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PANEL INTERIOR MOUNTING MEANS

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Fig. 1.

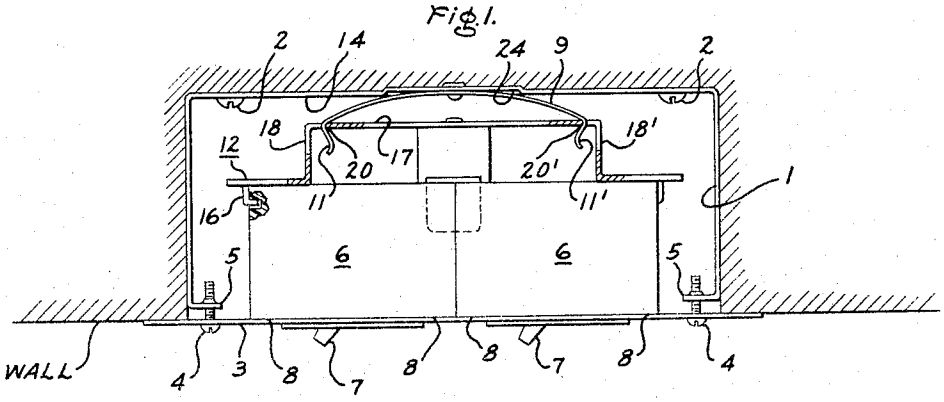
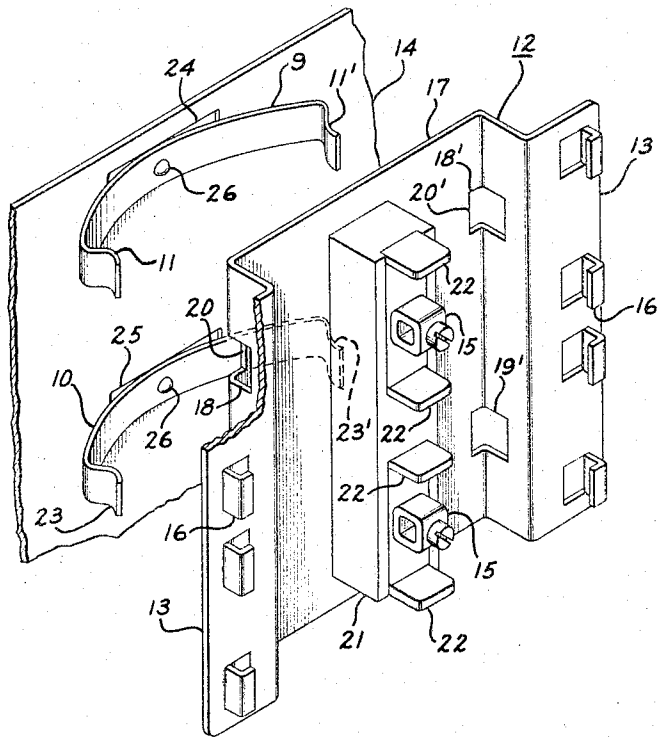


Fig. 2.



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PANEL INTERIOR MOUNTING MEANS

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4 Claims. (Cl. 317—119)

My invention relates generally to apparatus assemblies in which an inner component of the assembly is resiliently mounted within an outer casing thereof. More particularly, my invention relates to electrical apparatus assemblies, such as panelboards and load-centers, in which one or more electrical devices are resiliently mounted in spaced relation to the interior back wall of an enclosing casing.

An important object of the invention is to provide an apparatus assembly having a resilient interior mounting arrangement whereby one component assembly of the apparatus may be securely mounted within an outer casing in such a manner as to be easily attachable and detachable without the necessity of tools or auxiliary fastening means.

Another object of the invention is to provide a resilient interior mounting construction and arrangement for mounting electrical devices, which mounting means can be fabricated and assembled by simple operations, which requires only a very small number of parts, and yet is rugged and durable.

An additional object is the provision of such a mounting construction which is easily adaptable for use in supporting assemblies of greatly varying size and weight.

