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3,061,811

ELECTRONIC COMPONENT HOLDER

Filed Nov. 12, 1959

2 Sheets-Sheet 1

Fig. 1.

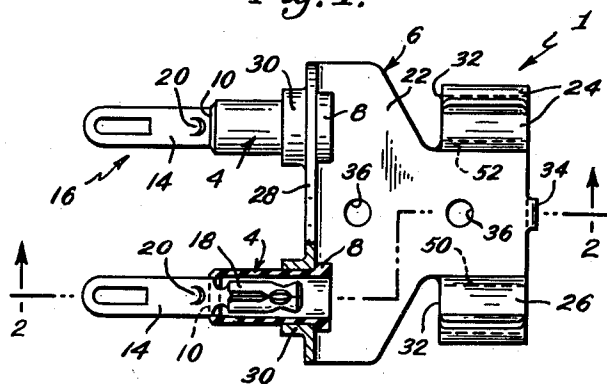


Fig. 2.

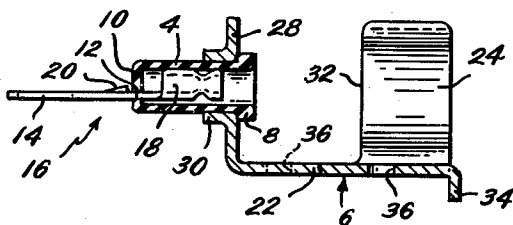


Fig. 3.

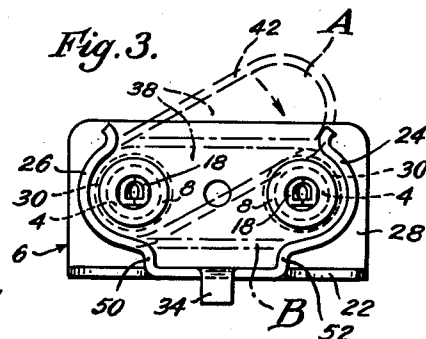


Fig. 4.

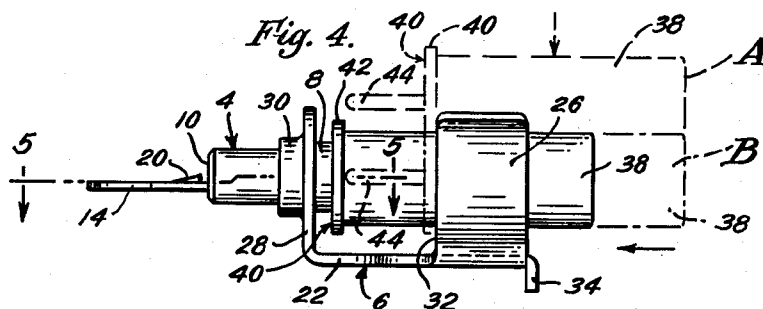
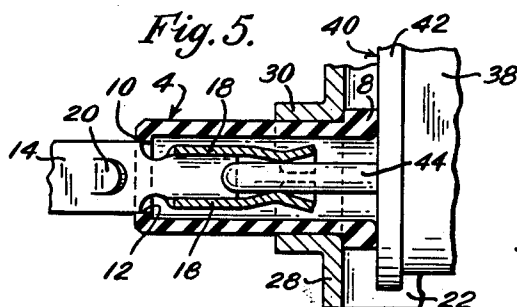


Fig. 5.



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2 Sheets-Sheet 2

Fig. 6.

