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This invention relates to electric cartridge fuse assemblies of the kind comprising a base of electrically insulating material on which are mounted two electric fuse contacts each of which has means for electrical connection to a conductor of a flexible electric cable or to an electric busbar and, separately formed with respect to and detachably engageable with the insulating base, a carrier of electrically insulating material on which an electric cartridge fuse link is so supported that, when the carrier is detachably engaged with the base, the terminals of the cartridge fuse link are in direct or indirect electrical connection with the electric fuse contacts of the base. Electric cartridge fuse assemblies of this kind will hereinafter, for convenience, be referred to "as of the kind described".

In electric cartridge fuse assemblies of the kind described, it is common practice to employ cartridge fuse links having longitudinally extending substantially flat blade contacts electrically and mechanically

connected to the fuse link terminals and to use, as the fuse contacts mounted on the insulating base, socket contacts in which the blade contacts of the cartridge fuse link are resiliently gripped. However, where a cartridge fuse link having flat blade contacts is employed in a cartridge fuse assembly of the kind

described, there is the possibility that, in certain circumstances, for example if the insulating carrier should be damaged, a user may be tempted to introduce a cartridge fuse link not supported by the insulating carrier into electrical engagement with the fuse contacts with the result that there is a serious risk that the user may receive an electric shock which could be fatal.

With a view to eliminating the possibility that a user may, for some reason, be tempted to dispense with the insulating carrier, it has been proposed to provide, on the insulating carrier, supplementary electric contacts with which the flat blade contacts or other terminals of the cartridge fuse link are electrically connected and to employ, in the insulating base, socket contacts of such a form that they will resiliently grip the supplementary electric contacts on the insulating carrier but will not resiliently grip the flat blade contacts of a cartridge fuse link. As a result, a cartridge fuse link cannot be electrically connected to the socket contacts of the insulating base unless the cartridge fuse link is mounted on the insulating carrier and electrically connected to the supplementary contacts. Whilst such an assembly eliminates the possibility that an unsupported cartridge fuse link might be connected to the fuse contacts of the insulating base, the provision of supplementary contacts

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on the insulating carrier substantially increases the complexity of the assembly and its cost.

It is also common practice to shroud each fuse contact on the insulating base by a cover of
5 electrically insulating material having a slot or other opening for passage of the flat blade contact of a cartridge fuse link into electrical connection with the socket contact. Whilst such shrouds substantially eliminate risk that a user correctly introducing a
10 cartridge fuse link supported on an insulating carrier into electrical connection with the fuse contacts of an insulating base will receive an electric shock, they do not prevent a user from introducing an unsupported cartridge fuse link into electrical connection with the
15 fuse contacts and, as the fuse link terminals are not shrouded, the serious risk of the user receiving an electric shock remains.

It is an object of the present invention to provide an improved electric cartridge fuse assembly of the kind
20 described which eliminates the possibility that an unsupported cartridge fuse link can be introduced into electrical connection with the fuse contacts of the insulating base, which is simple in construction and inexpensive to produce.

According to the invention in the improved cartridge fuse assembly of the kind described, each fuse contact of the insulating base is protected by a preformed shroud of plastics insulating material, which shroud has
5 a slot or other opening through which a blade contact of a cartridge fuse link supported on the insulating carrier can be introduced into electrical connection with the underlying fuse contact and is constrained to slide transversely of the base between a first position
10 in which the slot or other opening overlies the fuse contact and a second position, transversely spaced with respect to the first position, in which the shroud prevents a blade contact of a cartridge fuse link from effecting electrical connection with the underlying fuse
15 contact, the transversely-slidable shroud being urged by associated resilient means into said second position, and the insulating carrier has means for engaging each shroud in such a way that, as the carrier is detachably engaged with the base, said shroud-engaging means on the
20 carrier engages each shroud and causes it to slide transversely of the base against the action of its associated resilient means to said first position, thereby to permit introduction of the blade contacts of the cartridge fuse link through the slots in the shrouds
25 and into electrical connection with the underlying fuse contacts.

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Preferably, the resilient means associated with one of the shrouds urges the shroud in a transverse direction opposite to that in which the other of the shrouds is urged by its associated resilient means.

5 Each resilient means may be separately formed with respect to its associated shroud and may, for example, be a spring but, preferably, each resilient means comprises a resilient arm integral with one side edge of its associated shroud.

