Jan. 3, 1950 S. T. DEAKIN 2,493,658

THERMIONIC VALVE HOLDER

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Fig.1.

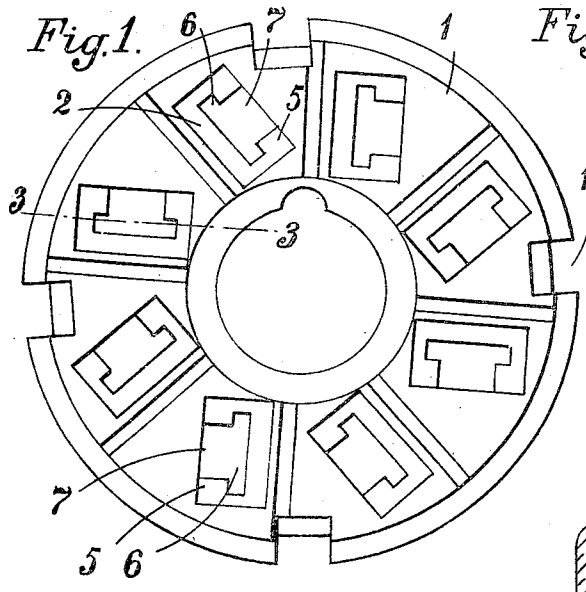

Fig.3.

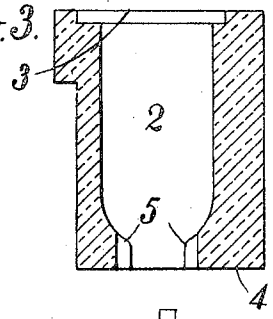

Fig.2.

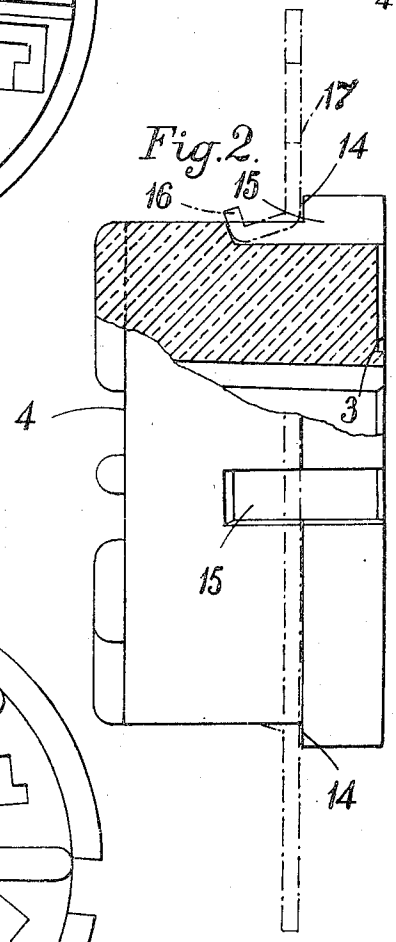

Fig.4.

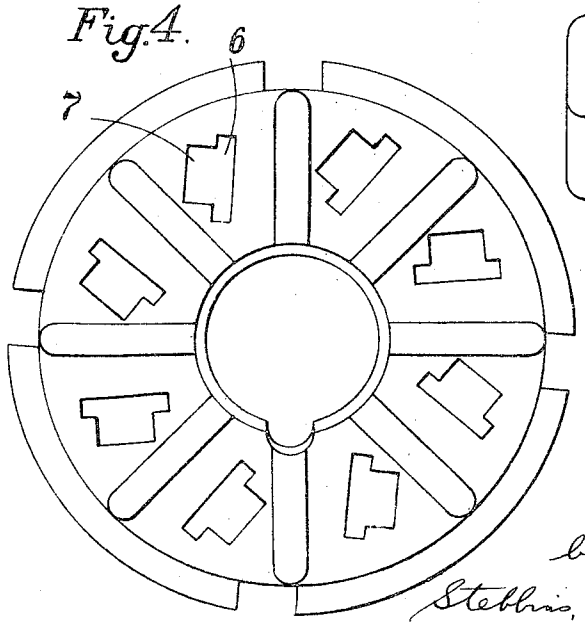

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Fig. 5.

