May 21, 1957 S. M. DEL CAMP 2,793,353

LOW LOSS MINIATURE MOLDED TUBE SOCKET

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FIG. 1.

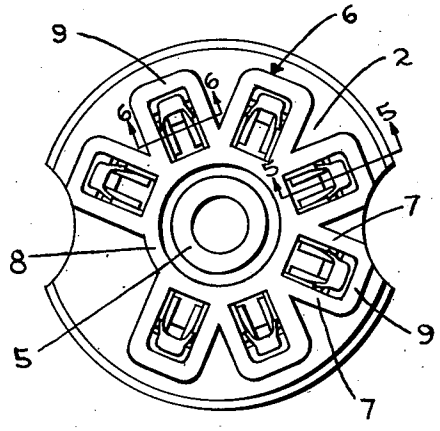

FIG. 2.

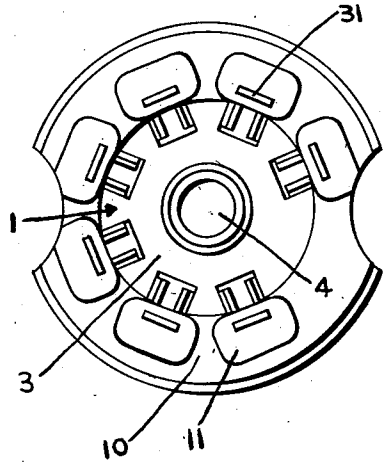

FIG. 3.

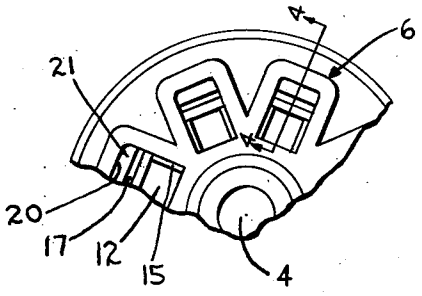

FIG. 4.

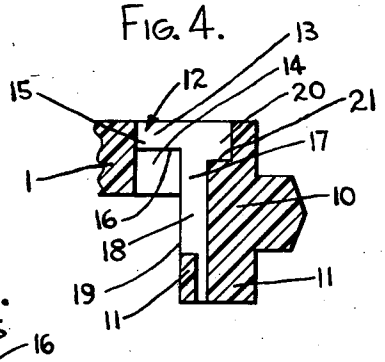

FIG. 5.

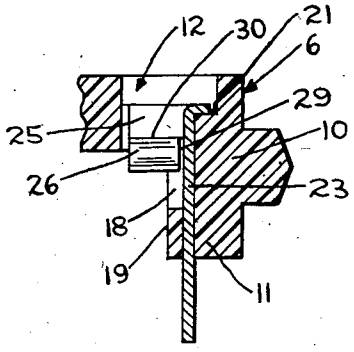

FIG. 6.

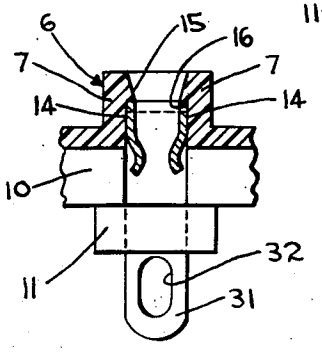

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FIG. 7.

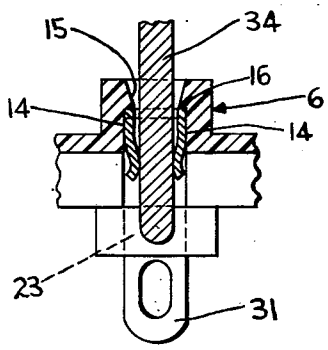


FIG. 8.

