

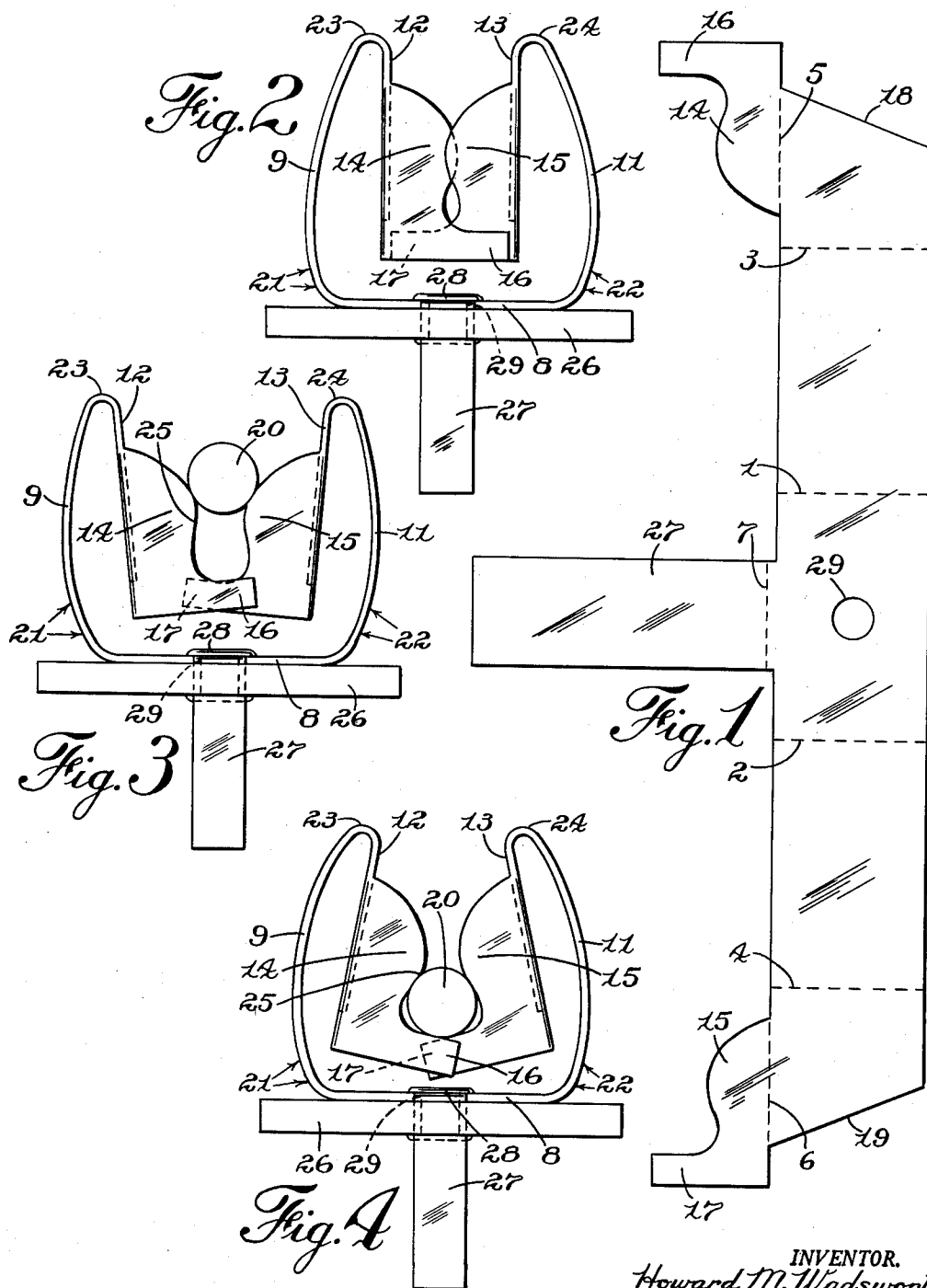
March 13, 1956

H. M. WADSWORTH
UNIVERSAL MOUNTING CLIP

2,738,486

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2 Sheets-Sheet 1



WITNESS:

