number of valve holders arranged on a panel thus enabling any type of valve to be plugged into an appropriate holder.

The sockets for taking the valves to be tested may be disposed on a panel separate from the measuring instrument and the panel embodies sockets for a number of different types of valves. The valve panel is connected to the measuring instrument by means of a suitable plug and socket of known type which consequently need not be described here. The provision of a separate panel has the advantage that it allows the instrument to be adapted readily for any new type of valves that may be developed.

Nx is connected to a rotary switch *Sc* for selecting the voltage required for the screen. D2, D1, A2, and L, are connected to an anode selector switch AS for selecting the appropriate electrode to be tested. *Gd* is connected to a source of current through a switch whereby the phase can be varied at will; and LT−, LT+, are connected to an alternating current supply variable by means of a switch H. DX is normally connected to LT−. The anode current is selected by the switch *An*. The required results are shown by the milliammeter ME.

The instrument has a pair of input terminals 50, for plugging in to any suitable A.C. supply circuit. The instrument can be disconnected by disconnecting these terminals from the supply circuit or by means of a switch *Sw*. The terminals 50 are connected within the instrument to the primary windings *Mp*, *Lp*, of two transformers M, L. A.C. voltages obtained from these transformers are applied to all valve electrodes although it is within the scope of the invention to apply D.C. to the grid, and normally changing this from −1 volt D.C. to +1 volt D.C. If desired, such D.C. current may be obtained from an A.C. tapping connected to a rectifier and potentiometer, the latter having a central point connected to a cathode and so connected with a two-way switch as to supply either +1 or −1 volt D.C. to a lead connected with the grid terminal.

The various A.C. voltages for supplying the filament (or heaters), anode, and, if necessary, screen of the valve to be tested are obtained as hereinbefore stated through three rotary switches marked H (heater), *An* (anode) and *Sc* (screen) respectively. The voltages which can be obtained from each one of these switches are marked on the panel of the instrument and are so arranged that suitable electrode voltages can be obtained for testing practically any standard valve.

Although the voltages marked on the panel for the anode switch are 80, 100, and so forth, the instrument parts are so arranged that the actual measured A.C. voltages applied to the anode of the valve are 1.4 times the figures marked. When the switch is set according to the D.C. operating potentials as recommended by the makers, the correct A.C. potential for purposes of test will be automatically applied.

The primary winding *Lp* is tapped at various turns as indicated at *Lx* in such a manner that it may be connected to A.C. supply mains of various voltages from 200 to 250 volts by adjustment at *Ly*. Connected in parallel with the primary winding *Mp* is a neon lamp N in series with a 0.25 megohm resistance and an "on and off" switch *Na* which is normally closed. Two pin sockets S, S are disposed near the switch *Na* in a manner such that when the two plugs to be mentioned later, are inserted into the sockets S, S the switch *Na* is opened. As will be explained later, the purpose of the neon lamp is to serve as an indicator lamp to show when the instrument is switched on and also to serve as a continuity and an insulation tester.

Two leads terminating in plugs at one end and clips at the other are provided; and when a resistance is connected across the clips on the leads, the plugs being inserted in the sockets S, the circuit is once more continuous and the lamp lights, the strength of the glow depending on the amount of resistance in circuit. This forms a useful test for filament continuity or inter-electrode shorts. It is merely necessary to insert the plug leads and connect the clips across the pins of the valve base under test when complete lighting of the lamp will show continuity in the case of a filament test, or partial lighting will show insulation breakdown in the case of an inter-electrode test.

The transformer L has four secondary windings *Ls1*, *Ls2*, *Ls3*, *Ls4*, of which winding *Ls1* is suitably tapped to give the various voltages indicated at H which are customarily used for the filament or heaters of valves to be tested.

Secondary *Ls2* is wound to give 140 volts across its complete winding and is tapped at 30 volts. One end of this winding is connected to a contact 100 of the anode multi-contact switch *An* whilst the 30 volt tapping is connected to a second contact, marked REC 30 on the same switch through a resistance of, say 75 ohms. The other end of winding *Ls2* is connected to one end of the secondary winding *Ms* of transformer M and to a centre tap of the third secondary *Ls3* of the transformer L. This winding *Ls3* has one end marked + and the other −. The + end is connected to a pair of change-