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C. E. CARSON

2,143,645

ELECTRICAL CONNECTION

Filed Sept. 18, 1936

Fig. 1

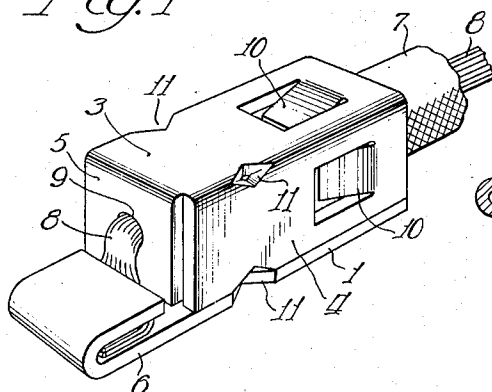


Fig. 2

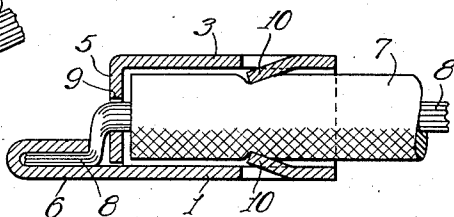


Fig. 3

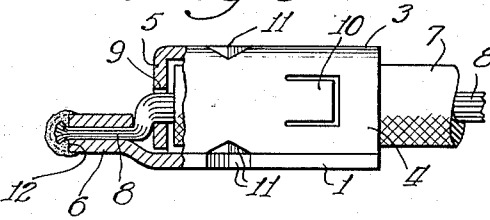


Fig. 4

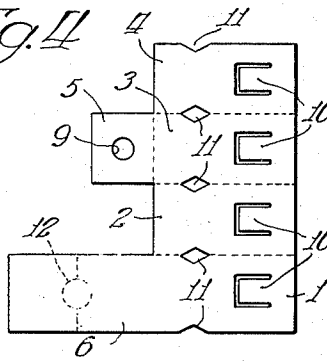


Fig. 6

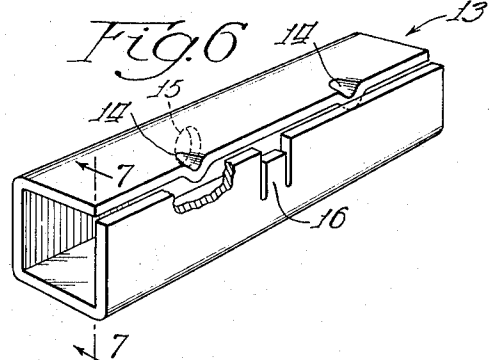


Fig. 5

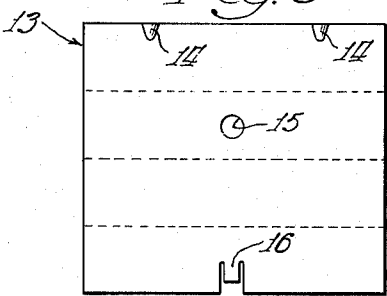


Fig. 8

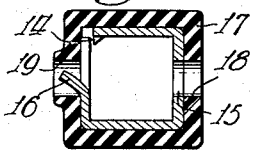


Fig. 9

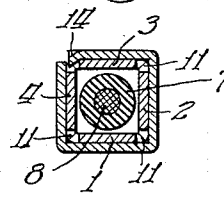
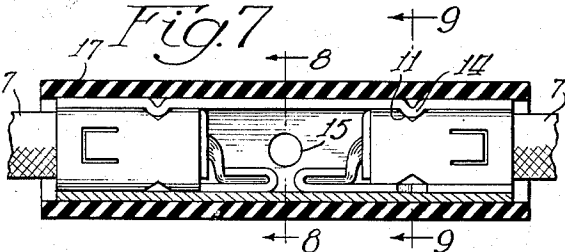


Fig. 7



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UNITED STATES PATENT OFFICE

2,143,645

ELECTRICAL CONNECTION

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Application September 18, 1936, Serial No. 101,361

3 Claims. (Cl. 173—328)

This invention relates to improvements in electrical connectors and more particularly to an improved terminal to be secured to the end of an electrical conductor or wire for the purpose of making an electrical connection between said wire and a socket or connecting means to complete the electrical connection to another wire or electrical device.

It is an object of this invention to provide a terminal of the character described that may be readily stamped from a sheet of metal and the blank so formed easily and readily shaped and attached, thereby reducing the cost of manufacture. It is a further object of this invention to so shape this improved terminal that when secured to the end of an electrical conductor it will provide a large contacting surface adapted to wipe over the socket or means which it engages thereby prolonging the life of the terminal, as it is self cleaning. It is another object of this invention to provide a terminal that is readily secured to the end of the electrical conductor with the connection to the bared strands of the conductor connected thereto by friction or solder and the insulated covering of the conductor engaged by a four point connection, whereby upon the flexing of the conductor the bared strands of wire secured to the terminal will be unaffected.

This improved terminal is of particular advantage for use in line connectors, in forming connections to industrial and automotive switches of the rotary, push and pull, as well as the toggle types, and to form connections to junction boxes, fuze blocks, and automotive and industrial lighting sockets.

With these and other objects in view reference is made to the accompanying sheet of drawings which illustrates a preferred form of this invention with the understanding that minor changes may be made without departing from the scope thereof.

