

Electrical Contact Receptacle

This invention relates to an electrical contact receptacle for receiving a flat blade contact and is particularly concerned with such a receptacle for connection to a flat blade fuse, for example of the kind disclosed in UK patent 2,002,976 (28306/78).

Fuses of this kind are used in automobiles, particularly in the USA, and there is an increasing trend for them to be used in automobiles produced in Japan or Europe. Technical requirements are that the fuse should withstand rated circuit currents but will fail at overload currents of other than transient nature. Blade fuses of this kind have been found particularly satisfactory in meeting the requirements at rated currents up to 30 A, but considerable difficulty has been met in providing electrical contact receptacles which maintain satisfactory, releasable, electrical connection without adversely affecting the fuse characteristics. Most known receptacles of reasonable cost and facility of manufacture exhibit such contact resistances that the heat generated at the contact interfaces between the contact receptacles and the fuse adversely affects the characteristics of the fuse and its sensitivity to fuse failure at the appropriate rated current.

Such fuses are customarily mounted in a junction box at which operating circuits are interconnected, and the circuits within the box may be formed by flat

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conductive strips mounted on an insulating lamina, and substantially rigid end portions of the strips are bent out of the plane of the insulating lamina to extend from the box for effecting external connection, for example, to the fuses.

5 Although such end portions may be formed into conventional blade receptacles by suitable stamping and forming, the thickness of metal desirable for ensuring a receptacle of adequate performance is excessive in relation to that required to provide the current carrying capacity in the circuit portion on the insulating lamina.

10 It is an object of the invention to provide an electrical contact receptacle for a flat blade and capable of meeting the requirements of operation with a flat blade fuse in improved manner.

15 According to the invention an electrical contact receptacle for a flat blade comprises a generally flat metal tab having a metal spring clip secured thereto, and is characterised in that the spring clip is formed from a strip-like member having adjacent one end, a pair of wing-like lateral extensions, one on each side and folded over to present turned-in edge portions opposed to a face of the strip-like member to present a receptacle portion for the tab, a strip-like spring extending from the receptacle portion in a direction towards a free end of the tab, first transversely away from a face of the tab, and then in inclined manner towards the face of the tab to a contact

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zone at the face of the tab at which the strip-like spring is bent in arcuately convex manner, facing the tab, to extend away from the tab face in divergent manner.

Suitably the spring clip is secured to the tab by means of an aperture in the receptacle portion, opposite the turned-in edges, engaging a boss formed on the tab face.

Suitably the spring clip at the end opposite to the receptacle portion is bifurcated by a slot extending from the free end to a point between the contact zone and that portion extending transversely away from the tab face.

Suitably at the contact zone the arcuately bent convex portion of each bifurcated spring portion is formed with an indentation presenting a contact boss facing the tab, and the tab is formed centrally with a recess, of approximately one third of the tab width, extending from the contact zone towards the receptacle portion.

The tab at its free end beyond the contact zone is suitably of reduced width, and inclined away from the spring end to present a flared entry for the complementary blade. The reduced width portion is suitably of lesser width than the spacing between the turned-in edges of the receptacle portion to facilitate assembly of the spring clip on to the tab. Additionally the ends of the turned-in edges remote from the contact zone are suitably chamfered and opposite the chamfered portions the base of the receptacle portion is centrally indented to facilitate

insertion of the tab into the receptacle portion and of the boss on the tab into the aperture in the base of the receptacle portion.

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

Figure 1 is a section elevation of an electrical contact receptacle according to the invention;

10 Figure 2 is an elevation viewed from the left hand side of Figure 1;

Figure 3 is an elevation viewed from the right hand side of Figure 1;

Figure 4 is an underside view of the receptacle of Figures 1 to 3, and

15 Figure 5 is a fragmentary perspective view of a receptacle according to the invention, formed on a conductive strip bent out of a lamina circuit structure for use in a junction box.

20 The electrical contact receptacle of Figures 1 to 4 comprises a generally flat tab 1 of conductive metal such as brass or copper, on which is mounted a spring clip 2 which may, for example, be of steel or phosphor bronze. The spring clip 2 is of generally strip-like form having at a lower end a receptacle portion 3 from which extends a
25 spring portion 4. The receptacle portion 3 is formed by a pair of wing-like portions 5 extending one from each side of the strip-like portion, and turned over at one side to

present side edges 6 opposed to a face of the strip-like portion defining a base to the receptacle portion 3.

The tab 1 is formed with an indentation defining a boss 7 on one face engaging an aperture 8 in the base of the receptacle, to secure the spring clip to the tab.