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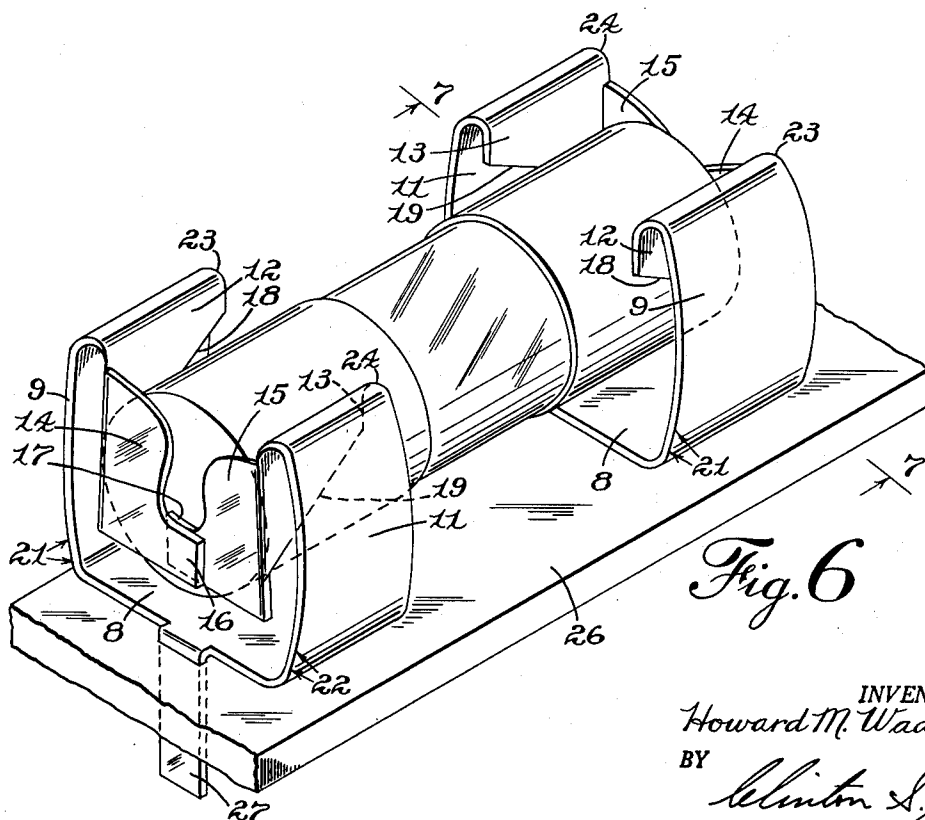
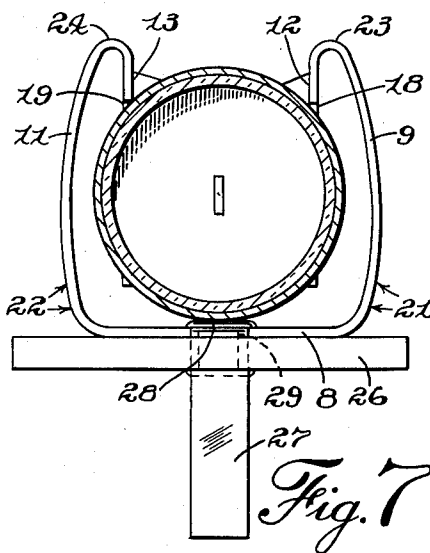
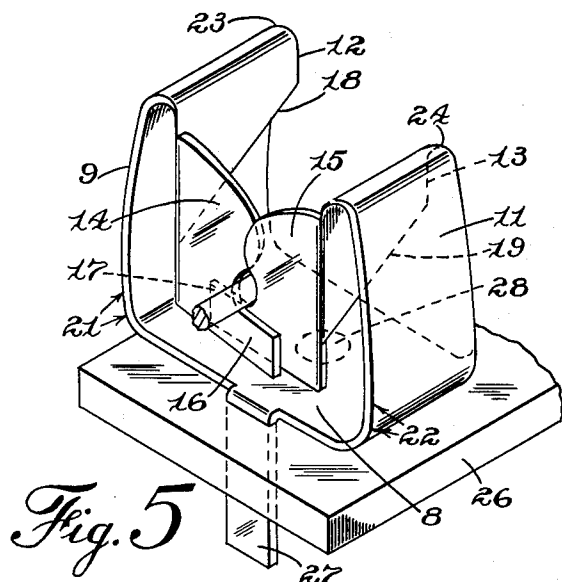
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UNIVERSAL MOUNTING CLIP

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7 Claims. (Cl. 339—258)

The present invention relates to a universal mounting clip for electrical conductors and more particularly to a miniature elastic clip or clamping device for detachably holding electrical conductors including wires, rods or cylindrical elements such as fuses.

The current trend in development of commercial electronic devices involves the conflicting requirements of reduction in size and increase in complexity of the functional units. Marked advances have been made in the development of miniature and so-called "sub-miniature" components, but the provision of mounting means for these components of correspondingly reduced size with requisite security of attachment has proved very difficult.

