

April 11, 1961

A. B. CLEWES

2,979,688

TUBE SOCKET FOR PRINTED CIRCUIT PANEL

Filed Feb. 9, 1959

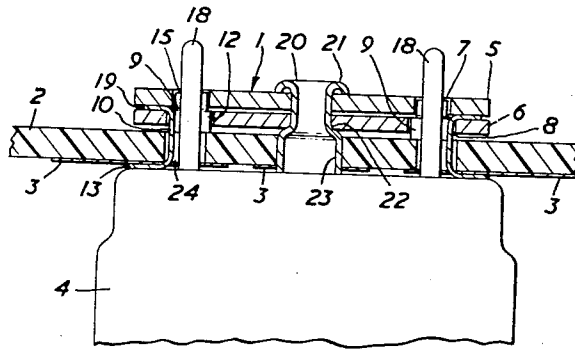


FIG. 1.

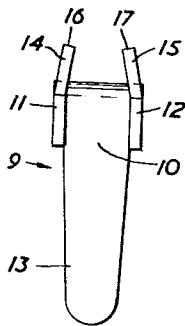


FIG. 2.

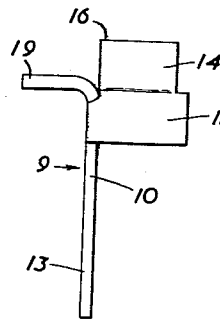


FIG. 3.

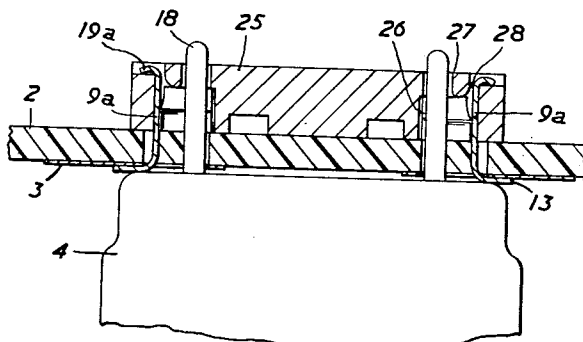


FIG. 4.

INVENTOR
ANTONY B. CLEWES
BY

John Todd

ATTORNEY

1

2,979,688

TUBE SOCKET FOR PRINTED CIRCUIT PANEL

Antony Brasher Clewes, Wollaton Park, England, assignor to United-Carr Fastener Corporation, Wilmington, Del., a corporation of Delaware

Filed Feb. 9, 1959, Ser. No. 792,053

1 Claim. (Cl. 339—194)

This invention relates to holders for thermionic valves, plugs, or other electrical devices having projecting terminal prongs.

It is an object of the invention to provide an improved form of holder and an improved form of prong receiving contract for mounting in the holder.

According to the present invention the holder comprises a base of insulating material in which is mounted a series of prong receiving contacts each of which includes a prong receiving socket portion shaped and positioned to receive and engage a prong inserted from one face of the base, and a terminal tag integral with the said socket portion and projecting from the said one side of the base.

The holder may be used with panels having circuit diagrams printed, etched or otherwise marked on one face, the holder being assembled on the unprinted face of the panel by entering terminal tags of the prong receiving contacts through apertures in the panel so that the free ends of the tags extend beyond the opposite face of the panel. The projecting ends of the tags are subsequently bent outwardly so as to extend into overlapping relationship with parts of the printed circuit to which they may be secured by a dip soldering operation.

The valve or the like for use with the holder is assembled from the printed face of the panel by entering the valve prongs through the panel apertures and into engagement with the prong receiving contacts in the holder. As the holder is mounted on the opposite or unprinted face of the panel, the extent the valve projects from the opposite face of the panel is reduced by the height of the holder.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawing, in which:

Fig. 1 is a sectional view of a valve holder secured to a printed circuit panel and with a valve inserted therein,

Fig. 2 is a front view of one of the prong-receiving contacts of the valve holder,

Fig. 3 is a side view of the contact of Fig. 2, and

Fig. 4 is a sectional view of a second type of valve holder secured to a printed circuit panel and with a valve inserted therein.

With reference to Figs. 1 to 3 of the accompanying drawing, a valve holder 1 of the laminated type is secured to a panel 2 which has printed circuit portions 3 thereon, and has a valve 4 inserted therein.

The holder 1 comprises a pair of superposed plates 5, 6 of insulating material, each having a series of contact receiving apertures 7, 8.

A prong receiving contact 9 is assembled in each pair of apertures, and as shown each contact 9 is made of sheet metal and includes an elongated flat strip 10 provided with integral portions at one end which are bent to extend normal to the plane of the strip from opposite side edges thereof so that they form two opposite parallel wings 11, 12 which form a prong engaging socket. The

2

opposite end of the elongated strip is preferably tapered and constitutes the terminal tag 13 of the contact.

Each of the lateral wings 11, 12 is provided at the edge which is remote from the end of the terminal tag 13, with a blade portion 14, 15, these blade portions being bent inwardly towards one another to define the prong receiving opening. The ends of the blade portions provide sharp edges 16, 17 for making frictional engagement with an inserted prong 18 of the valve 4 so as to have a scraping action to ensure efficient mechanical and electrical engagement. It will be noted that prong engaging edges 16, 17 are disposed at the end of the socket which is remote from the free end of the terminal tag 13, the prong 18 being inserted by movement in a direction along the terminal tag towards the adjacent face of the holder so that the prong receiving end of the socket faces the free end of the terminal tag.