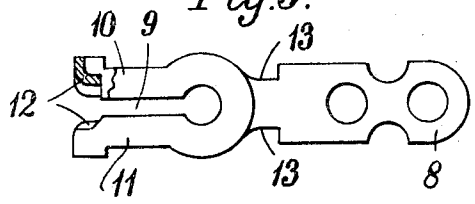


Fig. 6.

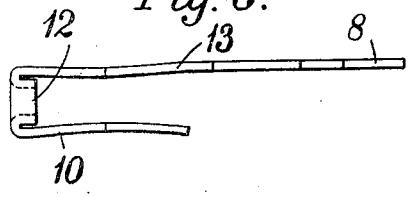


Fig. 7.

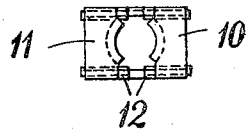


Fig. 8.

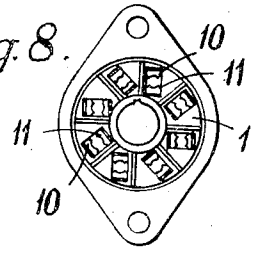
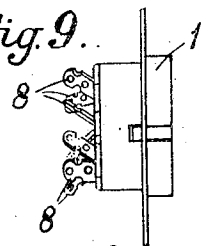


Fig. 9.



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UNITED STATES PATENT OFFICE

2,493,658

THERMIONIC VALVE HOLDER

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5 Claims. (Cl. 173—328)

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This invention relates to thermionic valve-holders of the type comprising an insulating body (referred to hereinafter as the barrel) formed with a number of openings (usually arranged as an annular series) extending parallel with the axis of the barrel and arranged to accommodate a corresponding number of one-piece metal contact elements, each of which is formed at one end as a socket or the like to receive a contact pin of the valve and at the other end with a tag or equivalent terminal to take a circuit wiring connection. For the purpose of securing a valve-holder in position, e. g. to the chassis of a wireless set, it is customary to provide the barrel, at a position intermediate in its depth, with an attached flange-forming plate or saddle, usually of metal, in which apertures are formed to receive fixing screws or bolts.

In thermionic valve-holders of the type described, it has already been proposed to form each contact element as a strip having a narrow lower portion forming the tag or equivalent terminal and broader upper portion divided to form a pair of resilient legs fitting somewhat snugly into slot-like lateral extensions of an axial barrel opening, the arrangement being such that on the insertion of a valve contact pin the legs will flex, not by spreading in the general plane of the contact element, but by a twisting movement in opposite directions out of that plane.

The present invention provides a thermionic valve-holder of the type described which is characterised in that each contact element comprises a metal strip having a lower portion forming the tag or equivalent terminal and an upper portion which, intermediate in its length, is doubled back (i. e. like a picture hook) so that a part thereof lies approximately in a plane parallel with but slightly spaced apart from the general plane containing the remainder of the contact element, the upper portion of the contact member being divided so that it forms two U-shaped members adapted to receive the contact pin of the valve between them. The bridge pieces of the U-shaped members may be shaped so that there is formed between them a substantially circular hole to receive the contact pin of the plug. The above arrangement provides, in relation to the prior proposal already referred to, an increased area of contact between the valve pin and the contact element. On insertion of a valve pin the resilient legs of the contact element yield by a simple spreading action without twisting movement.