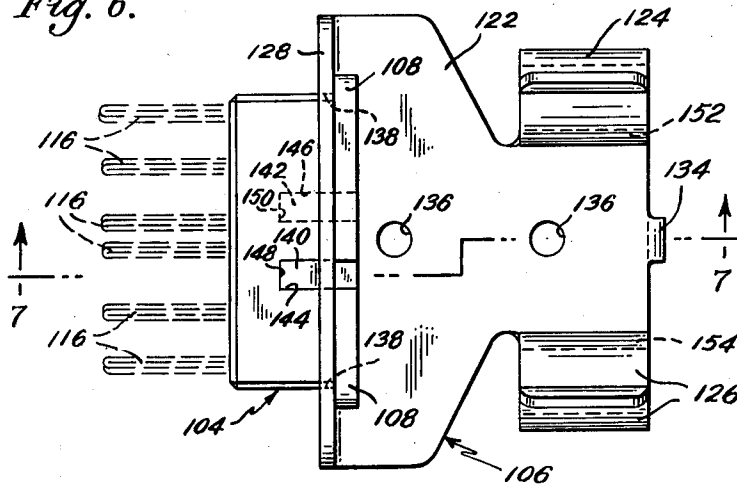
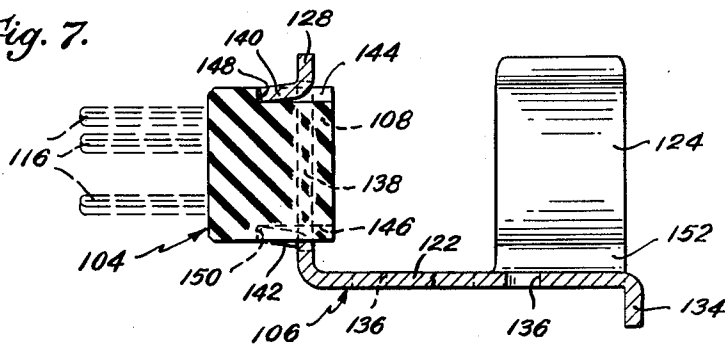


Fig. 7.



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1

3,061,811

ELECTRONIC COMPONENT HOLDER

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4 Claims. (Cl. 339-66)

This invention relates to holders or clamps for electronic components, and in particular, for clamps for crystal cartridges; that is, clamp for holding encapsulated frequency controlling piezo-electric crystals to transmitting and receiving chassis.

Among the several advantages and objects of the invention may be noted the following:

The provision of a clamp for holding crystal cartridges which is formed of sheet metal, the provision of a clamp of the aforesaid kind which provides for the automatic retention therein of terminal receiving parts; the provision of clamps of the aforesaid kinds as to which the insertion or detachment of a crystal cartridge is accomplished with simplicity and ease, and yet which provides for utmost security of clamping when the cartridge is inserted; the provision of a clamp for holding a crystal cartridge in which a two-step operation is required for insertion or removal, thus guarding against accidental or inadvertent removals; the provision of a clamp for crystal cartridges in which the insertion comprises a sequence of transverse and longitudinal motions; the provision of clamps of the foregoing kinds which are shake-proof and vibration-proof; and the provision of a clamp of any of the foregoing classes which is simple to make, and simple to use. Other objects and advantages will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangement of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which two embodiments of the invention are illustrated:

FIG. 1 shows a plan view, partly in section, of one embodiment of this invention;

FIG. 2 is a sectional elevation of the FIG. 1 embodiment, taken in the direction of sight lines 2—2 thereon;

FIG. 3 is an end view of the FIG. 1 embodiment, showing (in dotted lines) an initial position of a crystal cartridge being inserted therein;

FIG. 4 is a side view of the FIG. 1 embodiment, showing (in dotted lines) an initial position of a crystal cartridge being mounted therein and (in full lines) the crystal cartridge fully mounted;

FIG. 5 is a sectional elevation of a position of FIG. 4 given to illustrate more clearly certain details of construction, and taken in the direction of sight lines 5—5 of FIG. 4;

FIG. 6 is a plan view of a second embodiment of the invention; and

FIG. 7 is a sectional elevation of the FIG. 6 embodiment.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

One of the problems encountered in using electronic components, particularly those that are encapsulated in containers having externally projecting terminals thereon, is that of providing means to hold the container or capsule to a chassis in a firm and vibration-proof manner, and yet at the same time provide that changing or replacing the component be done in a simple and rapid manner. Since large numbers of such components are used, it is also a criterion that the holder or clamp be relatively inexpensive and adapted to mass production.

