, a coloured scale marked good—indifferent—replace—may be used and the meter circuit will be shunted so that for each valve tested the full scale (or nearly so) will represent the published mutual conductance milliamp figure of the valve. The meter needle will then indicate a rough proportion of this figure. For example, if the published mutual conductance of a valve to be tested is 4, the meter shunt will be adjusted so that the full scale meter reading is 4 milliamps. The needle movement on test will then show whether the actual mutual conductance is full scale (i.e. 4) or roughly what proportion of full scale and the colours and words are applied according to the proportions considered allowable for good, indifferent, and replace.

According to a further feature of the invention, for all H.F. screen pentodes, screen grid valves and similar H.F. valves an alternating voltage is applied to the screens, the R.M.S. value of which equals the rated D.C. voltage, whilst for the screening grids of L.F. pentodes there is applied an alternating voltage equal to 1.4 times the rated D.C. voltage.

The invention further consists in apparatus for obtaining a reading of the mutual conductance of a thermionic valve on a meter in the anode circuit having means for feeding selected alternating voltage to the valve anode, means for feeding selected voltage to the valve filament or filament heater, and A.C. winding or D.C. voltage supply for applying equal and opposite potentials on the grid said winding or voltage supply being separate from the filament or heater circuit, and means for varying the voltage applied to the filament or heater without appreciably affecting the voltage applied to the grid.

These and other important features of the invention will be hereinafter described and defined in the appended claiming clauses.

An embodiment of the present invention will be described by way of example with reference to the accompanying drawings wherein:—

Figure 1 shows the circuit diagram of a measuring instrument made in accordance with the invention,

Figure 2 illustrates the construction of a former for a resistance winding marked V2 in Figure 1,

Figure 3 illustrates the construction of the former for the resistance winding marked V1 in Figure 1,

Figure 4 is a graph of the resistance characteristic which would need to be given to a simple series resistance if it were used in place of either of the resistances V1, V2.

Figure 5 shows in diagrammatic form the operation of the circuit arrangement of the part designated MA/V in Figure 1, whilst

Figure 6 illustrates the shape of the former on which the variable resistance element in MA/V is wound.

The electrodes of the valve to be tested are connected to appropriate terminals N*x*, D2, D1, A2, L, G*d*, LT –, LT +, DX, on the instrument. N*x* is for screen current supply; D2, D1, A2, and L, for anodes according to the type of valve; G*d* for the grid; LT – and LT + for the filament and DX for the cathode of an indirectly heated valve. These terminals are preferably suitably connected to a