Another object is to provide a mounting construction for enclosed electrical apparatus in which the resilient spring means is small and compact and which, in use, does not detract from wiring-gutter space, and is not in a position to be contacted by or entangled with loose wiring.

In general, in accordance with my invention, I provide a curved resilient mounting strip securely fastened in substantially tangential relation to the back wall of the casing to which an inner component is desired to be mounted, and a generally channel-shaped supporting base or tray adapted to be held thereby. The outer ends of the mounting strip are free to move toward and away from the back wall of the casing against the inherent resilience of the strip. The distance between these free ends varies, however, during such movement; the distance being greater when they are pressed toward the back wall than when they are moved away from the wall. Each of the free ends of the mounting strip carries a retaining clip preferably formed integral with the mounting strip and constructed to engage an edge of an opening in the rear wall of the channel-shaped supporting base. The supporting base for the electrical device or devices to be supported, comprises a metallic tray having a generally channel-shaped central portion with integral sidewise extending flanges along each side. A pair of opposed openings are provided in the channel portion at locations corresponding to those of the retaining clips. These openings are preferably located at the corners formed between the side walls of the channel portion and the back wall thereof, and extend partly into each. Each opening provides an edge to be gripped by a retaining clip, as well as other edges to prevent movement of the base in the plane of the back wall. The retaining clips of each resilient strip may be spread apart in order to

become engaged with corresponding edges of a pair of opposed openings, by merely pressing the unit against the clips. Once engaged, the device cannot be disengaged by merely pulling away from the mounting strip because such motion only tends to make the engagement tighter. Vertical movement is prevented by upper and lower edges of the openings. The device can be easily disengaged by pressing it further against one of the sides of the mounting strip, thereby spreading the retaining clips apart, and then pivoting one side out of engagement with its retaining clip. The size of the supporting base may be varied, and one, two, or more resilient mounting strips may be used, spaced along the length of the base, the number depending on the size and weight of the devices or assembly to be mounted.

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, together with further objects and advantages thereof may be easily understood by referring to the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a cross-sectional view of a panelboard assembly embodying the invention, shown mounted in a wall, with its front flush with the surface of the wall.

Figure 2 is a perspective view of a portion of the apparatus of Figure 1 in a disassembled condition.

Referring to Figure 1, I have shown my invention in one form embodied in a panelboard assembly including a box-type outer casing 1, a supporting tray or base 12 mounted within casing 1 by means of detachable resilient strip 9 in accordance with my invention, and carrying electrical devices 6 thereon. The casing 1 is adapted to be retained in position in or on a wall or other support by suitable fastening means such as by means of screws 2. A cover 3 is provided which closes the open front of the enclosure 1, and when the box is mounted in a wall as shown, overlies the wall on all sides of the enclosure 1. The cover 3 is attached to the enclosure 1 by suitable means, such as by screws 4, which engage in-turned flanges 5 of the enclosure 1, and which also draw the cover 3 toward and against the wall, as will be described. Supported within the enclosure 1, on mounting base 12, by the mounting means to be more fully described, are electrical devices 6. It will be understood that my invention may be employed with various types of electrical devices. For purposes of illustration, however, my invention is shown as used in an electric circuit breaker panelboard, incorporating electrical devices 6 comprising automatic circuit breakers, each having one end supported on the flanges 13, and the other end supported on electrical contact blades 22 comprising the end portions of U-shaped conductive straps mounted on insulating base 21 and provided with connectors 15 for connection with a source of electrical current. The cover 3 is provided with suitable apertures through which handles 7 of the electrical devices 6 project, and are accessible for manual operation. The electrical devices 6 also have shoulders 8, in engagement with the inner side of cover 3, by means of which engagement the electrical control devices 6 are restrained from outward movement. Screws 4, which attach the cover 3 to the enclosure 1, also draw the cover 3 inwardly against the aforesaid shoulders of the control devices 6.

The resilient mounting strips and the supporting base 12 are shown more particularly in Figure 2. Each of the members 9 and 10 comprises an elongated curved spring strip having its outer portions 11—11' and 23—23' return bent, to form retaining clips, the ends of the retaining clips being outwardly flared for a purpose to be described.

