

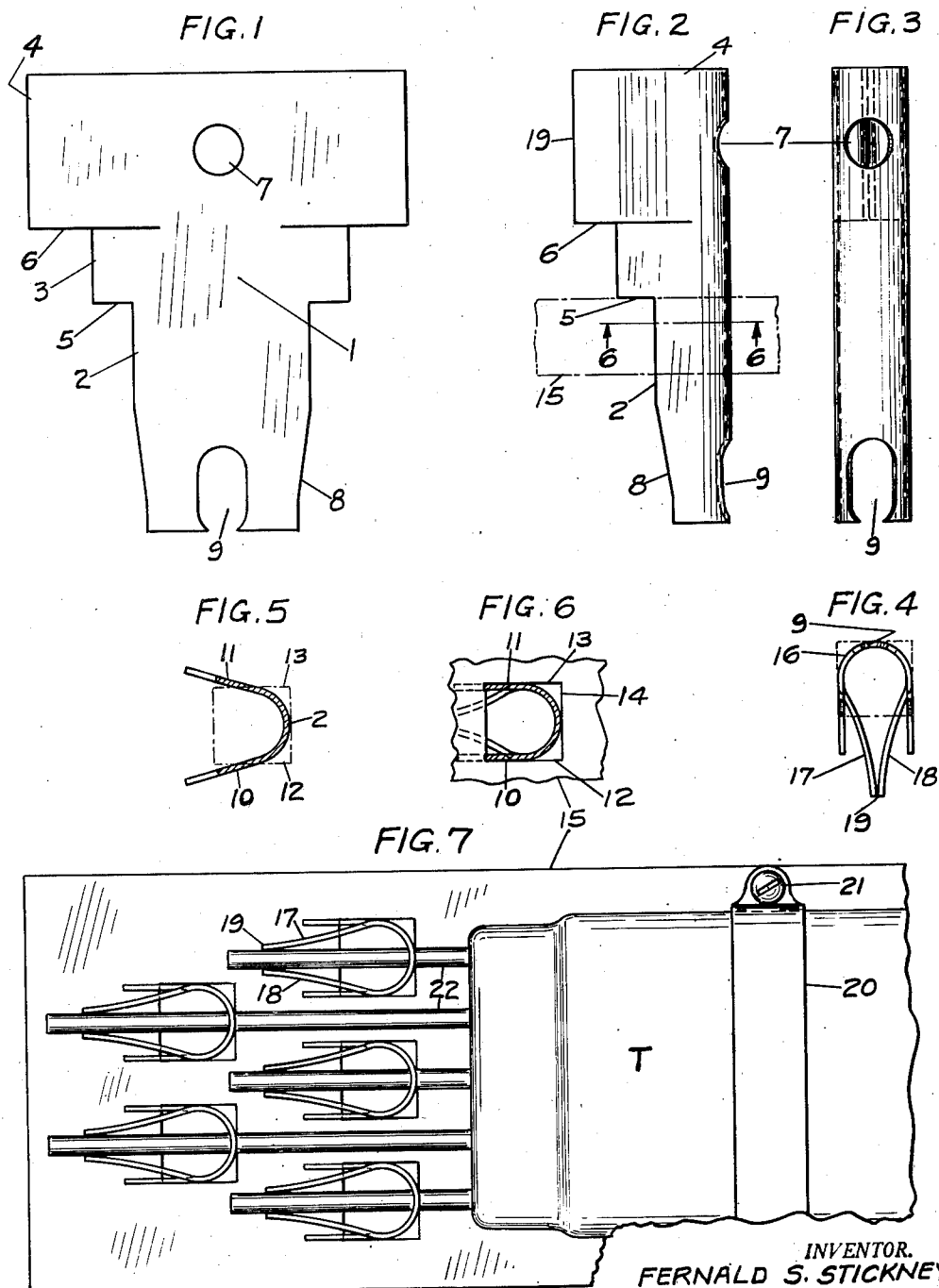
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F. S. STICKNEY

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CONTACT TERMINAL FOR THERMIONIC TUBES

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INVENTOR.
FERNALD S. STICKNEY

BY *A. D. T. Libby*
Attorney

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CONTACT TERMINAL FOR THERMIONIC
TUBES

Fernald S. Stickney, West Caldwell, N. J.

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This invention relates to the construction and mounting for an electric contact terminal for use in making electrical connections to thermionic tubes and especially those of the sub-miniature type which are being developed for special work such as radar and hearing apparatus. These types of tubes are very small and have fine terminal wires of the order of .016 inch in diameter and spaced on .050 inch centers. It is the principal object of my invention to provide a contact terminal for these fine and closely spaced wires such that a connection can be made with these wires in an easy but highly effective manner.