10 Where, as is preferred, the base has an upstanding peripheral wall consisting of two side and two end walls, preferably each shroud is of substantially inverted L-shape with the end edge of one limb of the inverted L slidably engaged in a groove in an end wall
15 of the insulating base, with one side edge of this limb slidably engaged in a groove in one side wall of the base and with the resilient arm integral with the other side edge of the limb slidably engaged in a groove in the other side wall of the base. To prevent
20 unintentional sliding movement of the shroud in a direction away from the neighbouring end wall, a marginal end portion of the other limb of the shroud may abut an upstanding rib or other abutment on the bottom wall of the base or the former limb of the shroud may
25 have adjacent each of its side edges an upstanding rib which effects a snap fit behind a rib protruding downwardly into the associated groove in the side wall of the base.

For effecting transverse sliding movement of each shroud, preferably one shroud has, integral with the latter limb of the inverted L, at least one wall having a surface which tapers downwardly towards the bottom wall of the base and away from the resilient arm and the shroud-engaging means on the insulating carrier comprises at least one wall having a surface of complementary shape, the arrangement being such that, as the insulating carrier is detachably engaged with the base, these surfaces inter-engage to cause the shroud to slide transversely of the base against the action of the resilient arm towards such first position.

To facilitate access to each fuse contact to enable a conductor of a flexible electric cable or an electric busbar to be electrically connected to the fuse contact, preferably each shroud is also constrained to slide lengthwise of the base between a first or service position in which it overlies its associated fuse contact and a second position nearer the middle of the base in which the fuse contact is exposed to a sufficient extent to permit the electrical connection to be made. e.g. by means of a clamping screw. Preferably, to provide for lengthwise sliding movement of the shroud, the grooves in the side walls extend at least to adjacent the central transverse plane of the base, the shroud being held captive in these grooves, thereby eliminating risk of loss of a shroud.

For reasons of ease of assembly and economy, preferably the insulating base is divided longitudinally of its length into two separately formed base parts which are permanently or detachably secured together.

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The improved electric cartridge fuse link assembly of the present invention may include the features of the electric cartridge fuse link assembly described in the specification of our Patent Application No. 84/

5 filed on the same day as this application.

The invention is further illustrated by a description, by way of example, of a preferred electric cartridge fuse assembly with reference to the accompanying drawings, in which:-

10 Figure 1 is a fragmental isometric view of the insulating base and associated insulating fuse link carrier of the preferred electric cartridge fuse link assembly, and

Figures 2 to 4, respectively, are front, plan and 15 side views of a shroud of the insulating base shown in Figure 1.

Referring to Figure 1, the cartridge fuse assembly comprises an insulating fuse link carrier 1, an insulating base 2 provided with electric fuse contacts 20 (not shown) and two slidably engageable shrouds 3. The insulating fuse link carrier 1 comprises a base 17 and two longitudinally spaced upstanding walls 18 having slots 19 in which the blade contacts of a cartridge fuse link (not shown) engage. The insulating base 2 is

longitudinally divided into two base parts 4, 5, which are permanently secured together trapping two electric fuse contacts (not shown) in their required positions.

Each of the electric fuse contacts is protected by a preformed shroud 3 which engages in grooves in the side and end walls of the insulating base 2 and is capable of slidable movement, both transversely and lengthwise of the insulating base.

As will be seen on referring to Figures 2 to 4, the shroud 3 is formed from a plastics insulating material, is of an inverted L-shape and has an upper limb 7 with resilient arm 8 extending from one of its side edges, and a lower limb 9. Both of the limbs have a slot 6 extending therethrough to enable insertion of a fuse link blade contact into the underlying electric fuse contact. The lower limb 9 is provided with a wall 10 having a surface 11 which tapers inwardly from one of the side walls 12 of the insulating base 2 and downwady towards the bottom wall of the base when the shroud is positioned in the insulating base with its end edge 13 engaged in groove 14, its side edge 15 engaged in groove 16, its resilient arm 8 engaged in groove 20 and the lower end of the lower limb 9 effecting a snap fit

behind an upstanding rib (not shown) in the bottom wall of the insulating base 2.

The shroud 3 is constrained to slide transversely of the insulating base 2 between a first position in which the slot 6 overlies the fuse contact and a second position, transversely spaced with respect to the first position, in which the shroud prevents a blade contact of the cartridge fuse link from effecting electrical connection with the underlying fuse contact. The shroud 3 is urged by the resilient arm 8 into the second position.