The back wall 14 of the enclosure 1 is provided with depressions or recesses 24—25 adjacent the point of con-

tact between the resilient strips 9 and 10 and the back wall 14, which recesses closely conform to the portion of the resilient clips 9 and 10 adjacent thereto, whereby the resilient members 9 and 10 are prevented from rotating about the rivets 26. This construction provides a rigid substantially non-rotatable mounting with the use of only a single fastening means for each clip. It also permits evenly-distributed flexure of the spring strips when in use.

The supporting base 12 comprises a generally channel-shaped tray having a back wall 17 and outwardly extending side flanges 13 provided with retaining elements 16. The base 12 is also provided with pairs of apertures 18—18' and 19—19' adapted to admit the return-bent retaining clip portions 11—11' of the resilient supporting strip 9 and the corresponding portions 23—23' of the strip 10, respectively. In the mounted condition, as shown in Figure 1, the edges 20—20' of the openings 18—18' rest within the angles formed between the retaining clip portion 11—11' and the body of resilient clip 9. The distance between the edges 20—20' of the apertures 18—18' is slightly greater than the distance between the said angle portions of the strip 9, in its free-standing position. Because of this, the resilient strip 9 firmly engages and grips the supporting base 12 at edges 20—20'. A similar engagement exists between the resilient strip 10 and the corresponding edges of the apertures 19—19'. The resilient strips 9 and 10, as well as the pairs of apertures 18—18' and 19—19' are longitudinally spaced along the supporting base 12. When the supporting base 12 is in engagement with the resilient clips 9 and 10, as indicated in Figure 1, it is resiliently but firmly held in spaced relation to the back wall of the enclosure 1.

When the supporting base 12 is in mounted position, as shown in Figure 1, an inward pressure upon the base causes the edges 20—20' of the apertures 18—18' and the corresponding edges of the apertures 19—19' to bear against the resilient strips 9 and 10 so as to tend to cause each to open out or flatten. In tending to return to their normal condition, the resilient members 9 and 10 resiliently urge the supporting base 12 outwardly toward the front of the enclosure 1. At the same time, the accidental removal or dislodging of the supporting base 12 from the retaining elements 9 and 10 when the cover 3 is removed is prevented by the retaining clip portions which tend to close toward each other as the tray is pulled forward, gripping it more tightly. The supporting base 12 may nevertheless be readily released from its engagement with the resilient strips 9 and 10 by disengaging the retaining clip portions from the edges of the apertures by any convenient method, such as by pressing outwardly on the outwardly flared ends of the retaining clip portions by hand or with a suitable instrument such as a screw driver. Alternately, unit 12 may be removed by pressing the entire unit inwardly so as to spread the strips 9 and 10, and then rotating one side of the unit out of engagement with the retaining clips at that side. The supporting base 12 is easily inserted in the enclosure 1 and in engagement with the retaining elements 9 and 10, by merely pressing it against the outwardly flared end portions of the clips, thereby causing the simultaneous spreading-apart of the clips to permit engagement of edges therewithin. Alternately, supporting base 12 may be tipped slightly so as to first engage the edges of the apertures located at one side of the base 12, e. g., the right hand side, and then rotated inwardly so as to engage the corresponding edges of the apertures located to the opposite side. The outwardly flared ends of the retaining clip portions facilitate this assembly and disassembly. Upon assembly of the base 12, with its associated control units 6 on retaining members 9 and 10, the enclosure cover 3 may be attached. The enclosure cover 3 is placed in position with the handles 7 of the control devices 6 projecting through corresponding apertures in the cover 3, and the screws 4 are inserted into the flanges

5, and tightened. During this tightening operation, the cover 3 is first brought into engagement with the shoulders 8 of the control devices 6. Continued turning of the screws 4, draws the cover 3 as well as the control devices 6 and the supporting base 12 inwardly against the back wall of the enclosure 1, at the same time resiliently stressing the resilient retaining strips 9 and 10.

