

## PATENT SPECIFICATION



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## PROVISIONAL SPECIFICATION.

## Improvements in and relating to Adaptors for use with Valve Testing Instruments.

We, SYDNEY HERBERT RAWLINGS, a British Subject, of Winder House, Douglas Street, London, S.W.1, and EDWARD MILLS, a British Subject, of 132, 5 Palmers Road, New Southgate, London, N.11, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in adaptors for use with valve testing instruments. Valve testing apparatus may be broadly divided into two classes, firstly, that in which the valve to be tested is removed from the set and plugged into the testing instrument, the testing instrument being connected by suitable flexible leads to an adaptor which is plugged into the valve holder from which the valve has been removed, and secondly, that in which the valve is removed from its socket and plugged into the adaptor itself which is plugged into the valve holder, the adaptor in this case being provided with flexible leads to connect the same to the appropriate testing instruments.

Now at the present date the plug and socket fittings of valves are not all standardised, for example, there are four pin and five pin valves, both of the American and British types (in which the pin disposition is different), and in certain cases, for example, screened grid valves and indirectly heated pentode valves, there is one or more terminals carried by the bulb or the base of the valve itself to which a connection must be made, and it is, therefore, the chief object of the present invention to provide an adaptor to enable any type of valve to be readily tested.

The adaptor, according to the present invention, is, therefore, provided with one or more sets of pins so disposed and arranged that the same may be plugged into any type of valve holder.

In one convenient form of the present invention, the adaptor is provided with the usual four pins suitably spaced apart and, in addition, is provided with a fifth or central pin which can be slidden into and out of the adaptor for use with five-pin valves.

In a further form of this invention,  
[Price 1/-]

the adaptor is provided with a plurality of sets of pins spaced apart so that one set fits a four-pin valve holder, a further set fits a five-pin valve holder, and further similar sets are provided for the two types of American valves.

Describing now one suitable form of adaptor according to this invention, the device comprises a base of ebonite or other suitable insulating material provided on its underside with four pins suitably spaced to take into a four-pin valve holder. Flexible leads are connected to these pins and lead to the testing instrument which is, of course, provided with the usual meters. A central pin is also provided, this pin being slidable in a central hole in the base so that when the adaptor is to be used in connection with the testing of four-pin valves, this fifth pin can be slidden into the hole and thus be disposed out of the way. On the other hand, when it is desired to test a five-pin valve, the fifth pin is slidden out to the required extent, and takes, of course, into the central socket in the holder. A clamping screw is provided to clamp the fifth pin in any desired position, and the connection for this fifth pin is taken from this clamping screw. The multiple flex for the adaptor also includes one or more leads for connection to the extra terminals of valves having terminals either on the bulb or on the cap, for example, screened grid valves and indirectly heated pentode valves.

A cover may, if desired, be provided to take over the upper face of the adaptor.

It will be appreciated that, due to the different disposition of the pins on the caps of valves of American and British types of valves, an adaptor such as that described above can only be arranged for use with one of the said types of valves. Of course, by a suitable spacing of the pins it can be adapted for British or American valves.

The adaptor according to the present invention may also be adapted for use in that system of valve testing in which the valve is removed from its holder and plugged into the adaptor which takes the place of the valve in the holder. In

this case, the upper surface of the adaptor is provided with the appropriate sockets to receive the valve pins. The fifth or central pin may for this form comprise a split pin slidable in a brass or like sleeve to which the connection is made. This fifth pin will be pushed down in its sleeve by the fifth pin of the valve when the adaptor is used with five-pin valves to make connection with the fifth socket of the valve holder, and when the adaptor is used with four-pin valves, will be either pushed back into its socket by the insulation of the valve holder, or will be free if the holder is of skeleton formation. Alternatively, the fifth pin in the adaptor may be pressed back by hand. Leads are provided in the manner described above to connect the adaptor and hence the valve to the appropriate testing instruments.