2

It must also be readily adaptable to receiving several kinds of terminal arrangements.

It is the general purpose of this invention to provide a solution to the above requirements, and those first set forth.

Referring now to FIG. 1, there is shown a clamp 2 of this invention comprising the two parts 4 and 6. Part 4 is made of electrically insulating material having resilience and contains terminal engaging pieces, and its exact structure is not a part of this invention. It is obtainable on the open market, and hence will be described now only in general terms. The scope of this invention includes just the part 6 without the part 4. Therefore, as indicated above, the invention primarily concerns part 6, but has as one embodiment the combination of parts 4 and 6 now being described.

Part 4 is of either machined or molded plastic, such as Teflon or nylon, and comprises a tube having at one end the outwardly lying shoulder 8, and at the other end the closure 10. A slender rectangular hole 12 is provided in closure 10 which is adapted to receive therethrough the shank 14 of the terminal engaging clip indicated generally by numeral 16. The inner end of clip 16 is provided with wings 18 folded in tubular fashion, the wings 18 being adapted to receive in frictional engagement the terminals of the electric component. A spur or tab 20 struck out from the shank 14 serves (in conjunction with the inner ends of wings 18) to hold the clip within the plastic tube 4.

The part 6 whose construction is a feature of this invention, is made from sheet metal such as spring steel, Phosphor bronze, or a hardened and heat treated alloy of beryllium and copper. It comprises the flat body portion 22, the wings 24 and 26 (in this embodiment shown as curved), and the platform or flange 28. Of course, if the electronic component is rectangular in cross-section, the wings will be flat-sided to conform to the sides of the component. As shown, two holes are first punched in the flange 28 and then an extrusion operation is performed on each to provide the walls 30—30 as shown. Each of these "flanged" holes receives by a squeeze fit the tubular terminal receiving piece 4 described above. The squeeze fit, combined with the "memory" or resilience of the plastic material, plus the sharp edge of the cylinders 30, securely anchors the tubes 4 in place.

As shown, only two such parts 4 are illustrated, but it is within the scope of this invention to provide one or a plurality.

Bottom or flange 28 is at approximately right angles to body 22, and the terminal receiving members 4 are positioned at the proper distance above the body portion 22 to receive properly the terminals of the crystal cartridge or other component.

As indicated above, the wings 24 and 26 are curved into component-engaging shape by conventional forming operations, and it will be noted that a space or clearance is left between the flange 28 and the inner edges 32 of the wings. Its purpose will be described below.

A locating tab 34 and mounting holes 36 are provided, if desired, these to be positioned as described.

Referring now to FIGS. 3, 4 and 5 in particular, there is shown the afore-described clamp with an encapsulated component 38, for example, a crystal cartridge, being inserted therein. Such crystal cartridges may have, as shown, a bottom 40 which is soldered to the casing. In such construction, an edge 42 usually projects beyond the casing. This bottom is usually a header plate and has projecting therefrom and therethrough the terminals 44 which are connected to the electrical parts inside the can or capsule.

It is now seen why a space or clearance is left between flange 28 and inner edges 32 of the wings 24 and 26. It

is to provide clearance so that the cartridge can be inserted (see FIG. 3) first against one wing and then is snapped down to be engaged by the other wing, the extending edge 42 being adjacent the inner edges 32, and the terminals 44 clearing the flange 28 and any portions or shoulders of the terminal receiving members 4, for example, the shoulders 8. This FIG. 3 position is also shown in dotted lines in FIG. 4, the dotted lines A representing an initial position (in both figures), the dotted lines B representing the second or snapped-down position.