It is an object of the present invention to provide a novel mounting clip for electrical circuit components, which while occupying very little space, provides an exceptionally secure mechanical connection, with intimate electrical contact.

It is another object to provide such a device which is so formed that its gripping elements are very elastic and thus able to conform themselves to wide variations in sizes of conductors to be received.

It is another object to provide such a device in which the elastic gripping elements form a shock mount for the unit supported thereby, while providing a secure anchorage irrespective of accelerational or set-back forces.

It is another object to provide such a device in which the gripping elements are so formed and arranged that when the element to be mounted is pressed between them beyond a certain point, they grasp and wedge the element down onto its seat.

It is another object to provide such a device in which the gripping elements are interleaved with each other in such manner as to provide mutual stiffening and support against lateral deflection or deformation.

It is another object to provide such a device incorporating elastic arms having primary gripping elements which arms are formed to provide a second, larger receptacle for elements such as fuses of the capsule type which are beyond the capacity of the primary clamping portions of the clip.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing, in which

Fig. 1 is a plan view on an enlarged scale of the blank from which the clip is formed;

Fig. 2 is an end view of the completed clip;

Fig. 3 is an end view of the clip with an electrode such as the end pin of a crystal diode pressed part way into the clip;

Fig. 4 is a similar view showing the pin fully entered into the clip;

Fig. 5 is a perspective view of a clip as used to mount a wire of smaller diameter such as the lead from a fixed condenser or resistor;

Fig. 6 is a perspective of a cartridge type of fuse mounted in a pair of clips; and

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Fig. 7 is a section taken substantially on the line 7—7 of Fig. 6, showing the manner in which the gripping elements bite into and securely hold the fuse.

In Fig. 1 of the drawing there is illustrated a blank of suitable elastic metal of high electrical conductivity. The blank is marked off by dotted lines 1, 2, 3, 4, 5, 6 and 7 in the region of which places the material is to be bent in the formation of the clip. The portion of the blank between the lines 1 and 2 forms the base of the clip as indicated by the numeral 8 in Fig. 2. The arms extending from the base are bent upwardly, starting at the lines 1 and 2 so as to form bowed arms which normally converge slightly as shown at 9 and 11 in Fig. 2. These arms are bent back on themselves at the regions of lines 3 and 4 of Fig. 1 and from thence extend vertically downward in parallel relation as shown at 12 and 13 in Fig. 2, terminating a short distance above the base 8.

As shown in Fig. 1, the terminal portions of the arms of the blank are provided with projections 14, 15 having sinuous contours merging into straight-edged fingers 16, 17 respectively. In forming the clip, these projections are bent at right angles on the dotted lines 5 and 6 in such manner that in the completed clip they face each other and form a pair of gripping jaws, with the fingers 16, 17 overlapping each other. The curved edges of the projections 14, 15 are so inclined toward the bases of the adjacent fingers 16, 17 respectively that they cooperate to form a tapered or tear-drop shaped opening for the reception of the element to be mounted. It will be readily apparent that this structure has a high degree of elasticity in proportion to its size due to the folded shape of the arms, and also because of the fact that since the gripping surfaces are on the edges of the terminal portions 12, 13 of the arms, the arms yield torsionally as well as by bending.

The operation of the clip in receiving and grasping the article to be mounted therein is illustrated in Figs. 3 and 4. When an element such as a pin 20 of a diode cartridge is pressed between the jaws 14, 15 as shown in Fig. 3, the arms 9 and 11 bend outwardly in the regions 21, 22 immediately above the base 8, in view of the fact that the effective leverage of the pressure exerted on the pin 20 is at this time quite long. Conversely, however, the elbows 23, 24 where the arms 9 and 11 are bent back on themselves are not substantially flexed at this time because the leverage tending to do so is short.

When the pin 20 is pressed further into the clip beyond a dead center position indicated approximately at 25, the relationship of the leverages above mentioned is reversed, the elbows 23, 24 now flex and at the same time the bowed portions of the arms 9 and 11 spring back toward their original position. This causes the curved surfaces of the jaws 14, 15 to squeeze the pin between them and snap it down against the fingers 16, 17, and during this movement the edges of the jaws bite into the surface of the pin, penetrating any superficial grease or corrosion so as to secure a perfect metal to metal contact.

In Fig. 5 of the drawing the clip is illustrated with a smaller element such as a wire in its jaws. In this case the clip is originally set with its gripping jaws 14, 15 overlapping, and some of this overlap may be retained after the wire is inserted as shown. The action of the jaws in seizing and making intimate contact with the wire is the same as previously described.