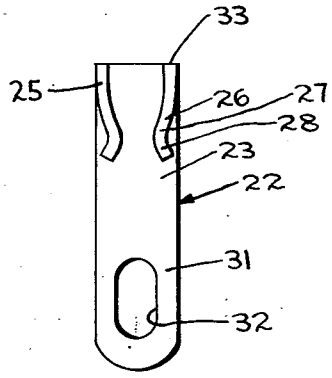
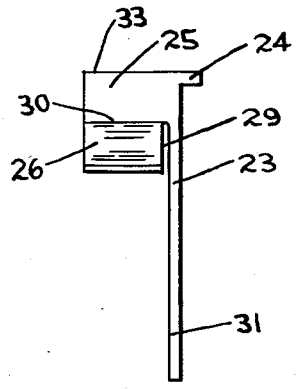


FIG. 9.



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2,793,353

LOW LOSS MINIATURE MOLDED TUBE SOCKET

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Application August 25, 1952, Serial No. 306,178

2 Claims. (Cl. 339—193)

This invention relates to improvements in tube sockets of the type carrying contacts for electrical engagement with the prongs of an electronic tube.

One object of my invention is the provision of a socket constructed in a way to provide decreased capacitance over sockets presently used in the trade thereby effecting a socket designed for efficient use in high frequency currents.

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

Referring to the drawings in which I have set out a preferred embodiment of my invention,

Fig. 1 is a top plan view of my improved socket unit;

Fig. 2 is a bottom plan view of the socket shown in Fig. 1;

Fig. 3 is a fragmentary top view of the socket casting, the contacts and center shield being omitted;

Fig. 4 is an enlarged section taken along the line 4—4 of Fig. 3;

Fig. 5 is an enlarged section taken along the line 5—5 of Fig. 1;

Fig. 6 is an enlarged section taken along the line 6—6 of Fig. 1;

Fig. 7 is a section like Fig. 6 showing a tube prong in engagement with the socket contact;

Fig. 8 is a front elevation of a socket contact per se, and

Fig. 9 is a side elevation of the contact shown in Fig. 8.

Referring to the drawings, the casting of the socket unit may be molded of suitable low loss phenolic material, and comprises a body portion 1 having an upper side 2 and a lower side 3. The body 1 has a central aperture 4 for receiving a tubular magnetic shield 5.

The body portion 1 provides a series of enclosure portions 6 adjacent its upper side each of which has a pair of spaced, parallel wall portions 7 extending radially from a central ring-shaped portion 8 and connected at their outer ends by a bridge element 9. An annular retainer wall 10 extends from the lower surface 3 of the body 1. The retainer wall 10 preferably has protuberant elements 11 on its lower side which are spaced one from another so as to effect an air gap between them and positioned in complementary relation to the enclosure portions 6.

The body 1 provides a series of prong-receiving openings 12 which intersect its upper surface 2 at points within the confines of the respective enclosure portions 6. Each of the openings 12 is constructed to receive a contact member which is maintained in position within the opening by the material of the casting in a manner to be described. Each of the openings 12 has an inner part 13 which extends through the body 1 as most clearly illustrated in Fig. 4. Opposed walls 14 of the casting adjacent said inner part 13 have laterally projecting, tapered abutments 15 forming shoulders 16. The opening 12 has an intermediate part 17 which extends from the upper surface 2 of the body through a complementary

protuberant element 11. The intermediate part 17 has a portion 18 intersecting the inner side 19 of the retainer wall 10 with the result that the retainer wall 10 has a recess in its inner side extending from a point adjacent the junction of the body portion and the retainer wall and terminating short of the outer end of a protuberant element 11. In addition, the opening 13 has an outer part 20 intersecting the upper surface 2 of the body 1 and extending partly through the body so as to be closed at its inner end by a shelf 21. The horizontal plane of the shelf 21 is disposed in spaced underlaid relation to the horizontal plane of the shoulders 16 as most clearly shown in Fig. 4.