When a cartridge fuse link mounted on the carrier 1 is to be inserted into the base 2, surfaces 21 on the walls 18 of complementary shape to the tapered surfaces 11 engage the tapered surfaces 11 and cause each shroud 3 to slide transversely of the base against the action of its associated resilient arm 8 to said first position, one shroud moving in the opposite transverse direction to the other shroud, to enable the blade contacts of the cartridge fuse link to pass through the slots 6 and into electrical connection with the underlying fuse contacts.

To facilitate access to each fuse contact to enable a conductor of a flexible electric cable or electric busbar to be electrically connected to the fuse contact, the shroud 3 is also constrained to slide lengthwise, 5 between a first or service position in which it overlies its associated fuse contact, and a second position, nearer the middle of the insulating base 2 in which the fuse contact is exposed to a sufficient extent to permit the electrical connection to be made.

CLAIMS

1. An electric cartridge fuse assembly of the kind described wherein each fuse contact of the insulating base is protected by a preformed shroud of plastics insulating material, which shroud has a slot or other opening through which a blade contact of a cartridge fuse link supported on the insulating carrier can be introduced into electrical connection with the underlying fuse contact and is constrained to slide transversely of the base between a first position in which the slot or other opening overlies the fuse contact and a second position, transversely spaced with respect to the first position, in which the shroud prevents a blade contact of a cartridge fuse link from effecting electric connection with the underlying fuse contact, the transversely-slidable shroud being urged by associated resilient means into said second position, and wherein the insulating carrier has means for engaging each shroud in such a way that, as the carrier is detachably engaged with the base, said shroud-engaging means on the carrier engages each shroud and causes it to slide transversely of the base against the action of its associated resilient means to said first position, thereby to permit introduction of the blade contacts of the cartridge fuse link through the slots in the shrouds and into electrical connection with the underlying fuse contacts.



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2. An electric cartridge fuse assembly as claimed in Claim 1, wherein the resilient means associated with one of the shrouds urges the shroud in a transverse direction opposite to that in which the other of the shrouds is urged by its associated resilient means.

3. An electric cartridge fuse assembly as claimed in Claim 1 or 2, wherein each resilient means comprises a resilient arm integral with one side edge of its associated shroud.

4. An electric cartridge fuse assembly as claimed in Claim 3 in which the insulating base has an upstanding peripheral wall consisting of two side and two end walls, wherein each shroud is of substantially inverted L-shape and has the end edge of one limb of the inverted L slidably engaged in a groove in one end wall of the insulating base, one side edge of said limb engaged in a groove in one side wall of the base, and the resilient arm integral with the other side edge of said limb engaged in a groove in the other side wall of the base.

5. An electric cartridge fuse assembly as claimed in Claim 4, wherein a marginal end portion of the other limb of the inverted L abuts an upstanding rib or other abutment of the bottom wall of the base.

6. An electric cartridge fuse assembly as claimed in Claim 4, wherein the limb of the shroud has adjacent each of its side edges an upstanding rib which effects a snap fit behind a rib protruding downwardly into the associated groove in the side wall.



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7. An electric cartridge fuse assembly as claimed in Claim 4,5 or 6, wherein each shroud has, integral with the other limb, at least one wall having a surface which tapers downwardly towards the bottom wall of the base, and wherein the shroud-engaging means on
- 5 the insulating carrier comprises a wall having a surface of complementary shape, the arrangement being such that, as the insulating carrier is detachably engaged with the base, the surfaces inter-engage to cause the shroud to slide transversely of the base against the action of the
- 10 resilient arm towards said first position.
8. An electric cartridge fuse assembly as claimed in any one of the preceding Claims, wherein each shroud is constrained to slide lengthwise of the base between a first or service position in which it overlies its
- 15 associated fuse contact and a second position nearer the middle of the base in which the fuse contact is exposed to a sufficient extent to permit the electrical connection to be made.
9. An electric cartridge fuse assembly as claimed in
- 20 Claim 8, wherein, to provide for lengthwise sliding movement of the shroud, the grooves in the side walls extend at least to adjacent the central transverse plane of the base, the shroud being held captive in these grooves.



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10. An electric cartridge fuse assembly as claimed in
any one of the preceding Claims, wherein the insulating
base is divided longitudinally of its length into two
separately formed base parts which are permanently
5 secured together.

11. An electric cartridge fuse assembly substantially as
hereinbefore described with reference to and as shown in
the accompanying drawings.