Another object of my invention is to provide a terminal to which the tube wires may be not only easily and effectively connected but one in which the tube may be easily replaced.

Another object of my invention is to provide a design of a terminal which may be readily and securely fastened to a mounting strip or panel.

Other objects will be clear to one skilled in this art from a reading of the following specification taken in connection with the annexed drawing, wherein,

Figure 1 is a plan view of the blank from which the terminal is made.

Figure 2 is a side view of Figure 1 after the blank has been formed into the desired shape.

Figure 3 is a view of Figure 2 looking from right to left.

Figure 4 is an end view of Figure 2 looking from the bottom to the top, the view being turned 90 degrees.

Figure 5 is a view substantially on the line 6—6 of Figure 2 before the terminal is inserted into the mounting panel and showing only section 3.

Figure 6 is a view similar to Figure 5 but after the terminal has been mounted into the support plate or panel.

Figure 7 is a view showing five of the terminals mounted on the panel with the connections from the tube made to the terminals.

In all of the views the scale is on approximately a ten to one ratio, that is to say that the parts are shown ten times larger than their normal size. In the different views 1 is a blank punched or formed from suitable metallic material such as beryllium copper of approximately .005 inch thick which I have found very satisfactory for the purpose. The blank has three sections, 2, 3 and 4, section 4 being of greater width than sections 3 and 2 while section 3 is somewhat wider than section 2. Between sections 2 and

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3 there is a shoulder 5 and between the sections 3 and 4, a shoulder 6. Section 4 has a hole 7 therein for a purpose which will be later described. Also the section 2 has a tapering end 8 for ease of assembly into the panel. This tapered end has an orifice or opening 9 therein for making electrical connection thereto. After the blank has been made as shown in Figure 1 it is formed into the shape shown in Figures 2 and 3. It will be noted from Figure 5 that the sides 10 and 11 of section 2 are formed so as to be somewhat farther apart than the distance between the sides 12 and 13 of the rectangularly shaped hole 14 made in the panel member 15. This is so that when the terminal is assembled into the hole 14 which I prefer to make square, these sides 10 and 11 will be compressed toward each other, and since the material should have considerable elasticity therein, these sides will exert pressure against side walls 12 and 13 of the hole 14. Since the developed width of section 2 is greater than the width required to fill the square hole as shown, the edges of sides 10 and 11 tend to cut into the insulating material of the panel near the corners. Furthermore, the forces exerted in sides 10 and 11 by this cutting action produces additional elastic deformation of the semicircular portion of the section. The total elastic deformation of section 2 of the terminal compensates for minor variations in the size of hole, and width of terminal, and renders the holding force of the terminal in the panel relatively free from variation due to manufacturing tolerances. Furthermore, the length of the sides of section 3 is somewhat longer than the sides 12 and 13 so that their edges will, by reason of the shoulder 5, act as a stop for locating the terminal in the panel member 15, which is preferably made of laminated plastic material.

The section 4 of the terminal as shown in Figures 4 and 7 has a cylindrical portion 16 which extends into oppositely positioned sides 17 and 18 that act as two opposing leaf springs meeting to form a contact gripping edge 19 which has a length corresponding to the line 19 (see Figure 2). The hole 7 is located in section 4 so its axis as shown in the drawing intersects the long contact 19 all as indicated in Figure 7.

In this figure a tube T is held to the panel 15 in any satisfactory manner as by a strap 20 and screws 21, only one of which is shown. Extending from the tube T are five wires 22 of a size heretofore indicated and each of these wires passes through its associated hole 7 and between the sides 17 and 18 of the terminal,

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making a wiping contact at the edge 19. The holes 7 are made considerably larger than the diameter of the wires and act as guides therefor to make it easy in assembling the tube T to the panel 15.

After the assembly has been made according to Figure 7 and the panel mounted in a satisfactory position, then the electrical or circuit conductors may be connected thereto as described. It will be obvious that the arrangement or positioning of the terminals on the panel as shown in Figure 7 may be varied to suit conditions. Likewise the thickness of the material forming the terminal may be varied somewhat depending upon the material used, but in any case the material should have considerable resilience so as to insure a good contact along the line 19. Having thus described my invention, what I claim is:

1. A contact terminal for mounting an electrical device, such as a sub-miniature thermionic tube having conductors extending therefrom, in a rectangularly shaped hole in a panel of insulating material comprising, a member made from suitable sheet metallic material of considerable resilience, said member having a plurality of sections, one at one end having an arcuately formed portion with side extended parts meeting to form a grip for a conductor coming from the tube, said arcuately formed portion having a hole therein to allow the tube conductor to pass into said grip, another section adjacent the first mentioned section arcuately formed with its sides in the same general direction as those of the first mentioned section so its sides will be spaced sufficiently to act as an assembly stop on the face of the panel and a further end section joined to the second mentioned section and formed U-shaped in cross section so its sides and edges will be forced into the walls of said rectangularly shaped hole in the panel to hold the terminal therein and also to receive a circuit conductor.

