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- (21) Application No. 1571/78 (22) Filed 14 Jan. 1978
 (44) Complete Specification Published 15 Jul. 1981
 (51) INT. CL.³ H01R 4/48
 (52) Index at Acceptance
 H2E EGK
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(19)



(54) IMPROVEMENTS RELATING TO ELECTRICAL FITTINGS

(71) We, CRABTREE ELECTRICAL INDUSTRIES, LIMITED of British Company of Crabtree House, Aldridge, Walsall West Midlands, 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 is concerned with improvements relating to electrical fittings, particularly of the type (hereinafter referred to as being of the kind specified) comprising a front plate and a housing extending rearwardly from the front plate, the electrical fitting being adapted to be secured to a mounting surface, such as a wall, with the housing extending into a cavity in the mounting surface and the front plate overlying the cavity with a peripheral surface thereof flush with the mounting surface.

Difficulty is encountered in securing conductive wiring to electrical fittings of the kind specified, particularly where conventional screw-terminals are used.

Thus, according to one aspect of this invention there is provided an electrical fitting of the kind specified, comprising an aperture in the housing into which a conductive wire of an insulated cable may be inserted in the establishment of conductive contact between the wire and a terminal of the fitting, wherein the fitting comprises, associated with said aperture, a contact member which is spring-urged into an operative position in which it is arranged so as in use to press against a conductive wire in the aperture to afford conductive contact between the wire and the terminal of the fitting, and to restrain the wire against being withdrawn from the aperture, the electrical fitting comprising a release member which is mounted for pivotal movement with respect to the housing and which comprises an operating portion located within the housing and an operated portion extending from the

housing and which may be moved, by manual engagement of said operated portion, between an operative position in which the operating portion holds the contact member in an inoperative position in which a wire may be inserted into or withdrawn from the aperture, and an inoperative position in which the contact member adopts its operative position.

The contact member may itself provide conductive contact between the wire and the terminal, or may press the wire into engagement with a contact plate which is in conductive engagement with, or which is provided by part of, the terminal.

Thus, in the connection of a conductive wire to the said terminal of the fitting, the wire may be pushed through the aperture of the housing, resiliently moving the contact member from its operative position, into a fully inserted position in conductive contact with the terminal. Subsequently, by operation of the release member the wire may readily be released, in the event that it is desired to change the wire of the fitting.

However, additionally, the release member may be operated to so move the contact member to its inoperative position prior to the insertion of the wire into the aperture: in this manner, the wire itself is not required to resiliently move the contact member, and enables a less robust wire, such as a stranded wire, to be connected to the terminal. Alternatively, or in addition, a stronger biasing may be afforded to the contact member, to provide superior conductive contact between the conductive wire and the terminal, and more firmly to resist inadvertent withdrawal movement of the wire from the aperture.

Preferably the release member comprises a central part which is recessed or otherwise reduced in cross-section, which part is located in a slot provided in a side wall of the housing. Thus, the release member may be

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generally of I-shape in cross-section. In this manner the release member may be secured to the housing in a manner which enables it sufficient freedom of movement to be so manually operated, whilst being retaining captive against separative movement from the housing. Conveniently the release member is located in the slot during assembly of mechanism of the fitting in the housing, and is retained therein by a rear cover of the housing secured subsequent to assembly of the mechanism in the housing. Conveniently on manual operation, the release member bears against the contact member and the rear cover to move the contact member against its resilient bias to its inoperative position, and when released allows the contact member to move to its aperture position.

An electrical fitting of the kind set out above it particularly suitable for use in an electric switch, particularly of the kind for use in conjunction with a "plaster depth" box. Thus, the release member may be located and at all times remain wholly within the confines of the plane of the front plate of the switch and the plane of the rear cover, and by virtue of the fact that the release member rocks against the rear cover, manual operation may be effected by pressing the operated portion towards the front plate of the switch.

There will now be given a detailed description, to be read with reference to the accompanying drawings, of an electrical fitting which is a preferred embodiment of this invention, and which has been selected to illustrate the invention by way of example. In the accompanying drawings:

Figure 1 is a schematic sectional view of the preferred embodiment, with coupling means thereof not in use;

Figure 2 is an elevational view, taken in the direction of the arrow A of *Figure 1*;

Figure 3 is a view corresponding to that shown in *Figure 1*, release means having been moved to permit an electric cable to be inserted into the coupling; and

Figure 4 is a view illustrating the position subsequently adopted by the release means, upon release thereof.

The electrical fitting which is the preferred embodiment of this invention is of the kind specified, being specifically an electric switch for use in conjunction with a "plaster depth" box 6. The switch comprises a front, or face plate 8 and a housing 10 on the inner side of the face plate, the housing comprising a rear cover 12 which may releasably be secured in a position to enclose the switch mechanism within the housing. Apertures, such as that indicated by the numeral 14, are provided in the rear cover and through which in use electric wiring extends into the housing.

For each electrical contact to be established within the housing, there is provided a metal contact member 16, in the form of a spring metal plate pressed into generally V-shape. In use, an engagement part of the contact member engages the conductive wire 18 of an insulated cable 20 inserted into one of the apertures 14 into the housing.

For each electrical contact to be established, there is provided within a side wall of the housing adjacent to the aperture 14 a slot 22, said slot being open rearwardly of the wall of the housing, and being closed by the rear cover when the latter is secured in position.

For each electrical contact to be established, the electric fitting comprises release means in the form of a release member 24 conveniently moulded wholly from plastics material. The release member is conveniently of I-shape in cross-section, comprising an operated portion 26 in the form of a button, an operating portion 28, and a central part 30 of reduced cross-section extending between the portions 26 and 28.

