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Duchatellier

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[54] **ELECTRICAL CONNECTION CLIP**

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[52] **U.S. Cl.** ..... **339/244 R,** 339/258 S

[51] **Int. Cl.** **H01r 13/24**

[58] **Field of Search** 339/244, 256, 258

[56] **References Cited**

UNITED STATES PATENTS

3,183,471	5/1965	Burkert	339/258 RR
3,251,022	5/1966	Hammell	339/256 SP
3,273,102	9/1966	Cobaugh	339/258 S
3,452,324	6/1969	Fitzpatrick	339/256 SP
3,729,701	4/1973	Smith	339/258 S

FOREIGN PATENTS OR APPLICATIONS

990,001	4/1965	Great Britain	339/244 R

OTHER PUBLICATIONS

IBM Technical Disclosure Bulletin, Legge et al., Slip-On Electrical Connector, 1-1970, Vol 12, No. 8 p. 1199.

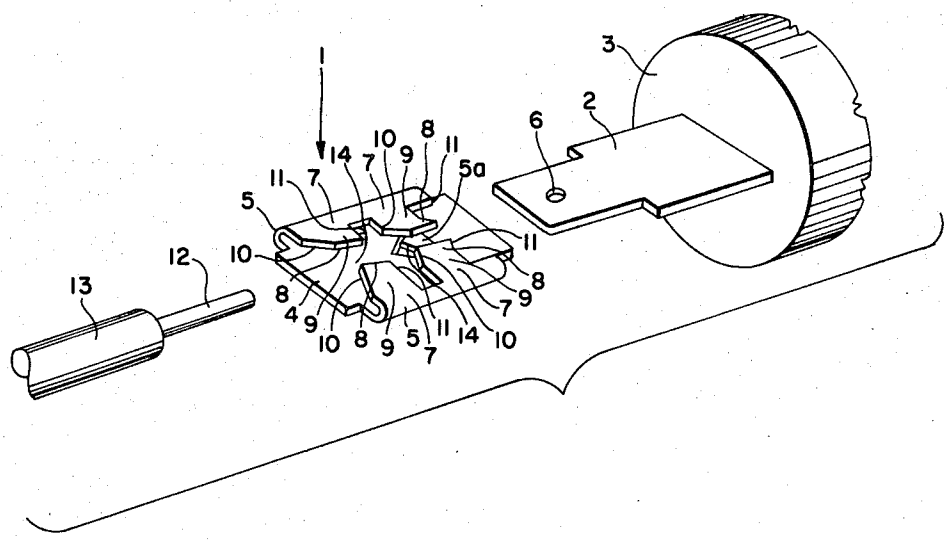
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[57] **ABSTRACT**

An electrical coupling device designed for instantaneous manual coupling of a conductor, such as an electrical conductor wire, to the conducting pin of an electrical apparatus of any type. The coupling has the general cross-sectional shape of a C whose body is approximately flat and has a lug protruding toward the inside of the C and whose wings are respectively constituted of a pair of small tongues which are sloped with respect to the base.