A lug 19 is formed from the elongated strip 10 adjacent to the socket portion but projects in an opposite direction thereto and extends at right angles to the plane of the strip 10. The contacts 9 are assembled with the plates 5, 6 by inserting the socket portion in one of the apertures 8 in the valve prong receiving face of the plate 6 so that the terminal tag 13 extends at right angles from the said face and the lug 19 is positioned to extend into overlapping relation over a portion of the opposite face of the plate 6. The plate 5 is then positioned over the plate 6 and the apertures in the two plates aligned and the prong engaging edges 16, 17 of the blades 14, 15 of the socket portion are disposed within the aperture 7 of the plate 5. The plates 5, 6 are secured in assembly by a hollow rivet 20 inserted through aligned central holes in the plates, and secured by a flange 21 at one end of the rivet and an intermediately disposed shoulder 22 abutting the respective outer faces of the plates. The rivet 20 also has a tubular extension or skirt 23 projecting from the prong receiving face of the holder 1.

As shown in Fig. 1, the holder is assembled with the panel 2 having a circuit diagram 3 printed on one face. The terminal tags 13 project through apertures 24 in the panel 2 and extend beyond the face thereof provided with the printed diagram 3. The tags 13 are then bent outwardly to extend over the edges of the apertures 24 to overlap parts of the circuit diagram 3 to which they may subsequently be secured by a dip soldering operation.

The projecting end of the skirt 23 is inserted through a hole in the panel 2 located centrally of the apertures 24, and is secured to an earth part of the printed circuit 3 by the dip soldering operation. A valve 4 is assembled with the holder 1 from the face of the panel 2 having the printed circuit 3, the prongs 18 being inserted through the apertures 24 in the panel and into the socket portions of the contacts 9 where they are engaged by the sharp edge portions 16, 17 of the lateral wings 11, 12.

Preferably the prong receiving apertures 7 in the plate 5 are of smaller diameter than the apertures 8 in the plate 6, so that the edges of the apertures 7 will project inwardly of the edges of the apertures 8. The inwardly projecting edges will accordingly overlie the inner end of the lugs 19 which are clamped between the plates 5, 6 and serve as stops to prevent axial displacement of the prong engaging contacts 9.

The plates 5, 6 of the holder 1 may be made of fibre-glass or other suitable insulating material.

According to a second embodiment as shown in Fig. 4, the base or body 25 of the holder is moulded as a single piece from synthetic resinous material, and has a series of contact receiving apertures 26 which extend partly through the body 25 from the prong receiving face. From the inner end of each aperture 26, a prong receiving aperture 27 and a lug receiving aperture 28 extend

3

to the opposite face of the body 25, and as shown the prong receiving aperture 27 lies radially inwardly of the lug receiving aperture 28.

The contacts 9a used in the holder are similar to the contacts 9 used in the holder 1, but the lugs 19a are longer than the corresponding lugs 19. The contacts 9a are assembled with the body 25 by inserting the socket portion in one of the apertures 26 so that the terminal tag 13 extends at right angles from the prong receiving face of the body 25 and the lug 19a extends through the lug receiving aperture 28 and projects beyond the opposite face of the body. The projecting portion of the lug 19a is then bent outwardly to lie against the adjacent face of the body 25 so as to retain the contact 9a in the body 25 of the holder. The depth of the apertures 26 is arranged to be substantially equal to the depth of the socket portion of the contact 9 so that the longer edges of the socket portion are aligned with the prong receiving face of the body 25.

If desired, the body 25 may be provided with a central hole and central contact with a tubular extension similar to the tubular extension 23 described in the previous embodiment. As shown in Fig. 4, the holder is assembled with a panel 2 having a printed circuit 3 on one face in the same way as has been described for the previous embodiment shown in Fig. 1. As before, the prongs 18 of a valve 4 are inserted through apertures 24 in the panel 2 into engagement with the socket portions of the contacts 9a, the ends of the prongs 18 being located in the prong receiving apertures 27.

I claim:

A tube holder comprising upper and lower insulating plates, said lower plate having an annular series of aper-

4

tures, said upper plate having an annular series of apertures in registry with said apertures of said upper plate, each of said apertures of said lower plate being of larger diameter than its registering aperture of said upper plate whereby the walls surrounding said apertures of said upper plate project inwardly of said walls of said apertures of said lower plate, and a prong-receiving contact disposed in each pair of registering apertures of said plates, each of said contacts having a flat strip portion, a terminal portion at one end of said strip portion, wing portions at an opposite end of said strip portion from said terminal extending in parallel normal relation thereto, blade portions of shorter length than said wing portions extending from an edge of said wing portions remote from said terminal portion, said blade portions being disposed within said apertures of said upper plate and bent inwardly toward each other to define a prong-engaging portion, said wing portions being disposed within said apertures of said lower plate and abutting said upper plate adjacent said apertures thereof, and each contact having a lug element extending from said strip portion in an opposite direction to said wing portions, said lug elements being disposed between said plates and cooperating with said wing portions to maintain said contacts in firm assembly with said plates.

References Cited in the file of this patent

UNITED STATES PATENTS

30	2,730,690	Harasek	Jan. 10, 1956
	2,796,593	Offerman	June 18, 1957
	2,840,793	Sunko et al.	June 24, 1958
	2,863,131	Carlzen et al.	Dec. 2, 1958