After position B is reached, the crystal cartridge is slid longitudinally in the holder toward flange 28. The terminals 44 enter their respective terminal-receiving members, and therein are mechanically and electrically engaged by the wing portions 18, as shown in FIG. 5. In this forward or inner position, the crystal cartridge is firmly yet resiliently held by the wings 24 and 26 against any tendency to become detached from the clamp or holder; and the pressure of wings 24 and 26, as well as the frictional engagement of the terminals 44 by the foresaid wings 18, prevents longitudinal sliding of the crystal cartridge.

It will be noted that the wings 24 and 26 rise from the flat body portion 22 through the upturned relatively stiff side portions 50 and 52. By this means, an off-set is provided which assures that when the crystal cartridge is held firmly embraced by the wings, as described above, the cartridge is held raised somewhat above the body portion 22, as shown in FIGS. 3 and 4. This provides clearance for mounting screws in holes 36, and also permits a slight transverse resiliency of the cartridge in the wings, so as to permit best alignment of the terminals in their respective sockets.

Referring now to FIGS. 6 and 7, there is shown a second embodiment of the invention in which again the embodiment comprises the two parts 104 and 106. In this instance part 104 again is made of molded plastic such as any of the non-resilient urea-resins, but in this instance it contains a plurality of terminal engaging clips 116 shown here by dotted lines because the construction of such clips and their engagement in the part 104 is well known in the electronic art, and is not a part of this invention.

Part 106 is provided with the flat body portion 122, the flange 128 at right angles thereto, and the wings 124 and 126 which are adapted to receive (as in the FIGS. 1-5 embodiment) the crystal cartridge or other component. The wings may be curved as shown, but in any event are shaped to conform to the shape of the electronic component. A tab 134 and mounting holes 136 are also preferably provided, just as before.

In this embodiment, a single large hole 138 is provided in flange 128, and is of proper shape and dimensions to receive smoothly the molded piece 104. A pair of tabs 140 and 142 dependent from flange 128 and projecting from the edge of hole 138 are provided and are bent as shown. The molded piece 104 is provided with the shoulder portions 108, and with the two grooves or slots 144 and 146, these grooves having groove ends 148 and 150, and being adapted to receive tabs 140 and 142.

When the part 104 is inserted in hole 138 with the respective tabs and grooves in register, the part 104 is shoved in until shoulders 108 bear against flange 128. At this position, the tabs 140 and 142 snap down into grooves 144 and 146, with the tab ends abutting the respective groove ends 148 and 150. This prevents withdrawal of the molded part 104 from the flange.

The insertion of a component cartridge into this FIGS. 6 and 7 embodiment is accomplished exactly as described for the FIGS. 1-5 embodiment, a clearance being provided between flange 128 and the inner edges 132 of wings 124 and 126 for the same reasons as previously described.

As described in the FIGS. 1-5 embodiment and for the same reasons as there given, the wings 124 and 126 rise from the relatively stiff portions 150 and 152, thus providing the off-set or clearance similar to that described in the FIGS. 1-5 embodiment.

In both embodiments, the terminal receiving parts 4 and 104 have been described as being made of certain kinds of electrical insulating plastics. It is apparent, of course, that other electrically insulating materials can be used, provided they have the resilience required for the FIGS. 1-5 embodiment, and the non-resilience required for the FIGS. 6-7 embodiment. Ceramics can also be in the latter embodiment.

It is also clear that one of the great advantages of the invention is that the parts 6 and 106 can be made on automatic stamping and forming presses by progressive dies, since these parts are one-piece. This leads to high speed mass production and great economy of manufacture.

In view of the above, it will be seen that the several objects of the invention are achieved, and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. An electronic component holder comprising a substantially flat body portion having an integral upwardly extending flange at one end thereof, said flange being disposed substantially perpendicular to the plane of said body portion, a pair of oppositely disposed, spaced wing portions extending upwardly from opposite side edges of said body portion, said wing portions being spaced from said flange with the lengths of said wing portions extending in a direction substantially perpendicular to the plane of said flange, said wing portions cooperating to define a clamp for resiliently receiving and maintaining a component therebetween, the upper edges of said wing portions being spaced so as to enable a component to be forced downwardly into said clamp, said flange extending upwardly for at least a distance substantially equal to the height of said wing portions, said flange being provided with at least one hole therein, and a socket of electrically insulating material mounted in said hole and secured against movement in a direction perpendicular to the plane of said flange, said socket being provided with at least one recess therein, said recess being adapted to slidably receive the male contact of a component clamped between said wing portions when the component is slid toward said flange, said recess having a female contact therein adapted to be engaged by the male contact when the latter is slid into said recess whereby to establish an electrical contact.