4 Claims, 4 Drawing Figures



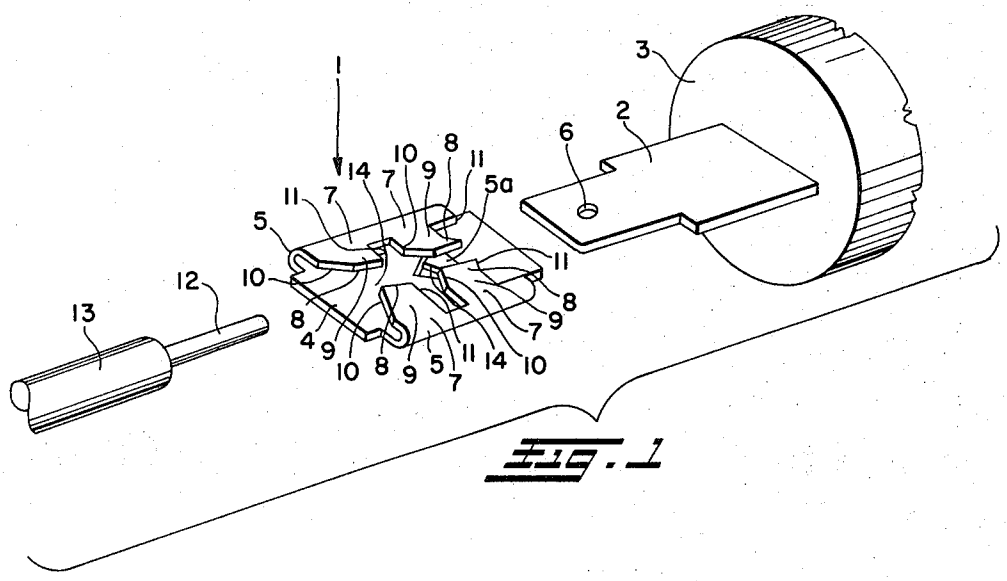


Fig. 1

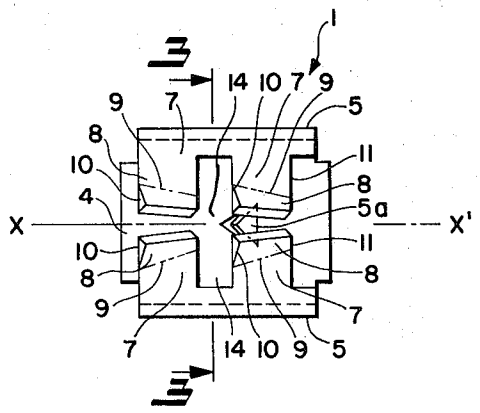


Fig. 2

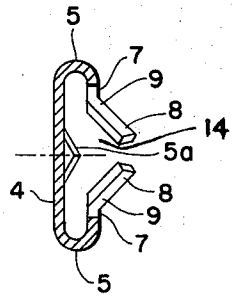


Fig. 3

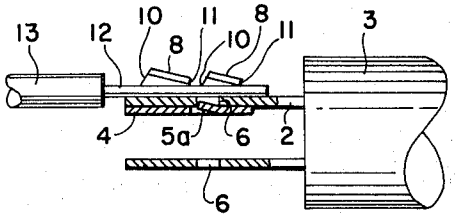


Fig. 4

ELECTRICAL CONNECTION CLIP

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an electrical coupling device for a fastenable terminal and more particularly, to an electrical connector intended for the instant manual electrical connection between a conductor and a conducting pin belonging to an electrical apparatus of any type.

2. Description of the Prior Art

Various types of electrical terminals, or electrical coupling devices, are known in the prior art which permit the connecting of an electrical conducting wire to a metallic element of an apparatus which must be supplied with electrical current. For example, it is known to use terminals comprising a flat washer prolonged by a small lug, the edges of the lug being capable of being folded against each other so as to make a setting, or mechanical grip, on the previously stripped conductor wire, and the washer being fastened by means of a screw to the metallic element of the device to be supplied with current. However, such terminal connectors have proven to be less than satisfactory as the electrical connection thus developed requires a plurality of parts and remains very fragile, especially if the devices provided with such terminals are subject to vibrations. Such terminals may actually loosen themselves, and more specifically, the conductor wire held in the lug of the terminal may have a tendency to escape from the latter when subject to vibration. In addition, connecting terminals of the type discussed above have proven to require a considerable time for assembly especially when an apparatus requires a plurality of electrical connections to be made to a plurality of conducting pins which are located closely together. Additionally, terminals used in the above-mentioned situation may tend to twist which can bring them into contact with each other creating a short circuit which may result in damage to the apparatus being supplied with current.

