

PATENT SPECIFICATION

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(54) FUSED TERMINAL BLOCK

(71) We, ELECTRONIC & FLUORESCENT ACCESSORIES LIMITED, a British company, of 808—809 Oxford Avenue, Slough Trading Estate, Slough, Buckinghamshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a fused electrical terminal block, to a fuse link holder, and to a method of assembling the fused terminal block. Such a block is used for example in connecting a fluorescent lighting tube to a mains supply, or for light power machinery up to say 10 amps and 250 volts.

Objects of the invention are to provide such a block which is convenient and safe to use and in which a fuse link can be readily and safely changed; to provide for the use of alternative fuse link sizes; and to provide for ready assembly of a fused terminal block.

According to this invention a fused electrical terminal block comprises i) an insulating body shaped to enclose and locate electric terminals and a removable fuse link, the body having a through cavity to receive the fuse link and fuse link terminals, and ii) an internal cover plate hingedly connected to the body and movable to a position in which it closes one end of the cavity, the cover plate being so shaped that when it closes the cavity it assists in holding the fuse link terminals in place. Preferably the cover plate has a lip for snap-in fixing of the plate in the cavity-closing position. Preferably the body and the cover plate are made of a thermoplastics material, for example polycarbonate or polypropylene, although a thermoset material may be used. Preferably the hinge connection is made by means of appropriate thinning of the plastics material along the line of hingeing. The terminal block may include a fuse link holder which is slidably removably mountable in the cavity and has a circular aperture to receive and retain a fuse link. The holder may be shaped so that it can be used only to insert a fuse link of the correct

type in the block. Thus a fuse holder of one shape would be used for a B.S. fuse link and a holder of modified shape would be used for a metric fuse link. The block is shaped to receive either holder and to position correctly either fuse link in relation to the fuse link terminals. The holders are also preferably of thermoplastics material. They are "non-removable." One would have a larger aperture for a B.S. fuse link and the other a smaller aperture for a metric fuse link; this smaller aperture would be offset from the centre line, to position the metric fuse link correctly for engaging the fuse link terminals in the block.

The invention also relates to a method of assembling the fused electrical terminal block, in that fuse link terminals are placed in position in the cavity in the block and the cover plate is then moved to the position in which it closes the cavity and assists in holding the fuse link terminals in place. No other fixing means are needed for the fuse link terminals. When the cover plate is in the closed position, they are ready to receive the bared conductor ends and the fuse link.

The invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the terminal block, showing its top face, and of a fuse link holder, showing the direction of movement of the latter for insertion (when a fuse link is fitted to the holder) into the block;

Figure 2 is a top plan of the block, with cover plate open; the terminals, fuse link and fuse link holder are omitted;

Figure 3 is a bottom plan, corresponding to Figure 2;

Figure 4 is an end elevation, looking in the direction of the arrow F of Figure 2;

Figures 5 to 9 are sections on the respective planes V—V, VI—VI, VII—VII, VIII—VIII and IX—IX seen in Figure 2;

Figure 10 is an enlarged detail section showing part of the body of the block and the cover plate, the latter being shown broken, for space reasons;

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Figures 11, 12 and 13 each show side and end elevations and a top plan of respectively one fuse link terminal body, the neutral terminal, and the earth terminal;

5 Figure 14 includes three views of each of a pair of metallic spring clips; and

Figure 15 includes end and side elevations and top and bottom plans of a fuse link holder.

10 Referring to the drawings, a neutral "through" terminal (Fig. 12) is inserted in the neutral tunnel of a block (see "N" on the top face of the block, Fig. 1), an earth "through" terminal is inserted in the earth tunnel (see the earth sign) and two fuse link terminals, each comprising a terminal body in association with a metal spring clip (Figs. 11 and 14) are placed (with the bottom of the block facing upward — Fig. 3) down into a through cavity or slot 1, with their grub screw heads located in holes 1A, 1B. The clips extend across the cavity, which is a vertical through-slot. Then the cover plate 3, with its lug 3A having a lip 3B, is bent about its first and second thin hinges 4 and 5 (formed during moulding of the plastics material of the block, see particularly Fig. 10) and moved from the open position shown in Figures 2 to 6 to the closed position indicated in dotted lines in Figure 5. The lug 3A is pushed into and through a slot 6 and the lip 3B is compressed and then clips or snaps into engagement with one end of this slot 6, also as indicated in dotted lines in Figure 5. Part of the closed cover plate is seen in Figure 1. When the cover plate lug 3A is closed, as seen in Figure 5, its side edges assist in holding the fuse link terminals in place.

40 The hinges 4 and 5 are formed in that the plastics material (of which the block body and the cover plate and the lug and lip are integrally formed) is made thinner along the line of each hinge, as seen in Figures 4, 5, 6 and 10, particularly the latter.

The cover plate 3 has two projections 3C which (see Fig. 1) enter the cavity 1 and abut and thus also assist in holding the fuse link terminals in place.

50 The through cavity or slot 1 is of somewhat cruciform shape as seen in Figures 1, 2 and 3, with two opposed shallow channels 7A and 7B: as shown, channel 7A is wider than channel 7B. This cruciform shape of the slot 1 is to accommodate the fuse holder slidably, which holder, see the top plan in Figure 15, has the same shape, but is very slightly smaller, so as to be received in the slot. This may be understood by reference to the side elevation in Figure 15, in which a fuse link 8C is indicated in dot-dash lines, held in the aperture 8A of the holder, and to Figure 1. Referring to the top and bottom plans of Figure 15, it will be seen that portion 9A of the holder is wider than

portion 9B: since these portions fit the respective channels 7A and 7B, the fuse holder is non-reversibly slidably insertible into the through cavity 1. The end elevation of Figure 14 shows the aperture 8A for a B.S. fuse link and, in dotted lines, the position of a smaller aperture 8B in a holder for a metric fuse link. The axis of aperture 8A is central; in a fuse holder having an aperture 8B, the axis is, as shown, offset, so that a metric fuse link would be held offset, so as properly to engage the fuse link terminal clips when the holder is pushed home into the cavity 1. Since the holders are non-reversible, it is ensured that a metric fuse link engages the clips.

