Aug. 13, 1957 B. J. JOHANSON 2,803,000

SNAP-IN SUBMINIATURE SOCKET

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Fig. 1

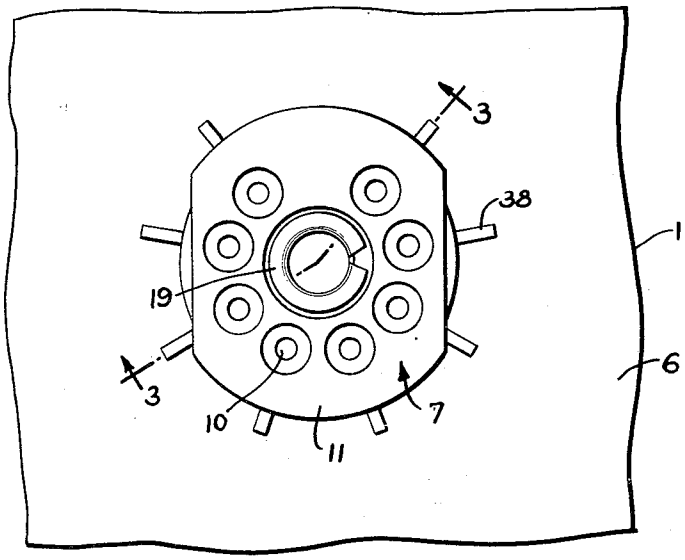

Fig. 2

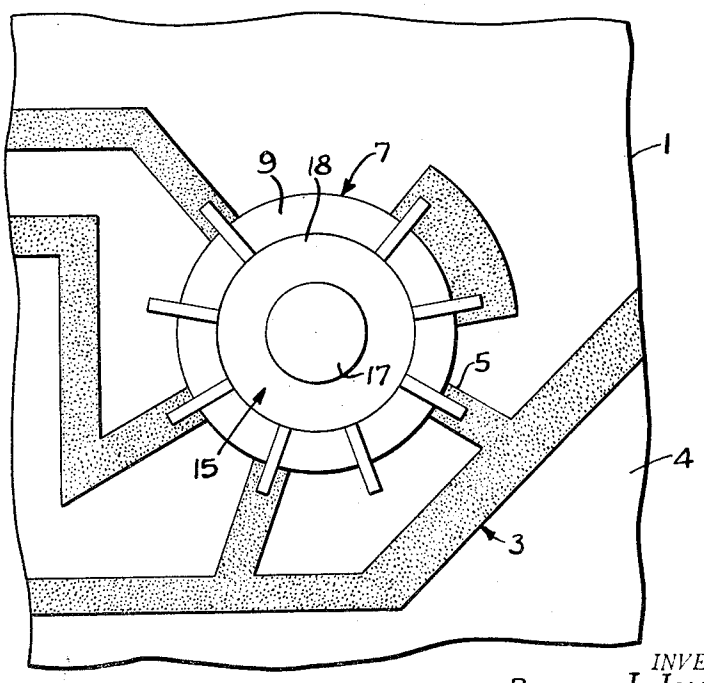

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Fig. 3

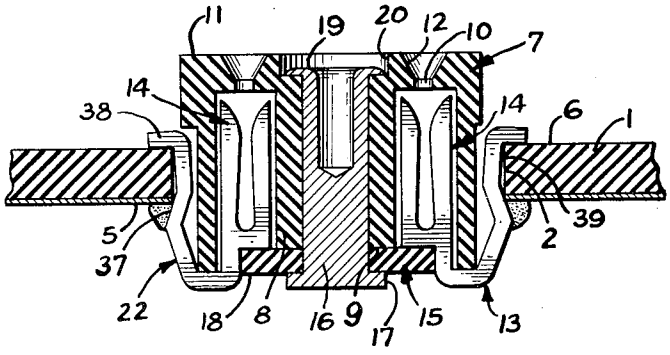


Fig. 4

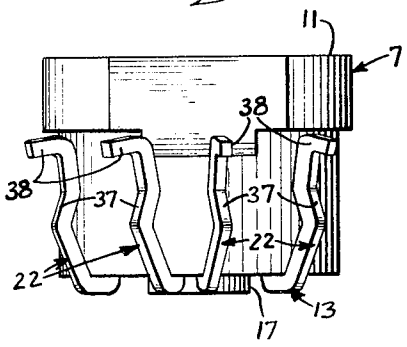


Fig. 5

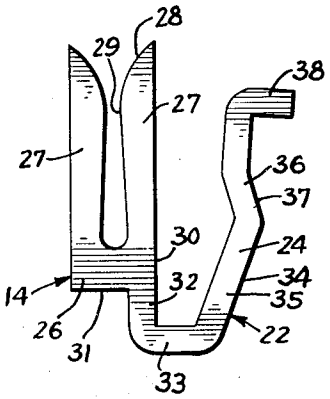
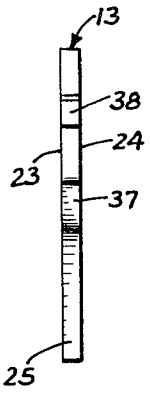


Fig. 6



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United States Patent Office 2,803,000 Patented Aug. 13, 1957

2,803,000

SNAP-IN SUBMINIATURE SOCKET

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Application December 11, 1953, Serial No. 397,665

2 Claims. (Cl. 339—258)

This invention relates to an improved socket device for electronic tubes and particularly to the contact member assembled with the same for receiving and engaging electrically a prong terminal carried by the tube.

An object of my invention is the provision of a contact member of simple design which may be manufactured by a very inexpensive method and which is capable of efficiently connecting the prong terminals of a vacuum tube into the printed circuits carried by the panel which supports the socket device.

Other objects and uses of my invention will be apparent from inspection of the drawings and specification hereinbelow set forth.

Referring to the drawings in which I have illustrated a preferred embodiment of my invention;

Fig. 1 is a top plan view of my socket device secured in initial assembly to a printed circuit panel,

Fig. 2 is a bottom view of the installation shown in Fig. 1,

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1,

Fig. 4 is a side elevation of my improved socket device,

Fig. 5 is a side elevation of my improved contact member per se, and

Fig. 6 is an end elevation of the contact member per se as viewed from the right of Fig. 5.