BRIEF SUMMARY OF THE INVENTION

In accordance with the present invention the drawbacks of the prior art have been overcome to the extent that a relatively simple and inexpensive electrical coupling device has been provided which will form an electrical connection which is very secure and permits the instant and manual connection of the conducting pin of an electrical apparatus to be supplied with current with an electrical conducting wire. It is understood that the term "manual" is intended to describe a mode of operation and that the coupling device of the present invention may, of course, be utilized in connection with a mechanized connection process. The connecting device of the present invention is preferably used with a connecting pin which is flat in shape but is also usable with connecting pins of any shape. To perform the electrical coupling operation it suffices to simply strip the end of the conductor wire and then, using the coupling device of the present invention, place the coupling device on the pin and then the stripped end of the wire into the coupling device.

The electrical coupling device of the present invention provides a coupling forming a fastenable terminal for a quick electrical junction between a conductor and a conducting pin of the type having a cross-sectionally

generally C-shaped form with wings which are close enough to the core of the C to be able to grip said pin against said conductor, the coupling device being characterized that the wings are partly folded back outward following an oblique line of folding to ensure the catching of the conductor in a position which will lock said conductor against the conducting pin.

According to another characteristic of the invention, the wings of the C each consist respectively of a pair of small tongues whose ends are folded back obliquely outward. The oblique fold of the small tongues is so made that one of the edges of the said tongues is raised to permit the insertion of the conductor and the opposite edge of said tongues is lowered to provide a biting edge to grip the conductor and prevent its removal from the coupling.

According to another characteristic of the present invention an embrasure, or space without material, whose width is approximately half of that of the conductor cited above is provided between the two wings. The embrasure is adapted to receive the conductor and will thus assist in placing the conductor on the center line of the conducting pin. The form of the C includes a lug protruding into the C for engagement in an opening made in the pin during the preliminary fastening of the coupling to the said pin. The lug is constituted of a small triangular strip cut out of the body of the C and bent in towards the inside of the body of the C. Thus, it may be seen that the coupling of the present invention is in firm contact with the pin, and that the electrical connection established after inserting the wire into the coupling is direct, that is, it is developed without passing current by means of the coupling, which advantageously eliminates successive or intermediate contacts which might cause heating which would be damaging to the proper behavior of the connection. Finally, it will be noted that the coupling of the present invention is effected by a mechanical gripping of the conductor to the pin, and that thus the foldings, crossings, intersections, and overlappings of the wire which were required with many of the prior art coupling devices are eliminated, which reduces the risk of a false contact and short-circuiting. All these advantages are essentially obtained due to the fact that a coupling according to the present invention remains relatively simple and compact.

Accordingly, it is an object of the present invention to provide a new and improved electrical coupling device.

A further object of the present invention is to provide a new and improved electrical coupling device designed for the instant manual electrical connection between a conductor and a conducting pin.

A further object of the present invention is to provide an economical and compact electrical connection device intended for the instant manual electric connection between a conductor and a conducting pin belonging to an electrical device of any type.

Other advantages and objects of the present invention will become more apparent from a reading of the following detailed description and reference to the attached drawings, which are given by way of example only.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing the coupling of the present invention between the stripped end of an

electrical conductor wire and the conducting pin of an electrical apparatus to be supplied with electrical current.

FIG. 2 is a plane view of the coupling of FIG. 1.

FIG. 3 is a cross-sectional view made along the line III—III of FIG. 2.

FIG. 4 is a view in elevation and partial section showing the coupling of the present invention mounted in position on one of the conducting pins of an electrical apparatus which is not shown.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The electrical coupling device 1 of the present invention has in cross-section the general shape of a C (see FIG. 3) and is formed in a metal strip or sheet having suitable elastic or spring characteristics. The coupling device 1 is so shaped that it will tightly envelop the flat piece or outlet pin 2 of an electrical apparatus 3 to be supplied with current when placed thereon.

The body 4 of the C is generally flat and includes a lug 5*a* consisting of a small triangular strip cut out and bent into the inside of the C. The lug 5*a* is advantageously connected during the preliminary fastening of the coupling 1 to the pin 2 of an opening 6 provided in the pin 2.