It will now be observed that my improved mounting construction includes a resilient spring supporting member which is small and which when in use is completely hidden by the mounting base. Thus there is no possibility of interference between such mounting springs and the electric wiring leading to and from the electrical devices.

As will also be observed, each of the resilient strips 9 and 10 supports the base portion at two spaced-apart points on the base 12. This reduces the number of resilient supports or springs required by one-half as compared with prior constructions.

Furthermore, as shown in the figures, my improved mounting construction makes possible the use of such arcuate spring retaining clips in multiple, with a corresponding size base or tray, as required by the size or number of the device or devices to be supported. Thus, for example, in an electric circuit breaker panelboard of the type shown, but of only one-half the size of that shown, that is, one having provision for only four circuit-breakers instead of eight, only one resilient mounting strip is required. On the other hand, for panelboards larger than that shown, more strips are easily added for supporting the greater weight. For a panelboard of the type shown but having provision for mounting sixteen circuit breakers, for instance, three such mounting strips may be used, spaced longitudinally along the length of the base similar to the construction shown. Thus one standardized mounting spring is used to provide mounting means for a large range of sizes of devices.

It will be seen that I have provided an electrical apparatus assembly with resilient supporting means for apparatus mounted within an outer enclosure which is attachable and detachable without the necessity of tools or auxiliary fastening means, which is simple and inexpensive to manufacture and assemble, but nevertheless rugged and effective in use, which does not detract from wiring-gutter space and includes a resilient supporting member which is entirely concealed in use and shielded from contact with loose wires.

I claim:

1. An enclosure for housing and supporting an electrical device having a supporting base including spaced apart edge portions, comprising a generally rectangular box having an open front, and mounting means for said electrical device, comprising at least two continuous elongated arcuate resilient strips each non-rotatably attached at a point intermediate its ends to the back wall of said enclosure, the opposite ends of said strip being spaced away from said back wall, and return-bent hook portions carried by said ends and adapted to extend around said spaced apart edge portions releasably to retain said supporting base therebetween, said resilient strips extending in parallel relation with the end portions thereof in alignment in a predetermined direction perpendicular to the length of said strips, the shortest distance between said strips being substantially greater than the width of said strips, and the distance between said end portions of each of said strips and said point of attachment of said strip to said back wall being substantially greater than said width of said strip.

2. An enclosed electrical apparatus assembly comprising a generally rectangular box, an electrical device in said box and including a base portion, an elongated arcuate resilient strip having its opposite ends return bent to provide retaining clip portions for releasably holding said base portion therebetween, a single fastening means fastening said resilient strip to the back wall of said box

at its mid-portion, a shallow recess formed in the said back wall of said box adjacent the said mid-portion of said resilient strip, said recess being only slightly wider than the width of said resilient strip at its said mid-portion, whereby rotation of said resilient strip in a plane parallel to the said back wall of said box about said single fastening means is substantially completely prevented.

3. An electrical panelboard construction comprising a generally rectangular enclosing box having an open front, at least two continuous elongated arcuate resilient strip members each fixedly attached at the midpoint thereof to the back wall of said box and having its opposite ends spaced away from said back wall, an electrical device within said box, a supporting base for said electrical device having spaced-apart edge portions, return-bent hook portions carried by said opposite ends of said strip and disposed to extend around said spaced-apart edge portions of said supporting base to releasably retain said supporting base therebetween, said resilient strips extending parallel to each other and having their end portions in alignment with each other, said edge portions of said supporting base being notched at the point of engagement with said resilient strip, each said resilient strip having

a length between its point of engagement with said supporting base and its point of attachment to said back wall substantially greater than the width of said strip and the shortest distance between said strips also being substantially greater than said width of said strip, whereby the length of the edge portion of said base engaged by each of said resilient strips comprises a relatively small portion of the overall dimension of said base in the direction of said edge portion.

4. The invention as set forth in claim 3 wherein said supporting base comprises a generally channel-shaped sheet metal member having a pair of apertures in the web portion of said channel disposed to receive the said return-bent portions of said strips respectively.

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