In a modified form of this invention, the adjustable fifth pin may be dispensed with, and the adaptor provided with sets of pins on its upper and lower faces. One set would, in this case, comprise the usual four pins to take into a four-pin valve holder, and the other set would comprise the usual five pins. A cover may be provided to take over that set of pins which is not in use, in order to prevent shock,

such cover either being screwed on to the adaptor or being provided with five sockets to take friction-tight over the pins of either set, and thus insulate the same. This form may be made either for the British or American types of valves

In a still further form of this invention, a universal type of adaptor for use with four or five-pin valves of the British or American types may be provided. In this case, the adaptor is provided with four sets of pins, each adapted to take into one type of valve holder, the pins being connected together appropriately within the adaptor and to the leads from the adaptor to the testing instruments. Covers may be provided for any or all of the sets of pins not in use, in order to prevent all chance of shock during use.

The adaptors according to the present invention may be made in any suitable manner, and modifications and alterations of the constructional features may be made without departing from the scope of the present invention.

Dated the 19th day of February, 1932.

GEE & Co.,

Patent Agents,

Staple House, 51 and 52, Chancery Lane,  
London, W.C.2,

Agents for the Applicants.

## COMPLETE SPECIFICATION.

### Improvements in and relating to Adaptors for use with Valve Testing Instruments.

We, SYDNEY HERBERT RAWLINGS, a British Subject, of Winder House, Douglas Street, London, S.W.1, and EDWARD MILLS, a British Subject, of 132, Palmers Road, New Southgate, London, N.11, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in adaptors for use with valve testing instruments. Valve testing apparatus may be broadly divided into two classes, firstly, that in which the valve to be tested is removed from the set and plugged into the testing instrument, the testing instrument being connected by suitable flexible leads to an adaptor which is plugged into the valve holder from which the valve has been removed, and secondly, that in which the valve is removed from its socket and plugged into the adaptor itself which is plugged into the valve holder, the adaptor in this case being provided with flexible leads to connect the

same to the appropriate testing instruments.

Now at the present date the plug and socket fittings of valves are not all standardised, for example, there are four pin and five pin valves, both of the American and British types (in which the pin disposition is different), and in certain cases, for example, screened grid valves and indirectly heated pentode valves, there is one or more terminals carried by the bulb or the base of the valve itself to which a connection must be made, and it is, therefore, the chief object of the present invention to provide an adaptor to enable any type of valve to be readily tested.

The adaptor, according to the present invention, is, therefore, provided with one or more sets of pins so disposed and arranged that the same may be plugged into two or more different types of valve holder.

In one convenient form of the present invention, the adaptor is provided with the usual four pins suitably spaced apart

and, in addition, is provided with a fifth or central pin which can be slidden into and out of the adaptor for use with five-pin valves. Alternatively, the central pin may be fixed and the other pins slidden as required.

In a further form of this invention, the adaptor is provided with a plurality of sets of pins spaced apart so that one set fits a four-pin valve holder and a further set fits a five-pin valve holder. If desired, further similar sets may be provided for the two types of American valves.

With a view to facilitating the mounting of thermionic valves and other interchangeable radio devices having pins in holders which have variously disposed sockets and, in order to mount thermionic valves in holders, the socket disposition of which does not correspond with the pin disposition on the valve cap, it has been proposed to provide an adaptor usually in the form of a ring which is disposed intermediate of the thermionic valve and the holder, such adaptor being provided with contacts which make contact with those pins on the valve cap which are not capable of insertion in the sockets of the holder. Such prior devices differ from the adaptor according to the present invention, firstly, by reason of the fact that they are not applicable for use with testing apparatus of the type above referred to and, secondly, by reason of the fact that the adaptor itself is not provided with one or more sets of pins so disposed and arranged that the same may be plugged into two or more different types of valve holder. To such devices we make no claim.

In order that this invention may be the more clearly understood and readily carried into effect, we will proceed to describe the same with reference to the accompanying drawings, which illustrate by way of example and not of limitation one convenient embodiment of this invention as applied to valve testing apparatus of the type in which the valve (four pin or five pin) is removed from its normal position and plugged into a testing device, and in which

Figure 1 is a perspective view of the complete testing device and adaptor.

Figure 2 is a central vertical section through the adaptor, and

Figure 3 is a view similar to Figure 2 showing a modified form of adaptor according to this invention.