The flat body of the C is prolonged on each side by two approximately semi-circular bendings 5 which are respectively prolonged by two pairs of small tongues whose root 7 is approximately parallel to the flat body 4 of the C, and whose respective ends 8 are slightly folded upward following a certain incidence in relation to the longitudinal axis X—X' (see FIG. 2) as will be described in greater detail below. The bendings 5 and the tongues comprise the wings of the C.

The ends 8 of the tongues are folded back outward along a sloping line of fold as best seen in FIGS. 1 and 4, and more precisely, this sloping fold is made so as to raise the edges or ridges 10 of each tongue, and to lower the opposite edges or ridges 11 of the tongues, so that as we see better in FIG. 4, the ridges 11 bite the stripped end 12 of the electrical wire 13 after its insertion into the coupling between the pin 2 and the tongues, while the ridges 10 permit the easy introduction of the stripped end 12 into the coupling.

It has been established that the ridges 11 penetrate advantageously into the material constituting the end 12 of the wire 12 and thus oppose its withdrawal by traction. It is also noted that forces tending to extract the wire 13 cause the tongues to dig deeper into the wire 13 and the connection becomes more solid.

Finally, it will be noted that the embrasure or space without material 14 is provided between the two wings of C, the width of this embrasure being equal to about half of that of conductor wire. The embrasure 14 which is adapted to receive the conductor is centered with respect to the coupling device 1 and will thus aid in centering the conductor 13 with respect to the center line of conducting pin 2.

The assembly of the coupling 1 according to the present invention can be very easily inferred from the description which has just been given. Initially, the coupling device 1 is introduced by sliding it onto the pin 2 of the device to be supplied with electric current. The said coupling device 1 will lock itself to the pin 2 by means of the lug 5*a* penetrating the hole 6 in the pin 2. The stripped end 12 of the wire 13 is then introduced as by sliding it under the tongues of the coupling device 1, preferably to be received by embrasure 14. The coupling device 1 is then very solidly locked to the pin 2 and at the same time the stripped end 12 of the wire 13 is firmly pressed against the pin by the elasticity or springiness of the tongues. Finally, it should be noted, as has already been mentioned above, that the self-holding action of the tongues of the coupling is exerted with greater force as traction ending to pull the wire 13 from the coupling increases.

As is shown in FIG. 4, the stripped end 12 of the wire 13 is in direct contact with the prolongation of the pin 2, and is pressurized by the electrical coupling device 1 of the present invention to remain in direct contact therewith.

The terminal connector of the present invention thus provides a very compact electrical coupling which is economical to manufacture and is suited for the instant manual mechanical electrical connection between a conductor and a conducting pin of an electrical device. The electrical connection developed by utilizing the coupling device of the present invention provides a very secure electrical connection while offering a high resistance to forces tending to extract the wire from said connection.

Although this invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made by way of example and that numerous changes in the details of construction and combination and arrangement of the parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

I claim:

1. An electrical coupling device for establishing an electrical connection between a conductor and the conducting pin of an electrical apparatus, said coupling device comprising a body of generally cross-sectionally C shape, the wings of said C being close enough to the base of the C to retain said pin and said conductor in direct pressurized contact upon insertion of said pin and said conductor into said coupling device, said wings each comprising a pair of tongues which are inclined with respect to the base, each tongue having an end sloping outwardly from the base to aid insertion of said conductor and an opposed end sloping towards the base to provide a biting edge to resist removal of said conductor, said coupling device adapted to establish said electrical connection when said pin is inserted from the end of the coupling whereat the ends of the tongues are inclined toward the body and then the conductor is inserted between the wings and the pin from the end of the coupling whereat the ends of the tongues are inclined from the body.

2. The coupling device of claim 1 wherein the base of the C includes a lug protruding towards the wings, said lug designed to engage an opening provided in said pin upon insertion of said pin into said conductor.

3. The coupling device of claim 2 wherein said lug comprises a small triangular strip cut out of the base of the C and bent toward the wings.

4. The electrical coupling device of claim 2 wherein the embrasure between the wings of the C is generally aligned with the axis of the body of the C and is of a width approximately half that of the conductor.

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