The socket unit is provided with a plurality of contact members 22, one for each opening 12. One preferred form of contact member is illustrated in Figs. 7, 8 and 9 and is preferably fabricated from spring, strip metal. The contact comprises an elongated, substantially flat base portion 23 having a tab elemnet 24 adjacent its upper end and joined to the portion 23 intermediate the side edges thereof. The tab 24 extends laterally upon one side of the base portion in substantially perpendicular relation to the broad surface of the portion 23. A pair of wing portions 25 are integrally joined to the base 23 adjacent the upper end thereof and extend from opposed side edges of the base in a direction opposite to the tab 24. The wings 25 are dispoesd with their inner broad surfaces in facing relation and are normally spaced apart a distance greater than that between the abutments 15 of each of the openings 12. As a result of the spring character of the material from which the contact is made, the wings are resiliently movable one relative to the other in the direction of their flat surfaces. Each of the wings 25 has a blade portion 26 integrally joined to its lower edge. Each of the blades 26 in my preferred construction provides an inwardly extending element 27 which terminates in an outwardly flared element 28 as most clearly shown in Fig. 8. The inwardly flared elements 27—27 of the wings 25—25 are normally spaced apart a distance less than the diameter of the tube prong to be engaged therewith with the result that the blade elements are expanded by the tube prong to engage resiliently the same. Each of the blade elements 26 provides an edge 29 which is spaced from the base portion 23 in my preferred form a distance substantially equal to the thickness of the material of the contact. As a result of this construction, the blade elements are hinged at their points of junction 30 with the wings 25 so as to be movable toward and away from each other independently of any yieldable action inherent in the wings 25—25 and, at the same time, the base or terminal element 23 is disposed in close proximity to the blades 26—26 so as to reduce inductance. As a result of the construction of my preferred form of blade elements 26 wherein they provide inwardly extending elements 27 and outwardly flared elements 28, a broad prong-engaging surface is provided on the inner surfaces of the blades 26 for wiping engagement with a tube prong. It will be understood, however, that the outwardly flared elements of the blades 26 may be omitted so as to permit a sharp edge engagement between the wings 26 and a tube prong terminal in the manner suggested by U. S. Patent No. 2,519,121 issued August 16, 1950, to S. M. Del Camp. The lower end 31 of the base portion 23 is in the form of a soldering terminal and preferably provides an opening 32 for receiving a wire or the like to be soldered to the base portion.

In assembling the contact members with the socket unit, the lower end 31 of the base portion 23 is moved into the intermediate part of the opening 17 from the upper side of the body 1. As movement of the base portion 23

through the intermediate part 17 continues the pair of wings 25 of each contact member will engage the opposed abutments 15 of the opening 12 and will be pressed toward each other against their inherent spring tension until the upper edges 33 of the wings 25—25 have passed the abutments 15 at which time the wings 25—25 will expand to engage the upper edges 33—33 behind the shoulders 16. At the same time the tab element 24 will abut the shelf 21 in the outer part 20 of the opening 12 whereby the engagement of the wings 25—25 behind the shoulders 16 and engagement of the tab 24 with the shelf 21 cooperate to secure the contact member in firm assembly with the body 1 of the socket unit.

It will be noted that when the contact members are in final assembly with the body 1 of the socket unit, the wings 25—25 abut the walls 14—14 adjacent the inner part 13 of the opening 12 so as to be supported thereby in the manner most clearly shown in Fig. 6. As a result flexibility of the blades 26—26 is restricted about fulcra points 30 at the points of junction of the blades 26 with the wings 25. This construction increases the stiffness in the blades 26 and effects a greater tensional grip upon a tube prong 34 as illustrated in Fig. 7. When the contact members are in assembly with the body 1 of the socket unit, the greater part of the blades 26 in my preferred embodiment are disposed outside of the marginal confines of the retainer wall 10, but a portion of the blades 26 adjacent their edges 29 are disposed within the recess 18 of the intermediate part 17. The relatively open construction of the body 1 and the disposition of the contacts effects reduced induction by the fact that the mass of insulating material between adjacent contacts is reduced to the minimum necessary to hold the contacts in assembly with the body. Induction is further reduced by the relatively short connection between the soldering terminal 31 and the blades 26—26 which is accomplished by disposing the material of the blades 26—26 adjacent their edges 29 within the recess 18 so that the material is positioned in the closest possible relation to the base 23.