In order to stiffen the clip against distortion laterally, that is, axially of the element mounted therein, the projections 14, 15 and fingers 16, 17 are off-set slightly so that they overlap in opposite relation to each other. That is, as shown in Fig. 2, projection 15 on arm 11 laps over the projection 14 of arm 9, whereas the finger 16 of arm 9 overlaps the finger 17 of arm 11. The terminal portions of the two arms thus reinforce each other and

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provide maximum stiffness laterally while permitting an unusual amount of latitude in size of the element to be inserted in the clip.

As best shown in Figs. 6 and 7 the bent back portions 12, 13 of arms 9, 11 comprise secondary clamping means for receiving elements of larger diameter than can be accommodated by the primary clamping jaws 14, 15 above described. For this purpose the ends of the arms of the blanks are cut off on a bias as shown at 18 and 19 in Fig. 1. When the clip is formed, these edges assume the position best seen in Fig. 6, and the portions in tangential relation to the cylindrical surface of the fuse scrape and bite into the surface while forcing the fuse down onto the base 8 as indicated in Fig. 7.

For mounting the clip on a panel or base 26, the tang 27 of the clip is bent at the line 7 in Fig. 1 to extend down through an opening in the panel and suitable means such as a rivet 28 traversing a central opening 29 in the base is used to anchor the clip to the panel.

Although but one embodiment of the invention has been shown and described in detail, it will be understood that changes may be made in the precise design and arrangement of parts without departing from the scope of the invention.

I claim:

1. An elastic mounting clip for electrical circuit components comprising a base portion, a pair of arms extending in spaced relation substantially normal to the base, the terminal portions of said arms being bent back on themselves in substantially parallel relation, each arm having on its terminal portion a curved projection and a contiguous straight-edged finger, the projections and fingers being formed and bent laterally substantially at right angles to said arms and extending toward each other to form cooperating jaws having two angularly related points of contact with a cylindrical circuit component gripped therebetween.

2. A mounting clip as set forth in claim 1 in which the edge of each curved projection is inclined toward the base of the adjacent finger to provide a tapered opening between them, the two jaws thus cooperating to wedge the element mounted in the clip down onto said fingers and form a shock mount for the element.

3. An elastic mounting clip for cylindrical elements of electrical circuits comprising a base portion, a pair of arms, each extending upwardly from the base to an elbow and then downwardly toward the base in spaced substantially parallel relation; the downwardly extending portions being formed with diagonal edges obliquely tangent to the cylindrical surface of the element mounted therebetween with substantially point contact and correspondingly high unit pressure.

4. An elastic mounting clip for electrical circuit components comprising a base portion, a pair of arms extending in spaced relation substantially normal to the base, the terminal portions of said arms being bent back on

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themselves in substantially parallel relation, each arm having on its terminal portion a curved projection and a contiguous straight-edged finger, the projections and fingers being formed and bent laterally to extend toward each other and form cooperating gripping jaws; in which the projections and fingers of the arms overlap in opposite relation to each other and mutually reinforce each other against lateral deflection.

5. An elastic mounting clip for electrical circuit components comprising a base portion, a pair of arms extending in spaced relation substantially normal to the base, the terminal portions of said arms being bent back on themselves in substantially parallel relation, each arm having on its terminal portion a curved projection and a contiguous straight-edged finger, the projections and fingers being formed and bent laterally to extend toward each other and form cooperating gripping jaws; in which the projections are on the juxtaposed edges of said terminal portions of the arms whereby the insertion of the element to be mounted in the jaws applies a torsional force to the arms.

6. An elastic mounting clip for cylindrical elements of electrical circuits comprising a base portion, a pair of arms, each extending upwardly from the base to an elbow and then downwardly toward the base in spaced substantially parallel relation; the downwardly extending portions being formed with diagonal edges arranged to clamp between them the cylindrical surface of the element to be mounted with substantially point contact and correspondingly high unit pressure; in which the downwardly extending portions of the arms are provided with projections which extend across the space between said clamping portions and confine the element in the clip.

7. An elastic mounting clip for cylindrical elements of electrical circuits comprising a base portion, a pair of arms, each extending upwardly from the base to an elbow and then downwardly toward the base in spaced substantially parallel relation, the downwardly extending portions being formed with diagonal edges arranged to clamp between them the cylindrical surface of the element to be mounted with substantially point contact and correspondingly high unit pressure; in which said points of contact of the diagonal edges of the arms of the clip with the cylindrical surface of the element to be mounted are substantially above the horizontal diametral plane of the element whereby the compressive force of the clip presses the element down on the base.

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