The holder has wings 10 which, as may be understood from Figure 1, close off the slot 1 when the holder is fully inserted; there is thus no risk of a person touching the fuse link or the clips when they are live. The fuse link can only be touched when it is not in contact with the live clips. The holder has a finger grip portion 10A which in use projects from the block.

Figures 11 and 14 show respectively a fuse link terminal body, and left and right hand clips, one of which is positioned in a respective terminal body. The latter has a bore 11 and a threaded bore 11A to receive the usual grub screw (not shown) the projecting head of which is received and located in a respective aperture 1A or 1B, Figure 3, as described above. Each clip has a tongue 12A, which is received in the bore 11, and a curved spring clip portion 12B to grip one conductive end cap of the fuse link. The clip also has a hole 12C which is aligned with the grub screw hole 11A, so that the grub screw retains and locates the clip to the terminal body, and presses the tongue 12A firmly against the bared end of a conductor in the terminal.

Figure 2 shows integrally moulded, tubular, upstanding shields 13 for the six terminal grub screws (not shown). These shields are connected by reinforcing webs, also seen in Figure 1. These tubular shields 13 constitute what may be termed "chimneys" and not only provide for good insulation of the grub screw heads, but simplify and make more certain mechanised feed-in of the screws during assembly.

Aligned bores for a fixing screw are indicated at 14A, 14B, Figures 2, 3, 5 and 8. The fixing screw also passes through aligned bores 15A, 15B of the earth terminal, Figure 13.

The block body, with hinged cover plate and lug, is integrally moulded of plastics material, preferably polypropylene (flame-retardant) or polycarbonate (self-extinguishing) or nylon. These various plastics materials have the necessary resilience or flexibility to permit the "snap-

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in" engagement of the lip 3B with the end of the slot 6. A suitable thermoset plastics material may also be used, but a thermoplastics material is preferred, as permitting more impressions from the tool, as being quicker to mould, and as more readily providing the needed resilience and flexibility.

Our co-pending divisional application No. 18735/75, Serial No. 1,475,502, relates to the fuse link terminal body and a clip, as described above with reference to Figures 11 and 14.

WHAT WE CLAIM IS:—

1. A fused electrical terminal block comprising i) an insulating body shaped to enclose and locate electrical terminals and a removable fuse link, the body having a through cavity to receive the fuse link and fuse link terminals, and ii) an integral cover plate hingedly connected to the body and movable to a position in which it closes one end of the cavity, the cover plate being so shaped that when it closes the cavity it assists in holding the fuse link terminals in place.

2. A block according to claim 1, wherein the cover plate has a lip for snap-in fixing of the plate in the cavity closing position.

3. A block according to claim 1 or claim 2 made of a thermoplastics material.

4. A block according to claim 1 or claim 2 made of a thermoset material.

5. A block according to claim 3 or claim 4, wherein the hinge connection of the cover plate to the body is constituted by a thin portion of either said material along the line of the hinge.

6. A method of assembling a fused electrical terminal block which block comprises i) an insulating body shaped to enclose and locate electric terminals and a removable fuse link, the body having a through cavity to receive the fuse link and fuse link terminals, and ii) an integral cover plate hingedly connected to the body and movable to a position in which it closes one end of the cavity, wherein the fuse link terminals are placed in position in the cavity and the cover plate is then moved to the position in which it closes the cavity and assists in holding the fuse link terminals in place.

7. A block according to any of claims 1 to 5 including a removable fuse link holder having an elongate body portion, with a fuse link receiving aperture extending through the body portion so that in use a fuse link in the aperture extends at right angles to the body portion.

8. An assembly of a block according to any of claims 1 to 5, a pair of fuse link terminals each having an apertured metallic body with a grub screw, and a metallic spring clip which has a tongue shaped so as to be received in the aperture of the metallic body and a curved spring clip portion shaped to receive and retain a conductive end cap of a fuse link, and a fuse link holder having an elongate body portion, with a fuse link receiving aperture extending through the body portion so that in use a fuse link in the aperture extends at right angles to the body portion, wherein the body portion of the holder is shaped to be received in the through cavity, the fuse link receiving aperture of the holder being so disposed that in use a fuse link in the aperture is situated in the through cavity and is gripped by the spring clip portions of the terminals.

9. An assembly according to claim 8, wherein the through cavity has two channels of different widths and the body portion of the holder has parts of different thickness which parts fit the respective channels, whereby the fuse holder is non-reversibly insertible into the through cavity.

10. A fused terminal block constructed and arranged substantially as herein described and shown in Figures 1 to 10, 12, 13 and 15 of the accompanying drawings.

11. An assembly of a terminal block, electric terminals, fuse link terminals, and a fuse link holder with fuse link, constructed and arranged substantially as herein described and shown in the accompanying drawings.

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2. A block according to claim 1, wherein the cover plate has a lip for snap-in fixing of the plate in the cavity closing position.

3. A block according to claim 1 or claim 2 made of a thermoplastics material.

4. A block according to claim 1 or claim 2 made of a thermoset material.

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9. An assembly according to claim 8, wherein the through cavity has two channels of different widths and the body portion of the holder has parts of different thickness which parts fit the respective channels, whereby the fuse holder is non-reversibly insertible into the through cavity.

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