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 comprising an elongated, substantially flat back portion, the top free end of said back portion being provided with a tab portion extending at substantially right angles thereto for engagement with a supporting structure, a pair of opposed, spaced yieldable wing elements with each extending from a side edge of said back portion adjacent the top end thereof in a direction away from said tab portion, each of said wing elements having their broad surfaces disposed in planes substantially perpendicular to the broad surfaces of said back portion, each of said wing elements having a narrow free edge at its upper end disposed in the plane of said wing elements and the top surface of said tab portion for snap fastener engagement behind the shoulder of a supporting structure, and a blade element integrally joined to each bottom free end of said wing elements and being yieldable independently of said wing elements for resilient engagement with a terminal member inserted therebetween.

2. A molded electronic socket comprising a casting of insulating material having a base portion provided with a center portion having a central aperture therein, a plurality of integral, upstanding, top enclosure portions secured to one face of the body portion and being spaced from and extending radially outwardly from said center portion, each of said enclosure portions having an elongated opening extending axially therethrough with the long axis thereof extending radially outwardly with respect to said center portion, each opening forming elongated, opposed side walls and short, opposed end walls in each of said enclosure portions, a portion of each of said side walls adjacent said center portion being tapered inwardly in the direction of one another from the top free end thereof and terminating at a level above the top surface of the plane of said base portion forming opposed, undercut, transversely extending shoulder portions therein, each end wall of said enclosure portions remote from said center portion being provided with a transversely extending shelf portion spaced intermediate the shoulder portion of said side walls and the top surface of the plane of said base portion, each shelf portion being spaced outwardly from said opposed shoulder portions in said side walls, and a plurality of bottom enclosure portions integrally carried by the opposite face of said base portion in perimetrally spaced relationship adjacent the perimetral edge thereof with each of said bottom enclosure portions being in axial alignment with a complementary top enclosure portion, each of said bottom enclosure portions having an elongated slot extending axially therethrough and in alignment with only a portion of the opening in each of said top enclosure portions remote from said center portion, said elongated slot having a cross section of a length substantially corresponding to the width of the aligned opening in each of the top enclosure portions and extending transversely with respect to the long axis of each of the aligned top enclosure openings, the slot of each of said bottom enclosure portions forming elongated side walls and short end walls, the inner surface of each outside end wall of said bottom enclosure portion remote from said center portion being in axial alignment with and constituting a continuation of the inner surface of each outside end wall of said top enclosure portion, the inside end wall of each bottom enclosure portion being in substantial axial alignment with the free end of the opposed shoulder portions of the side walls of the top enclosure portion, a contact member carried by said base portion, said contact member having a flat, elongated, terminal portion disposed in the opening in said top enclosure portion and extending into the slot of said bottom enclosure portion and being in engagement with the aligned continuous inner surface of the outside end walls of said top enclosure portion and said bottom enclosure portion, the top free end of said terminal portion being provided with an outwardly extending tab portion in engagement with and supported by the transversely extending shelf portion of said top enclosure portion, a pair of opposed, spaced, yieldable prong engaging portions extending forwardly from each side edge adjacent the top end of said terminal portion in the direction of said center portion and in engagement with the opposed side walls of said elongated opening of said top enclosure portion, the top free edges of said prong engaging portions being snapped into engagement by the tapered portions of said opposed side walls in the opposed transversely extending undercut shoulder portions of said opposed side walls, said formed shoulders and said shelf portion cooperating to hold said contact member in assembly with the said casting.

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