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2,422,589

REINFORCED CONTACT CLIP

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Fig. 1.

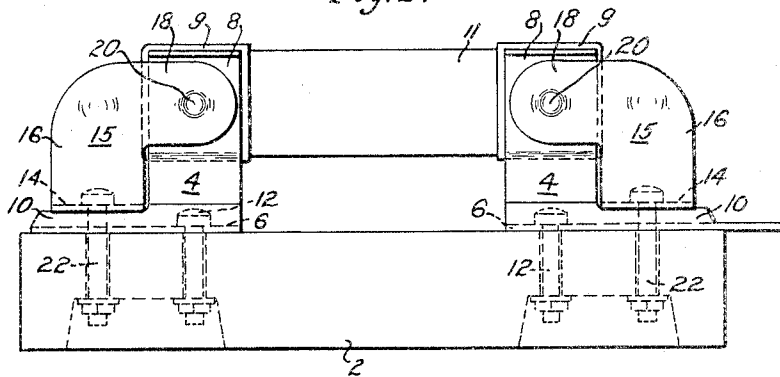


Fig. 2.

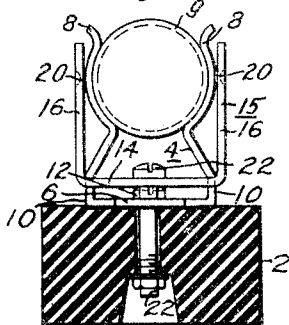


Fig. 3.

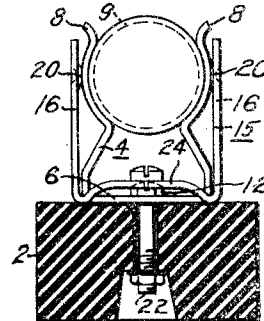
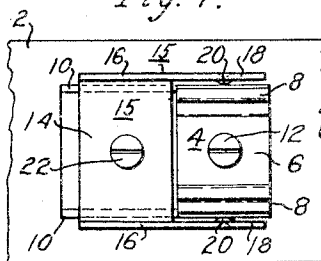


Fig. 4.



WITNESSES:

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REINFORCED CONTACT CLIP

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6 Claims. (Cl. 200—134)

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This invention relates, generally, to electrical apparatus and, more particularly, to reinforcing means for electric contact structures.

It has been found desirable to provide spring reinforcement for electric contact members which are subjected to heating and to bending stresses, especially for contacts of the jaw or clip type, for example, the clips used to receive the terminals of a fuse.

One object of this invention is to provide relatively simple contact reinforcing means which is readily adjustable to vary the contact pressure.

Another object of this invention is to provide novel contact reinforcing means which is readily adjustable to vary the contact pressure without disturbing the contact to which it is applied.

Another object of this invention is to provide novel reinforcing means for contact clips which is readily adjustable without disturbing the structure engaged by the clips.

Another object of this invention is to provide novel reinforcing means for contact clips which is readily adjustable to vary the pressure on the clips over a wide range.

These and other objects of this invention will become more apparent upon considering the following detailed description of preferred embodiments thereof, when taken in connection with the attached drawing, in which:

Figure 1 is a side elevation view of a fuse and fuse mounting, utilizing the reinforcing means of this invention;

Fig. 2 is an end view of the assembly shown in Fig. 1, with the supporting base shown in section;

Fig. 3 is a view similar to Fig. 2 but showing a slightly modified form of reinforcing means; and

Fig. 4 is a top plan view of the contact clip and reinforcing means shown in Figs. 1 and 2, with the fuse removed.

The contact reinforcing means constituting this invention is shown on the drawing as applied to contact clips for receiving a cartridge type of fuse. Referring to Fig. 1, the fuse mounting is secured on a base 2 of insulating material, such, for example, as a molded insulating material. Contact clips 4 are located on base 2 at points spaced apart a distance corresponding

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to the space between the terminals of the fuse which is to be mounted therein. Each contact clip 4 is substantially U-shaped in section, including an integral bight portion 6 seated on base 2 and spaced legs 8 extending upwardly from the base and shaped to conform to the contour of the fuse terminals. The fuse 11 illustrated, is circular in section, and provided with terminal ferrules 9 at each end adapted to be mounted in contact clips 4, so that the outer ends of the clips are given a circular contour to conform to the contour of fuse terminals 9. The bight portion 6 of each fuse clip 4 is extended longitudinally outwardly from fuse 11, and is provided with short upwardly extending side flanges 10, for a purpose to be described. Each fuse clip 4 is secured to base 2 by a bolt 12 extending through the bight portion of the clip and through the base.

Contact clip reinforcing members 15 are provided for each clip and these reinforcing members are also generally U-shaped in form, comprising a bight portion 14 and substantially straight side legs 16 spaced apart a distance substantially equal to the distance between the outer sides of the contact clips at the points where they engage the fuse terminals. Reinforcing members 15 may be of any desired resilient material, such, for example, as spring steel. Each leg 16 of reinforcing members 15 is provided with a lateral extension 18, and each such extension is provided with an inwardly struck portion 20 providing projections of limited area on the inner surfaces of extensions 18. As shown in Figs. 1, 2, and 4, reinforcing members 15 are adapted to be supported on each contact clip, with the bight portion 14 of each reinforcing member seated on flanges 10 of each clip. A bolt 22 is provided to extend through apertures provided in bight portion 14 of each reinforcing member 15 and through extended bight portion 6 of each clip and through the base, for securing the reinforcing members in operative position. It will be noted that when the reinforcing members 15 are mounted in operative positions, the extensions 18 thereof extend along side legs 8 of the contact clips in the region thereof engaged by fuse terminals 9, and that projections 20 are positioned substantially centrally of the

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area of engagement of the contact clips and fuse terminals.