2. A spring-clip holder for an electronic component having an elongated body with one or more rigid leads of predetermined length protruding from one end of the component body in a direction substantially parallel to the length of said body, said holder comprising a sheet-metal body portion having an integral flange extending upwardly at one end thereof at approximately right angles to the plane of said body portion, a pair of oppositely disposed wing portions extending upwardly from opposed side edges of said body portion with the lengths of said wing portions being in a direction substantially perpendicular to said flange, said wing portions cooperating to define a clamp for resiliently receiving and maintaining the component, the upper edges of said wing portions being spaced so as to enable the component to be forced downwardly into said clamp, the edges of said wing portions nearest to said flange being spaced from said flange a distance greater than the length of said leads, said flange being provided with at least one hole therein, and a socket of electrically insulating material mounted in said hole and secured against movement in a direction perpendicular to the plane of said flange, said socket being provided with at least one recess therein, said recess being adapted to slidably receive the lead of the component clamped between said wing portions when the component is slid toward said

5

flange, said recess having a female contact therein adapted to be engaged by the lead of the component when the latter is said into said recess whereby to establish an electrical contact.

3. In combination with an electronic component having an elongated body with one or more rigid leads of predetermined length extending from one end of said body in a direction substantially parallel to the length of said body, a spring-clip holder comprising a sheet-metal body portion having an integral flange extending upwardly at one end thereof at approximately right angles to the plane of said body portion, a pair of oppositely disposed wing portions extending upwardly from opposed side edges of said body portion with the lengths of said wing portions being in a direction substantially perpendicular to said flange, said wing portions cooperating to define a clamp resiliently receiving and maintaining said component, the upper edges of said wing portions being spaced so as to enable said component to be forced downwardly into said clamp, said flange being provided with at least one hole therein, and a socket of electrically insulating material mounted in said hole and secured against movement in a direction perpendicular to the plane of said flange, said socket being provided with at least one recess therein, said recess being adapted to slidably receive the lead of said component when the latter is slid toward said flange, said recess having a female contact therein adapted to be engaged by the lead of said component when the latter is slid into said recess whereby to establish an electrical contact.

4. In combination with an electronic component having an elongated body with an outstanding rim at one end thereof and one or more rigid leads of predetermined length extending from said one end in a direction substantially parallel to the length of said body, a spring-clip holder comprising a sheet-metal body portion having an

6

integral flange extending upwardly at one end thereof at approximately right angles to the plane of said body portion, a pair of oppositely disposed wing portions extending upwardly from opposed side edges of said body portion with the lengths of said wing portions being in a direction substantially perpendicular to said flange, said wing portions cooperating to define a clamp resiliently receiving and maintaining said component, the upper edges of said wing portions being spaced so as to enable said component to be forced downwardly into said clamp, the edges of said wing portions nearest to said flange being spaced from said flange a distance greater than the combined length of said leads and thickness of said rim whereby said component may be snapped into the space enclosed by said wing portions with said rim clearing said edges of the wing portions and the ends of said one or more leads clearing said flange, said flange being provided with at least one hole therein, and a socket of electrically insulating material mounted in said hole and secured against movement in a direction perpendicular to the plane of said flange, said socket being provided with at least one recess therein, said recess being adapted to slidably receive the lead of said component when the latter is slid toward said flange, said recess having a female contact therein adapted to be engaged by the lead of said component when the latter is slid into said recess whereby to establish an electrical contact.

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