Lower ends of the receptacle side edges 6 are chamfered at 9 to facilitate insertion of the tab 1 into the receptacle portion 3 from its lower end, and the base of the receptacle portion at that end is formed with an indentation 10 presenting an enlarged entry into that end of the receptacle portion for the boss 7.

Above the receptacle portion 3, the strip-like portion 4 extends first away from the tab 1, substantially normally, and is then bent to extend upwardly in inclined manner towards the tab 1 to a contact zone 11 at which the spring portion 4 is bent in arcuate fashion convex towards the tab, to extend away from the tab in divergent manner to define a flared entry for a complementary blade, not shown, between the spring portion 4 and the tab 1, into the contact zone 11.

The spring portion 4 is bifurcated by a slot 12 extending from its upper, free end to a point substantially mid-way between the contact zone 11 and that portion extending away from the tab. At the contact zone 11, the convex portions of the bifurcation are formed with indentations 13 extending towards the tab 1 and defining contact bosses.

The tab 1 is formed centrally with an indentation

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defining a recess 14 facing the spring portion 4 and extending downwardly from the contact zone 11 to the receptacle portion. The indentation, on the side of the tab 1 opposite the spring portion 4, is of width less than the spacing between the turned-in edge portions 6 of the receptacle portion, to facilitate assembly.

Above the recess 14, the tab is of reduced width, having a central tab portion 15, also of width less than the spacing between the edge portions 6, inclined away from the spring portion 4 to assist in defining a flared entry for the complementary blade.

As seen in Figure 5, the receptacle of Figures 1 to 4 may be formed on a tab 1 bent up from a conductive strip 16 mounted on a circuit board lamina 17 adapted to form part of a junction box assembly, for example of the general kind disclosed in our UK patent application 2,022,333.

In assembling the spring clip 2 to the tab 1, the free end of the tab is engaged with the lower end of the receptacle portion 3 and the receptacle portion urged over the tab until the boss 7 engages the aperture 8 under the spring action of the turned-in edge portions 6. Suitably the spring portion 4 is so formed that at this condition the spring portion 4 is flexed by engagement with the tab 1 to give a pre-loading to the spring prior to insertion of the complementary blade.

Alternatively, the receptacle of Figures 1 to 4 may be formed with a crimping ferrule for connection to a

conductor wire. To this end, the tab 1 may be stamped and formed with a U-shaped ferrule for crimping to a wire, and the ferrule may be integrally joined to a carrier strip common to a series of receptacles so that receptacles may
5 be handled in strip-form and applied to wires by automatic or semi-automatic wire terminating apparatus.

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Claims:-

1. An electrical contact receptacle for a flat blade comprising a generally flat metal tab having a metal spring clip secured thereto for reception of the flat blade between the clip and the tab is characterised in that the spring clip (2) is formed from a strip-like member having adjacent one end a pair of wing-like lateral extensions (5) folded over to present turned-in edge portions (6) opposed to a face of the strip-like member to present a receptacle portion (3) for the tab (1), a strip-like spring (4) extending from the receptacle portion (3) in a direction towards a free end of the tab (1), first transversely away from a face of the tab (1) and then in inclined manner towards the face of the tab (1) to a contact zone (11) at the face of the tab (1) at which the strip-like spring (3) is bent in arcuately convex manner, facing the tab (1), to extend away from the tab (1) in divergent manner.

2. An electrical contact receptacle as claimed in Claim 1, characterised in that the spring clip (2) is secured to the tab (1) by means of an aperture (8) in the receptacle portion (3) engaging a boss (7) formed on the tab face.

3. An electrical contact as claimed in Claim 1, characterised in that the strip-like spring (4) is bifurcated by a slot (12) extending from a free end to a point between the contact zone (11) and that portion extending transversely away from the tab (1).



4. An electrical contact receptacle as claimed in Claim 3, characterised in that at the contact zone (11) the arcuately bent convex portion of each bifurcated spring portion is formed with an indentation (13) presenting a contact boss

5 facing the tab (1) and the tab (1) is formed centrally with a recess (14) of approximately one third of the tab width, extending from the contact zone (11) towards the receptacle portion (3).

5. An electrical contact receptacle as claimed in Claim 1, characterised in that the tab (1) at its free end is of reduced width to define a central tab portion (15) inclined away from the spring end to define a flared entry, the tab portion (15) being of widths less than the spacing between the turned-in edges (6).

15 6. An electrical contact receptacle as claimed in Claim 5, characterised in that ends (9) of the turned-in edges (6) are chamfered, and opposite the chamfered portions (9) the base of the receptacle (3) is centrally indented.

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