In assembling the parts described above, bolt 22 need not be tightened until after a fuse 11 has been mounted in contact clip 4. Thereafter bolt 22 may be tightened, and this will cause the bight portion 14 of reinforcing clips 15 to bend along a line parallel with the longitudinal axis of fuse 11 in a manner to cause the upper ends of legs 16 to approach each other, and exert pressure on the legs 8 of each contact clip 4. Bolts 22 may be adjusted to provide any desired pressure on the contact clips, and since the reinforcing members 15 are of resilient material, the pressure which they exert will not be affected by changes in temperature due to heating of the fuse terminals, because they will yield upon expansion thereof due to their resilient properties.

The structure shown in Fig. 3 is substantially the same as that shown in Figs. 1, 2 and 4, and like reference numerals are, therefore, used to designate the like parts. The structure of Fig. 3 differs from that previously described in that bight portion 6 of each contact clip is not provided with a laterally extending base portion and flanges 10. Instead, reinforcing members 15 are seated directly on base 2, and are provided with a bight portion 24 which is upwardly curved in section. This structure operates to apply pressure to the contact clips in substantially the same manner as in the previously described construction, in that taking up bolt 22 will tend to flatten bight portion 24 and cause the outer ends of legs 16 of the reinforcing member to approach each other and exert pressure on the contact clips.

It will be observed that the adjusting bolts 22 for the reinforcing members for varying the pressure applied to the contact clips, are positioned beyond each end of fuse 11 so as to be readily accessible without removing the fuse from contact clips 4. The amount of spring adjustment possible is limited only by the permissible stress of the material comprising reinforcing member 15, because, in the embodiment of the invention shown in Figs. 1, 2 and 4, the supporting flanges 10 may be made any desired height, and in the structure of Fig. 3, bight portion 24 may be given any desired curvature, so that the bight portions of the reinforcing members may be bent the necessary amount by bolt 22 to obtain any desired pressure on the contact clips. Furthermore, by making reinforcing members 15 of extra heavy spring material, the fuse terminals may, in effect, be clamped in the contact clips, but sufficient flexibility will always be provided for temperature expansion, because of the resilient character of the reinforcing members. It will be noted that projections 20 on extensions 18 of each reinforcing member are positioned substantially centrally of the contact area between the contact clips and fuse terminals, so that even though the legs of the reinforcing members bend or are moved angularly relative to the contact clips when pressure is applied thereto, pressure will always be applied substantially centrally of the legs of the contact clips, and substantially perpendicular to the contact surface point.

Having described preferred embodiments of the invention in accordance with the patent statutes, it should be understood that the invention is not to be limited to the particular structures shown herein, because it will be obvious to persons skilled in the art that many changes and modifications may be made in these particular structures without departing from the broad spirit and scope of

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this invention. Thus, for example, the novel reinforcing means of this invention is not limited to the application thereof for contact clips adapted to receive terminals of round cross-section or even to contact clips adapted to receive fuse terminals. Obviously, the invention is equally applicable to fuses having knife blade type of terminals, and to contacts for knife switches or the like. Therefore, it is desired that the invention be interpreted as broadly as possible, and that it be limited only as required by the prior art.

I claim as my invention:

1. In apparatus of the type described, a base, a contact clip secured on said base, reinforcing means for said clip comprising a substantially U-shaped reinforcing member of resilient material having leg portions adapted to engage the sides of said clip, and adjusting means engageable with the bight portion of said member independently of the securing means of said clip for varying the distance between at least outer portions of said leg portions.

2. In apparatus of the type described, a contact clip, reinforcing means for said clip comprising a substantially U-shaped reinforcing member of resilient material having leg portions adapted to engage the sides of said clip, means for transversely bending an intermediate portion of the bight portion of said member for varying the distance between at least outer portions of said leg portions, and said leg portions having portions limited in area projecting therefrom toward intermediate portions of the sides of said clip for limiting the area of engagement of said reinforcing member and clip.

3. In apparatus of the type described, a support, a contact clip mounted on said support and adapted to receive electrical conducting means extending from one side thereof, reinforcing means for said clip comprising resilient reinforcing members mounted on said support at the opposite side of said clip and extending into engagement with the sides of said clip, respectively, in the region of said conducting means when the latter is received in said clip.

4. In apparatus of the type described, a contact clip adapted to receive electrical conducting means extending from one side thereof, reinforcing means for said clip comprising resilient reinforcing members supported at the opposite side of said clip and extending into engagement with the sides of said clip, respectively, in the region of said conducting means when the latter is received in said clip, and adjusting means engaging means integral with said members at said opposite side of said clip for varying the force exerted on the sides of said clip, whereby said adjusting means is accessible even when said conducting means is received in said clip.

5. In apparatus of the type described, a support, a contact clip mounted on said support and adapted to receive electrical conducting means extending from one side thereof, reinforcing means for said clip comprising a substantially U-shaped resilient reinforcing member having the bight portion thereof mounted on said support at the opposite side of said clip and the leg portions of said member having laterally extending portions extending into engagement with the sides of said clip, respectively, in the region of said conducting means when the latter is received in said clip.

6. In apparatus of the type described, a contact clip, reinforcing means for said clip comprising a substantially U-shaped reinforcing member of resilient material having leg portions

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adapted to engage the sides of said clip, spaced projecting means supporting the bight portion of said member, and adjusting means engageable with the bight portion of said member intermediate said spaced supporting means for varying the distance between at least outer portions of said leg portions.

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