Referring to the drawings, Figs. 1 to 3 illustrate a socket installation comprising a supporting panel 1 having a socket receiving opening 2. The panel 1 which is formed of insulating material, provides a printed circuit 3 on its lower surface 4 having terminal end portions 5 disposed adjacent the aperture 2. The printed circuit may be applied to the supporting panel by an appropriate method. While the upper surface 6 of the panel 1 does not provide a printed circuit in the installation as illustrated, it will be understood that grounding circuits or the like may be applied to the upper surface for electrical engagement with portions of the contact members of the socket disposed adjacent the upper surface.

The socket device which is assembled with the supporting panel 1 comprises a casting 7 which may be formed of any suitable insulating material. The casting 7 has a series of contact-receiving openings 8 (Fig. 3) which extend into the casting from its lower surface 9. A series of prong-receiving openings 10 extend from the upper surface 11 of the casting and intersect the openings 8 at the upper ends of the same. The wall portions 12 adjacent each of the openings 10 are formed as a tapering lead to facilitate entrance of the prong terminals (not shown) of a cooperating vacuum tube into the openings 8. The casting 7 carries a plurality of contact members 13 each of which has a prong-engaging portion 14 which is moved into its respective opening 8 through the lower surface of the casting. The contact members 13 are maintained in assembly with the casting 7 by means of a washer 15 of insulating material which is applied to the casting after the prong-engaging portions 14 of the contact members

have been positioned in the openings 8. The washer 15 in assembled position is disposed adjacent the lower surface 9 of the casting and provides portions adjacent its periphery obstructing portions of the ends of the openings 8 adjacent the lower face 9 of the casting so as to prevent removal of the contact members in the direction of their insertion. The washer 15 is maintained in fixed assembly with the socket casting by means of a rivet 16 which has a flange element 17 adjacent the lower surface 18 of the washer 15 and a headed-over portion 19 which is preferably disposed in a counter-sunk recess 20 adjacent the upper face 11 of the casting.