Referring now to Figures 1 and 2 of the drawings, the testing apparatus shown therein comprises a valve holder *a* carried by a suitable base *b* which is provided with terminals *b*<sup>1</sup>, *b*<sup>2</sup>, *b*<sup>3</sup>, *b*<sup>4</sup>, *b*<sup>5</sup>, *b*<sup>6</sup>,

*b*<sup>7</sup> and *b*<sup>8</sup>, and a three-way switch *c*. The underside of the base *b* is hollow, and the terminals *b*<sup>1</sup> to *b*<sup>8</sup> are connected within the hollow underside of the base as follows; the terminal *b*<sup>1</sup> to one of the filament or heater sockets *a*<sup>1</sup> of the valve holder *a*, the terminal *b*<sup>2</sup> to the cathode socket *a*<sup>2</sup> of the valve holder *a*, the terminal *b*<sup>3</sup> to the grid socket *a*<sup>3</sup>, the terminal *b*<sup>4</sup> to the other filament or heater socket *a*<sup>4</sup>, the terminal *b*<sup>5</sup> to the anode socket *a*<sup>5</sup>, and the terminal *b*<sup>6</sup> to a flexible lead *d*. The two terminals *b*<sup>7</sup> and *b*<sup>8</sup> are connected to insulated moving contacts or arms (not shown) on the switch *c*, and this switch, as above explained, is provided with three definite effective positions, each separated by an off position. The fixed contacts of the switch *c* comprises three pairs of contacts which are normally in contact with one another but which are separated by the arms of the switch *c* when in the appropriate position to insert across the pair of contacts in question anything connected to the terminals *b*<sup>7</sup> and *b*<sup>8</sup>. The terminals *b*<sup>7</sup> and *b*<sup>8</sup> are intended for connection to a current measuring instrument, and in the position indicated by the numeral 3 in Figure 1, the measuring instrument is connected in the lead from the terminal *b*<sup>3</sup> to the grid socket *a*<sup>3</sup>, with the switch in the position indicated by the numeral 5 the current measuring instrument is connected in the lead from the terminal *b*<sup>5</sup> to the socket *a*<sup>5</sup>, and with the switch in the position indicated by the numeral 6, the current measuring instrument is connected between the terminal *b*<sup>6</sup> and the flexible lead *d*.

The testing instrument is also provided with a cable *e* having leads therein to connect the terminals *b*<sup>1</sup> to *b*<sup>6</sup> inclusive to the corresponding parts of an adaptor *f*. This adaptor *f* (see more particularly Figure 2) comprises a two part hollow casing, the two parts being held together by means of a hollow bolt or bush *g* and a nut *g*<sup>1</sup>. The lower part of the casing *f* carries four fixed pins *f*<sup>1</sup>, *f*<sup>2</sup>, *f*<sup>3</sup> and *f*<sup>4</sup> which, by means of the leads in the cable, are connected to the terminals connected to the normal four sockets *a*<sup>1</sup>, *a*<sup>2</sup>, *a*<sup>4</sup> and *a*<sup>5</sup> of the valve holder. A fifth pin *f*<sup>5</sup> is also provided, this pin being centrally arranged and slidable in the hollow bolt or bush *g*. This pin is provided at its upper end with an insulating knob *f*<sup>7</sup> by means of which it can be slidden up and down and is connected by a lead in the cable *e* to the terminal connected to the socket *a*<sup>3</sup> of the valve holder *a*. The flexible lead *d* passing out of the base *b* is connected, by means of a lead in the cable *e*, to a similar flexible lead *h* at the

adaptor end of the cable, and the flexible leads  $d$  and  $h$  are provided with crocodile clips  $d^1$  and  $h^1$  respectively. Clips  $j$  having outstanding knobs  $j^1$  may be provided on the cable  $e$  to anchor the free ends of the flexible leads  $d$  and  $h$  by means of the crocodile clips  $d^1$  and  $h^1$ .

When it is desired to use the testing instrument according to the present invention, the valve to be tested is removed from the set and plugged into the valve holder  $a$ . The adaptor  $f$  is plugged into the valve holder from which the valve has been removed. If this valve is a screen grid valve, the crocodile clip  $d^1$  is attached to the anode of the valve, and the crocodile clip  $h^1$  is attached to the lead to the anode within the set. In the case of a four pin valve, the pin  $f^2$  is raised, while, in the case of a five pin valve, for example, an indirectly heated valve, the pin  $f^2$  is depressed to make connection with the cathode socket of the valve holder.