2. A contact terminal for a thermionic tube having conductors extending therefrom, for mounting in a rectangularly shaped hole in an insulating strip or panel of suitable material comprising, a member of suitable metallic material, said member being rolled from a blank having sections of different widths, the widest section at one end after forming having an arcuately formed portion with the sides extending therefrom to meet in a gripping edge, said arcuately formed portion midway between the sides having a hole therein the axis of which is substantially in alignment with said gripping edge, the next widest section adjacent the said widest section being formed generally U-shaped with its sides spaced farther apart than the width of the hole in said strip so as to engage the face of the panel adjacent the hole and thus act as a stop, the narrowest and opposite end section having the edges of its sides normally somewhat farther apart before installation than the width of said hole in the insulating strip whereby when these sides are forced into the hole they will expansively engage opposite walls of the hole while the edges of its sides cut into another wall to hold the terminal securely within the hole, the end of this narrowest section being formed to receive a circuit conductor.

3. A contact terminal for a thermionic tube comprising, a member of suitable metallic material, said member being made up of a plurality of tandemly arranged stepped sections of different width, the end section of the narrowest width

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having resilient spaced sides arcuately formed on the central longitudinal axis of the member so as to grip the walls of a hole in a panel member of suitable insulating material and having an orifice therein at its free end to receive a circuit conductor, the section at the opposite end being the widest and having oppositely spaced parts meeting to form an elongated contact with these parts joined into an arcuately formed portion on said axis, this portion having a clearance hole therein in alignment with said elongated contact while an intermediate section is also arcuately formed about said axis with flared sides at least the outer edges of which are spaced a distance greater than the width of the hole in the panel so as to engage the face of the panel and act as stop means for the terminal.

4. A contact terminal for mounting a sub-miniature thermionic tube in a hole preferably polygonal in shape on a panel of suitable insulating material comprising, a member of suitable metallic material, said member having at least two sections arranged symmetrically about a common longitudinal axis, the section at one end of the terminal being normally much wider than the section at the opposite end, the latter section however, being longer, the wide end section after formation having an arcuately formed portion about said axis with a hole therein located on said axis for the purpose described, said arcuately formed portion ending in parts meeting in line edges to form a contact for a conductor coming from the tube, the narrower but longer end section having its opposite edges turned toward each other and having its free end tapered for ease in assembly, the formation to the rear of the tapered end being U-shaped in cross section so as to grip the walls of said polygonally shaped hole in said panel when forced into the hole and hold the terminal in operable position on the panel, the tapered end having means therein to receive a circuit conductor.

5. A contact terminal for mounting an electrical device, such as a sub-miniature thermionic tube having conductors extending therefrom, on a panel of insulating material having a hole therein comprising, a member formed from sheet stock of suitable metallic material, said member initially having a plurality of sections each of different width and length and each section being arcuately formed in the same general direction and having two oppositely disposed parts which are substantially symmetrical about a common axis through all sections, the wider end section having its parts formed to meet in edge contact and having a hole in its arcuate portion on the axis to receive a conductor coming from the device, the middle section having its oppositely disposed parts spaced wider than the panel hole to act as a stop on the panel and the narrow end section having its oppositely disposed parts formed to grip into the wall of the panel hole to hold the terminal in the panel and having means at its end to receive a circuit conductor.

6. A contact terminal for mounting an electrical device in a hole of a panel of insulating material comprising a member of suitable resilient metallic material, said member being made of sheet stock and having before forming a plurality of sections each of greater width from one end to the other of said member and each section being substantially symmetrical about a central longitudinal axis through the member, the end section of the greatest width being curvilinearly formed in the same general direction so its edges

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meet in a line contact and having a clearance hole located on said axis to pass a conductor coming from said device whereby the conductor will go between said meeting of edges, which form a contact surface longer than the diameter of said hole, the end section of the narrowest width being curvilinearly formed so its edges will grip the walls of the panel hole to hold the member in the panel, the free end of this section having means for attaching a circuit conductor thereto and an intermediate section between said end sections having its sides curvilinearly formed but having a wider spread than the diameter of the panel hole so the side edges adjacent the narrow end section will engage the panel and act as a stop for said member.

FERNALD S. STICKNEY.

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