The contact member 13 is stamped from a single piece of flat sheet metal and includes the prong-engaging portion 14 and an integral resilient terminal element 22. The broad surface 23 of the prong-engaging portion 14 and the broad surface 24 of the terminal element 22 are disposed in the same planes on both sides of the contact member and the contact member provides narrow edges 25 at the margins of both the prong-engaging portion 14 and the terminal element 22. The prong-engaging portion 14 comprises a base element 26 at its lower end and a pair of fingerlike yieldable elements 27 extending upwardly from the base element 26 in opposed spaced relation for engaging a prong terminal between them. The fingerlike portions 27 have tapering portions 28 at their free ends for leading a prong terminal into electrical engagement between opposed inner narrow edges 29 of the elements 27. The terminal element 22 is integrally joined to the base element 26 adjacent a side 30 of the prong-engaging portion thereby providing a shoulder 31 at the lower end of the base 26 which rests on the washer 15 in final assembly of the socket unit. The terminal element 22 has a leg portion 32 extending downwardly from the prong-engaging portion 14 and projecting in final assembly of the socket unit between the washer 15 and the wall of the respective openings 8. A laterally extending portion 33 extends laterally from the lowermost end of the leg portion 32 and a spring arm portion 34 extends upwardly in spaced, generally parallel relation to the prong-engaging portion 14. The arm portion 34 has an element 35 diverging outwardly from the prong-engaging portion 21 and a converging element 36 extending inwardly in the general direction of the prong-engaging portion 21 so as to form a shoulder element 37 at the narrow outer edge of the arm 34. The outermost free end of the arm 34 preferably has a lip portion 38 for engaging the upper surface 6 of the supporting panel 1 when the socket unit is assembled with the panel. It will be noted that as a result of the novel construction of the contact member wherein the broad flat surfaces of the contact member are disposed in the same plane on each side of the fastener, it is possible to form the finished contact member in a single stamping operation. Thus, the construction of the present contact member is distinguishable from those known in the art in which after the initial stamping, it is necessary to form the terminal element into its reverse bend position with respect to the prong-engaging position. Also, whereas known contact members present broad surfaces for electrical engagement with a prong terminal and a broad face for the panel-engaging shoulder, the present contact member provides narrow edges for accomplishing the function of the broad surfaces of the known devices.

In assembling the socket device with the panel 1, the lower end of the socket unit is moved into the opening 2 to engage the diverging elements 35 of the terminal elements 24 with the wall 39 adjacent the opening 2. As movement of the socket unit through the opening 2 is continued, the arms 34 will contract until their points most laterally remote from the socket casting have passed through the opening 2 at which time they expand to

engage the shoulders 37 behind the lower surface of the panel. The socket unit is now firmly assembled with the panel 1 with the shoulders 37 of the terminal elements adjacent the respective circuits 5. The connections are now ready for soldering and this is preferably accomplished by dipping the panel installation into a solder bath whereby the arms 34 of the terminal elements are soldered to the respective circuits 5 adjacent the sholders 37 of the terminal elements.

Although I have illustrated and described a preferred embodiment of my invention, I do not wish to be limited thereby as the scope of my invention is best defined by the following claims.

I claim:

1. A contact member for a socket unit formed of one piece of sheet metal having a flat surface on each side so that opposed surfaces are disposed in parallel planes and narrow edges intermediate said flat surfaces adjacent the margins of said contact, said contact member having a prong-engaging portion including a base portion and a pair of spaced, yieldable, substantially parallel finger elements extending from said base portion, said finger elements defining an opening between them at their free ends remote from said base portion for receiving a prong member, a spring terminal element integral with said base portion and being capable of spring movement toward and away from said finger elements, said terminal element including a bottom portion secured to a part of said base portion and extending downwardly therefrom in a plane generally parallel thereto, a lateral portion secured to said bottom portion and extending outwardly therefrom at generally right angles thereto, a lower portion secured at one end to said lateral portion and extending upwardly therefrom and slightly outwardly in inclined relationship thereto, and an upper portion connected at one end to the free end of said lower portion and extending upwardly therefrom in a plane generally parallel to the plane of said finger elements, and terminating at a point just below the free ends of said finger elements, said upper portion having a shoulder portion on its narrow edge for fastener engagement behind a supporting panel.

2. A contact member in accordance with claim 1, in which the upper free end of said spring terminal element is provided with a lip portion secured to the top free end of said upper portion, and extending outwardly therefrom at substantially right angles thereto for engaging the surface of the panel opposite from that engaged by the shoulder portion of said upper portion.

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