With a current measuring instrument connected across the terminals  $b^7$  and  $b^8$ , the current flowing in the circuits, including the terminals  $b^3$ ,  $b^5$  and  $b^6$ , can be measured, thus giving the grid current, anode current and screen current. If an ordinary triode is being tested, the crocodile clips are clipped on to the pins  $j^1$ .

In order to measure voltages, a suitable meter is connected across the appropriate terminals.

It will be appreciated that, due to the different disposition of the pins on the caps of valves of American and British types of valves, an adaptor such as that described above can only be arranged for use with one of the said types of valves. Of course, by a suitable spacing of the pins it can be adapted for British or American valves.

The adaptor according to the present invention may also be adapted for use in that system of valve testing in which the valve is removed from its holder and plugged into the adaptor which takes the place of the valve in the holder. In this case, the upper surface of the adaptor is provided with the appropriate sockets to receive the valve pins. The fifth or central pin may for this form comprise a split pin slidable in a brass or like sleeve to which the connection is made. This fifth pin will be pushed down in its sleeve by the fifth pin of the valve when the adaptor is used with five-pin valves to make connection with the fifth socket of the valve holder, and when the adaptor is used with four-pin valves, will be either pushed back into its socket by the insulation of the valve holder, or will be

free if the holder is of skeleton formation. Alternatively, the fifth pin in the adaptor may be pressed back by hand. Leads are provided in the manner described above to connect the adaptor and hence the valve to the appropriate testing instruments.

In a modified form of this invention shown in Figure 3, the adjustable fifth pin  $f^2$  may be dispensed with, and the adaptor  $k$  provided with sets of pins on its upper and lower faces. One set  $l$  would, in this case, comprise the usual four pins to take into a four-pin valve holder, and the other set  $m$  would comprise the usual five pins. A cover  $n$  may be provided to take over that set of pins which is not in use, either a friction-tight fitting, or by means of a screw-thread, in order to prevent shock, such cover either being screwed on to the adaptor or being provided with five sockets to take friction-tight over the pins of either set, and thus insulate the same. This form may be made either for the British or American type of valves.

In a still further form of this invention, a universal type of adaptor for use with four or five-pin valves of the British or American types may be provided. In this case, the adaptor is provided with four sets of pins, each adapted to take into one type of valve holder, the pins being connected together appropriately within the adaptor and to the leads from the adaptor to the testing instruments. Covers may be provided for any or all of the sets of pins not in use, in order to prevent all chance of shock during use.

In a still further modified form of this invention, the central or fifth pin may be entirely removable.

The adaptors according to the present invention may be made in any suitable manner, and modifications and alterations of the constructional features may be made without departing from the scope of the present invention.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An adaptor for use with valve testing instruments provided with one or more sets of pins so disposed and arranged that the same may be plunged into two or more different types of valve holder.

2. An adaptor for use with valve testing instruments according to Claim 1, provided with a set of four pins and a fifth pin, the set of four pins and the fifth pin being relatively movable to adapt the adaptor for use with four or five valve holders.

3. An adaptor for use with valve testing instruments according to Claim 1, characterised in the provision of two sets of fixed pins, one set comprising four pins, 5 and the other comprising five pins, substantially as described.

4. An adaptor for use with valve testing instruments according to Claim 3, provided with a cover to take over that set 10 of pins not in use, substantially as described.

5. An adaptor for use with valve testing instruments according to Claim 1, provided with four sets of pins substantially 15 as described.

6. An adaptor for use with valve testing instruments according to Claim 1, com-

bined with a valve holder carried by a base having appropriate terminals for the connection of measuring instruments with or without a switch, substantially as 20 described.

7. The improved adaptors for use with valve testing instruments, substantially as hereinbefore described. 25

8. The improved valve testing apparatus, substantially as described and illustrated by the accompanying drawings.

Dated the 15th day of December, 1932.

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[This Drawing is a reproduction of the Original on a reduced scale.]

