accurate calibrations of the points F and G. It is essential that these positions are accurate because they represent the scale on which rectifier emissions—measured as described later—are read, and the scale on which direct mutual conductance is read respectively. The variable resistance GH is calibrated at useful intervals from 10 to 1. These calibrations are used with the coloured meter scale for comparison tests. For instance, if a valve has a mutual conductance of 4 mA/V, after the initial backing off, the mutual conductance scale is set to position 4 which shunts the meter so that it reads about 15% greater than 4 mA full scale. If now the grid potential is changed as above described the position of the meter pointer on the coloured scale will indicate the valve as good, bad or indifferent, according to the percentage its mutual conductance differs from 4. Similarly for other values of mutual conductance.

Owing to the steep change of slope of the curve governing the relation between angular rotation and current deflection, for the variable universal shunt GH, it will be appreciated that a linearly wound former having a constant cross-section strip would not be easy to handle. Assuming that the minimum setting was 1 mA, the setting for 2 mA would represent about 50% of the total rotation of the control and the settings for 5—10 mA would be crowded into the last 20% of rotation.

Accordingly, a similar device to that which was used in the backing off control, has been adopted. The resistance strip is wound on a former shaped as shown in Figure 6 and the resistance wires chosen are such that the full scale deflection/angular rotation characteristics, although not being linear is uniform enough for ease of handling. By the example shown in Figure 6 the strip is divided into two sections O.P of which O is three inches whilst P is two inches long. The parts O and P may be wound respectively with 28 and 36 gauge enamelled Eureka wire. The maximum width of this strip may be half an inch. It will, of course, be understood that these dimensions as those given for V1 and V2 are by way of example only.

The method of operation is as follows:—

First test the valve for electrode shorts. As previously described, for this purpose two leads are supplied, one terminating in a crocodile clip and the other in a short prod. These leads are plugged firmly into the sockets S (Figure 1). If now the crocodile clip be clipped on to the anode pin of the valve and the prod touched on the other pins in turn, the neon light (N) will light if leakage is present between the anode and any other electrode. With valves such as pentodes, in which high voltage is applied to the screen, this process should be repeated with the clip lead clipped on to the screen pin. The strength of the neon glow will indicate the amount of leakage present. This test is important and should be applied before the valve is inserted in the tester as a short between anode or screen and another electrode might cause excessive current to be taken from the tester. The above test can also be utilised for testing filament continuity as previously described and when the testing leads are not inserted in the sockets (S) the neon lamp merely serves as an indicator to show when the instrument is switched on.

Next, consult a data chart to ascertain the correct electrode voltages to be applied to the valve, and the valve holder into which it must be inserted. Then with the instrument switched off, these voltages should be selected on the appropriate switches H, An and Sc respectively, before the valve is connected with the appropriate terminals.

The MA/V control should be set to 100 and, in the case of triodes, screen grid valves and pentodes, the anode selector AS should be set at "normal."

Now with the valve connected, and the instrument switched on, the meter needle will rise, indicating the initial anode current of the valve. This current should be backed off to zero by means of the control marked V and the MA/V control then turned to the position marked G (Fig. 5). The control V can now be finally adjusted so that the meter reads zero accurately. If now the key of the two-way switch is pressed in the direction marked M.C., the meter needle will rise and indicate on the scale (calibrated 0—10) the mutual conductance of the valve in milliamps per volt. This can be compared with the figure given by the manufacturers for a good valve.

An alternative method of testing the comparative goodness of a valve is as follows:—When the initial current of a valve has been backed off to zero, consult the chart and note the mutual conductance figure given. The MA/V control should now be set to this figure and the meter needle set accurately to zero. The full scale (or nearly so) of the meter now represents the same number of milliamps as the mutual conductance number of the valve set on the MA/V control. If now the key aforesaid is pressed in the direction "M.C." the position of the needle on the coloured scale will show the valve as good—indifferent—or replace. If the