In use, the central part 30 of each release member is located in an associated slot 22, the release member being retained against movement out from the slot 22 by the portions 26 and 28, and by the enclosing of the slot 22 by the rear cover 12.

When it is desired to insert the conductive wire of an insulated cable into the aperture 14, the operated portion 26 of the release member is depressed (in the direction of the arrow A) towards the face plate 8, such movement moving the operating portion 28 of the contact member 16 in the direction of the arrow B. Conveniently, such movement is effected by a rocking or pivotal movement of the release member from inoperative to operative positions about a point of contact with the rear cover 12, as is indicated by the numeral 32 (*Figure 3*).

Such movement of the release member to its operative position, and hence of the contact member to its inoperative position, permits the conductive wire of the insulated cable to be inserted into the aperture 14, and when the release member is subsequently released, the contact member 16 moves to its operative position, trapping the conductive wire against the wall of the housing, within a channel 17, and preventing withdrawal of the insulated cable from the electric fitting (see *Figure 4*), simultaneously moving the release member to its inoperative position, as is shown in *Figure 1*.

Similar movement of the portion 26 of the release member, in the direction of the arrow A, may be carried out to cause the portion 28 of the contact member 16 to be moved again in the direction of the arrow B (*Figure 3*) when it is required to remove the cable 20 from the electric fitting.

The pivotal movement of the release member allows a strongly biased contact member to be used, whilst allowing such movement of the contact member as is necessary to effect insertion of a wire, or release of the wire, relatively easily. Additionally, the construction and arrangement illustrated permits the release member to be located at all times wholly within the confines of the plane of the face plate 8 of the switch and the plane of the rear cover 12. Thus, the release means itself in no way encroaches upon the depth of the electric fitting.

Additionally, the release member may be located at a distance spaced sufficiently from the edge of the plaster depth box 6, that decorating materials (e.g. stiff wallpaper) which may inadvertently extend over the wall of the box, will not interfere with the release member, such as by causing movement thereof to reduce contact pressure between the contact member 16 and the conductive wire 18.

WHAT WE CLAIM IS:-

1. An electrical fitting of the kind specified, comprising an aperture in the housing into which a conductive wire of an insulated cable may be inserted in the establishment of conductive contact between the wire and a terminal of the fitting, wherein the fitting comprises, associated with said aperture, a contact member which is spring-urged into an operative position in which it is arranged so as in use to press against a conductive wire in the aperture to afford conductive contact between the wire and the terminal of the fitting, and to restrain the wire against being withdrawn from the aperture, the electrical fitting comprising a release member which is mounted for pivotal movement with respect to the housing and which comprises an operating portion located within the housing and an operated portion extending from the housing and which may be moved, by manual engagement of said operated portion, between an operative position in which the operating portion holds the contact member in an inoperative position in which a wire may be inserted into or withdrawn from the aperture, and an inoperative position in which the contact member adopts its operative position.

2. An electrical fitting according to claim 1 wherein the release member comprises a central part which is recessed or otherwise reduced in cross-section, which part is located in a slot provided in a side wall of the housing.

3. An electrical fitting according to claim 2 wherein the release member is retained in said slot by a rear cover of the housing.

4. An electrical fitting according to claim 3 wherein on manual operation the

release member bears against the rear cover and moves against the contact member to move said contact member against its resilience to its inoperative position, and upon release of the release member, the contact member is allowed to move to its operative position.

5. An electrical fitting according to any one of the preceding claims, in the form of an electric switch suitable for use in conjunction with a "plaster depth" box.

6. An electrical fitting according to any one of the preceding claims wherein the release member is located at all times wholly within the confines of the plane of the front plate of the switch and the plane of the rear of the housing.

7. An electrical fitting according to any one of the preceding claims wherein operation of the release member may be effected by pressing part of the release member towards the front plate.

8. An electrical fitting constructed and arranged substantially as hereinbefore described with reference to the accompanying drawings.

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Printed for Her Majesty's Stationery Office,
by Croydon Printing Company Limited, Croydon, Surrey, 1981.
Published by The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.



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10 Additionally, the release member may be located at a distance spaced sufficiently from the edge of the plaster depth box 6, that decorating materials (e.g. stiff wallpaper) which may inadvertently extend over the wall of the box, will not interfere with the release member, such as by causing movement thereof to reduce contact pressure between the contact member 16 and the conductive wire 18.
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55 2. An electrical fitting according to claim 1 wherein the release member comprises a central part which is recessed or otherwise reduced in cross-section, which part is located in a slot provided in a side wall of the housing.
60 3. An electrical fitting according to claim 2 wherein the release member is retained in said slot by a rear cover of the housing.
65 4. An electrical fitting according to claim 3 wherein on manual operation the

release member bears against the rear cover and moves against the contact member to move said contact member against its resilience to its inoperative position, and upon release of the release member, the contact member is allowed to move to its operative position.
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75 5. An electrical fitting according to any one of the preceding claims, in the form of an electric switch suitable for use in conjunction with a "plaster depth" box.
80 6. An electrical fitting according to any one of the preceding claims wherein the release member is located at all times wholly within the confines of the plane of the front plate of the switch and the plane of the rear of the housing.
85 7. An electrical fitting according to any one of the preceding claims wherein operation of the release member may be effected by pressing part of the release member towards the front plate.
90 8. An electrical fitting constructed and arranged substantially as hereinbefore described with reference to the accompanying drawings.
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