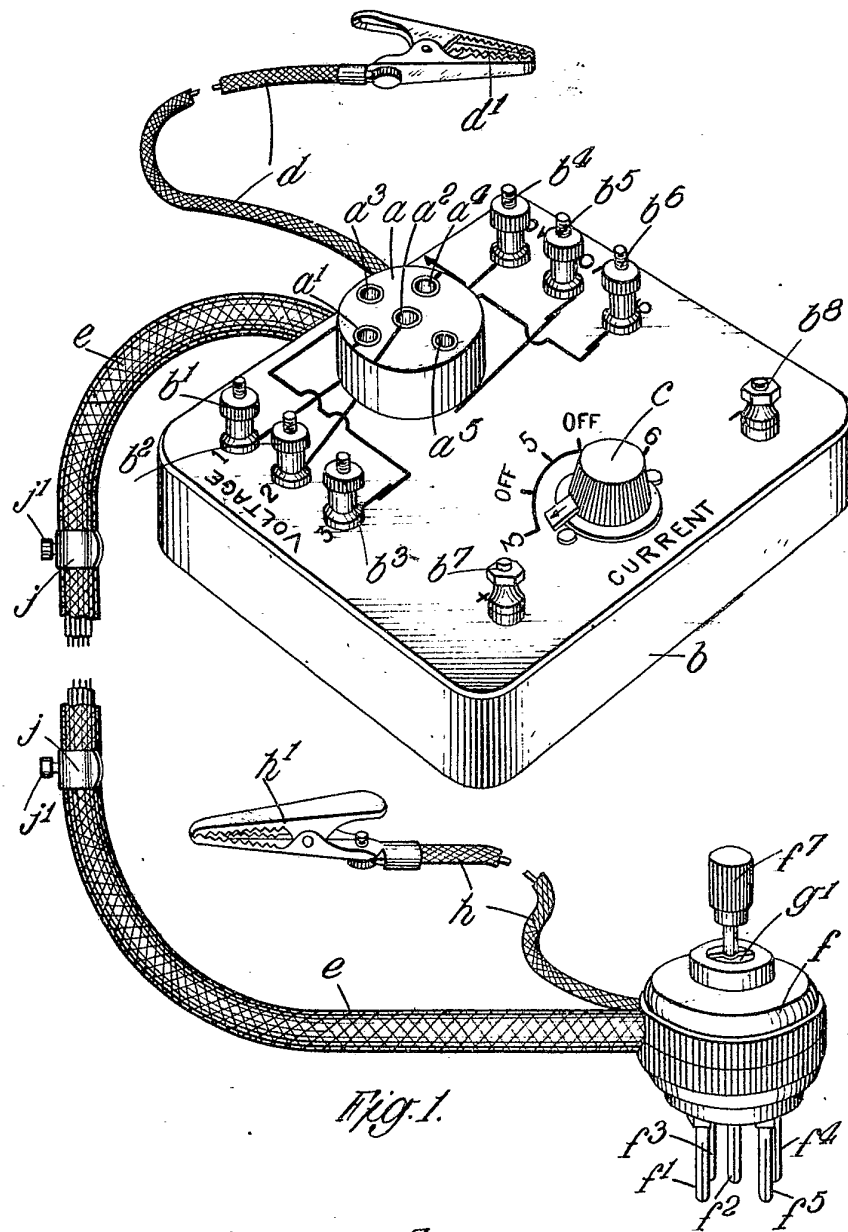


Fig. 1.

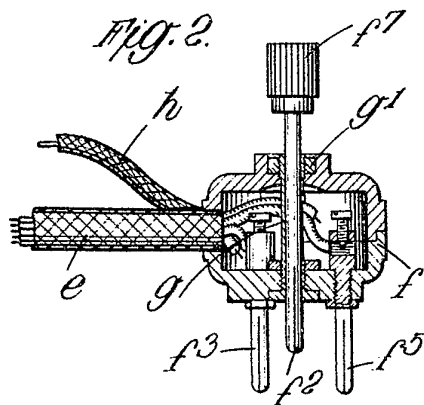


Fig. 2.

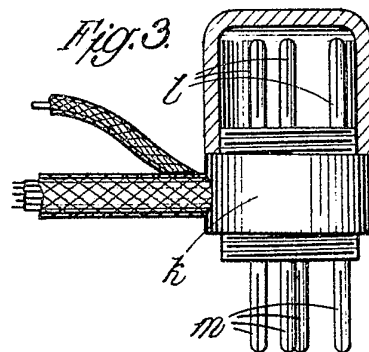


Fig. 3.