According to a further feature of the invention each contact element is accommodated in and secured to the insulating barrel in the following way. The axial opening in the barrel to receive the contact element is for the greater part of its length of uniform rectangular cross-section, large enough to accommodate the doubled back portion of the contact element. At the lower end of the axial opening the cross-section is reduced, forming a shoulder to act as an abutment for the shoulder which is formed by notching the contact element. The aperture remaining at the lower end of the axial opening is in two side-by-side communicating parts, one of which is wide enough to pass the tag portion of the contact element, while the other part is of reduced width. The contact element immediately below the doubled back portion thereof is notched at each side to reduce the width of the strip in that area to slightly less than that of the reduced width part of the aperture at the lower end of the axial opening. Each contact element is inserted, tag portion leading, into the barrel opening from the upper end of the barrel, the tag portion of the element being threaded through the wider part of the aperture at the lower end of the axial barrel opening. When the element has been pushed home to the full extent, the notched portion of the element is in register with the reduced width portion of the aperture at the lower end of the axial opening and the notched portion of the element is thus permitted to enter the reduced width part of the aperture. It will in fact be sprung into this position by the pressure of the doubled back portion against the walls of the opening in the barrel. When in this position the notched sides of the contact member engage above and below the barrel shoulder and prevent withdrawal of the contact element. After assembly of the contact elements the tag ends may be bent over in order to facilitate the operation of attaching lead wires to them and to spread them out. It will be understood, however, that the contact elements are firmly secured in the barrel by the notch and shoulder engagement already referred to.

In order that the invention may be well understood, one form of construction of a thermionic valve-holder according to the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a plan of the insulating body or barrel of the holder;

Figure 2 is a side elevation thereof partly in section;

Figure 3 is a fragmentary section taken on line 3—3 of Figure 1;

Figure 4 is a bottom plan view;

Figure 5 is an elevation of one of the contact elements of the valve-holder, a bridge-piece of one of the two U-shaped members constituting the upper portion of the contact element being shown in section;

Figure 6 is an elevation of the contact element taken at right-angles to Figure 5;

Figure 7 is an end view of the contact element; and

Figures 8 and 9 are plan and side views respectively of the completely assembled valve-holder, these views being drawn to a reduced scale.

As shown in Figures 1 to 4, the insulating body or barrel 1 of the valve-holder is of generally cylindrical shape and is proved with an annular series of openings 2 of generally rectangular cross-section extending axially through the barrel from the front face or top face 3 thereof to a point near the bottom or rear face 4 thereof, where the opening is reduced in section forming a shoulder 5. The reduced aperture thus formed at the lower end of the opening 2 is in two side-by-side communicating parts 6 and 7 (Figures 1 and 4) of which the part 6 is wide enough to pass the tag portion of the contact element whilst the other part is of reduced width to form the shoulder 5.

Each of the openings 2 is adapted to receive a tag element constructed as shown in Figures 5, 6 and 7 of the drawings and comprising a metal strip having a lower portion 8 forming a tag or equivalent terminal and an upper portion which is formed with a slot 9 and is bent double at a point intermediate the ends of the slot so as to form two U-shaped members 10 and 11 separated by the slot 9. Where the slot 9 extends between the bridge pieces of the members 10 and 11, portions of the material are pressed down as shown at 12 so as to widen the slot and to form a substantially circular hole to receive the contact pin of the valve. The two arms of each of the U-shaped members 10 and 11 are bowed towards one another so as to provide smooth contact surfaces adapted to grip the valve pin between them and thus to provide a socket of extended area for making good contact with the valve pin. On insertion of valve pin, the U-shaped members 10 and 11 spring spring apart to receive the pin and thus yield by a simple spreading action without twisting movement.

The contact element is provided immediately below the U-shaped legs 10 and 11 with two notches 13, one at each side of the strip, these notches being shaped to receive the shoulder 5. Each contact element is inserted, tag end leading, into the barrel opening 2 from the upper end of the barrel, the tag 8 being threaded through the aperture 6. Owing to the resilience of the legs 10 and 11 of the contact member, the part of the contact member in which the notches 13 are formed tends to spring laterally towards the reduced aperture 7 at the bottom of the opening 2. When the contact element has been pushed home to the full extent, the notches 13 are brought into register with the shoulder 5 and the springing action above referred to moves the notches into engagement with the shoulder. The contact element is thus securely keyed in position in the holder, one side of each notch 13 engaging above the shoulder 5 whilst the other side bears against the bottom face 4 of the barrel below the shoulder 5. After assembly of the contact element, the tag ends 8 may be bent over, for example as shown in Figure 11, to facilitate the operation of attaching lead wires to them and to spread them out. It will be understood, however, that the contact elements are firmly secured in the barrel by the notch and shoulder engagement already referred to.

A metal saddle 17, attached to the barrel by means of four stuck-up tongues 16 engaging with grooves 15 in the barrel wall, provides a flange for fixing the barrel to a support such as the chassis of a wireless set.

I claim:

1. An electrical socket contact element comprising a metal strip having an elongated slot extending lengthwise of the strip intermediate in its length and terminating in enlarged rounded ends, which strip is doubled over at a position intermediate in the length of the slot to provide two substantially parallel spaced legs connected by a bridge-piece, the slot extending across the bridge-piece and for a substantial distance along each leg to divide the bridge-piece and the adjacent portions of the legs into two parallel U-shaped parts connected at the enlarged ends of the slot, and which strip has a pin-receiving aperture in the bridge-piece formed by the slot the edges of which appropriated to the two parts of the bridge-piece provide pin-engaging contacts supported respectively by the two parts of the two legs for resilient movement in the lateral direction of the strip by resilient separation of the parts of the legs by bending of the material around the enlarged ends of the slots.

2. An electrical socket contact element comprising a metal strip having an elongated slot extending lengthwise of the strip intermediate in its length and terminating in enlarged rounded ends, which strip is doubled over at a position intermediate in the length of the slot to provide two substantially parallel spaced legs connected by a bridge-piece, one of which legs is extended beyond the enlarged end of the slot to form a tag-like terminal element, the slot extending across the bridge-piece and for a substantial distance along each leg to divide the bridge-piece and the adjacent portions of the legs into two parallel U-shaped parts connected at the enlarged ends of the slot, and which strip has a pin-receiving aperture in the bridge-piece formed by the slot the edges of which appropriated to the two parts of the bridge-piece provide pin-engaging contacts supported respectively by the two parts of the two legs for resilient movement in the lateral direction of the strip by resilient separation of the parts of the legs by bending of the material around the enlarged ends of the slots.

3. A thermionic valve holder comprising an insulating body formed with a number of parallel longitudinally extending throughway openings, each reduced at one end to form a shoulder, and a number of electrical socket contact elements accommodated in the openings, each of which electrical socket contact elements comprises a metal strip having an elongated slot extending lengthwise of the strip intermediate in its length and terminating in enlarged rounded ends, which strip is doubled over at a position intermediate in the length of the slot to provide two substantially parallel spaced legs connected by a bridge-piece, one of which legs is extended beyond the enlarged end of the slot to form a tag-like terminal element provided with notches to

receive the shoulder in the throughway opening, the slot extending across the bridge-piece and for a substantial distance along each leg to divide the bridge-piece and the adjacent portions of the legs into two parallel U-shaped parts connected at the enlarged ends of the slot, and which strip has a pin-receiving aperture in the bridge-piece formed by the slot the edges of which appropriated to the two parts of the bridge-piece provide pin-engaging contacts supported respectively by the two parts of the two legs for resilient movement in the lateral direction of the strip by resilient separation of the parts of the legs by bending of the material around the enlarged ends of the slots, in which holder the notches are sprung into engagement with the shoulder thereby securing the contact elements to the body with the tag-like terminal elements projecting from the body.

4. An electrical socket contact element according to claim 1 in which portions of the bridge-piece at opposed positions along the edges of the slot therein are upset to provide an enlargement of the slot of concave arcuate form on each side thereof and to provide at said enlargements the aforesaid pin-engaging contacts.

5. An electrical socket contact element according to claim 1 in which the legs are bowed towards one another so as to define between the edges of the sections of the slot extending along the said legs a pin-receiving enclosure.

STANLEY THOMAS DEAKIN.

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