In the drawing:

Figure 1 is a view in perspective of an embodiment of one form of this invention.

Figure 2 is a view in longitudinal, central, vertical section of Figure 1.

Figure 3 is a view similar to Figure 2 of a modified form of terminal.

Figure 4 is a plan view of the blank of metal from which this improved terminal is formed.

Figure 5 is a plan view of the blank of metal from which one form of connector or socket to be employed with this improved terminal is formed.

Figure 6 is a view in perspective of the form of

connector or socket formed from the blank shown in Figure 5.

Figure 7 is a longitudinal, vertical sectional view taken on the line 7—7, Figure 6, illustrating two of the improved terminals in elevation engaged within the connector shown in Figure 6 and the connector encased within an insulating covering.

Figure 8 is a view in transverse section taken on the line 8—8 of Figure 7.

Figure 9 is a view in transverse section taken on the line 9—9 of Figure 7.

This improved terminal is stamped from a sheet of thin resilient metal in the form shown in Figure 4 and then with the portion 1 as a base is folded over to form a rectangular housing square in cross section, as shown in Figure 1, with the top 3 projecting beyond the integral sides 2 and 4 bent downward at right angles to the base to form a perforated closure 5 with a portion 6 of the base 1, extending therebeyond. In applying this terminal to an electrical conductor, the covering 7 of insulation is stripped at one end to bare the wire or wires 8 and is inserted in the open end of the housing with the bare wires 8 passing through the opening 9 in the closure 5 and the end of the insulation 7 abutting the inner side thereof. The free end of the extension 6 of the base is then bent back upon itself to enclose and grip the ends of the wires 8, as shown in Figures 1 and 2. The tongues 10 on each side of the housing are then forced inwardly to grip the insulation 7 to resist the removal thereof from the housing. The openings 9 and the tongues 10 on the base 1 and sides 2, 3 and 4 as well as the indentations 11 on each edge of the housing and base are all formed when the blank is stamped from the metal.

There are instances when it is required that the electrical connection between the conductor and terminal be soldered. In adapting this terminal to such requirements the free end of the portion 6 of the base is provided with a circular opening 12, formed when the blank is stamped from the sheet of metal, as shown in dotted lines in Figure 4, and the end of the wires 8 pass therethrough as the end is bent back upon itself. In this form it is preferable to strike up the portion 6 from the base 1 as shown in Figure 3. After the portion 6 has been completely bent back upon itself a drop of solder is applied to the conductors 8 passing through the opening 12 and the body about said opening, as indicated in dotted lines in Figure 3.

In carrying out this invention and adapting this terminal to a connection, a resilient socket to snugly receive the terminal is necessary. Figures 6 to 9 inclusive illustrate a socket or connector of this character to provide a line connector. It is preferable to form this connector from a blank of proper dimensions struck from a sheet of the same metal as the terminal. It is preferable to stamp such a blank 13 in the shape illustrated in Figure 5. The blank is then folded upon itself to form a rectangular socket square in cross section, as shown in Figure 6.

One edge of the blank is provided with indentations 14 causing the body of the connector to protrude within the interior thereof opposite each indentation. These indentations are preferably arranged at a distance from the ends of the connector approximately the same as the distance between the open end of the housing of the terminal and the indentations 11 upon the edges thereof. The side of the connector next adjacent the indentations 14 is provided with a central circular opening 15 and the edge of the connector opposite the indentations is cut away to form a tongue 16, as shown in Figure 6. It is preferable to provide the socket or connector so formed with a surrounding sleeve or insulating material as shown at 17 in Figure 7. This sleeve may either be rectangular or cylindrical upon its exterior and is provided with a square passageway to receive the metallic socket or connector. The sleeve 17 is provided with circular openings 18 and 19 on opposite sides thereof so that when the connector is inserted therein a tool may be inserted through openings 18 and 19 to engage the tongue 16 and bend the same to cause its free end to enter into the opening 19, as shown in Figure 8, and thereby secure sleeve and connector to each other in proper relation. It is preferable to form a slight boss about the opening 19, as shown in Figure 8.

The metallic socket is formed so that the edges do not overlap and when the improved terminal is inserted within the connector, as shown in Figure 7, it will be snugly received therein with the four sides of the socket sliding over the four sides of the terminal. As the protuberance formed by the indentations 14 of the socket engages the square edge of the terminal it will resist the further entrance of the terminal but the connector being of thin metal and resilient the protuberance will wipe over the edge until it engages in the indentation 11 upon the terminal and will firmly hold the terminal within the connector and press the terminal against the near walls of the connector, as shown in Figure 9, and may be withdrawn therefrom when sufficient pulling force is exerted to cause the protuberance to wipe over the edge of the indentation 11 and edge of the terminal.

The terminal structure in so far as it relates to the cable attached thereto is claimed in the copending application No. 167,505, filed October 6, 1937.

Of course it is to be understood that terminals of various sizes are to be provided to receive electrical conductors of various types, and sockets

or connectors are to be provided for each size of terminal. Likewise, both terminal and connector are stamped from sheets of resilient metal and during the stamping the shape, perforations, indentations and cut out portions are stamped at the same time and the articles are formed by machinery from the blanks so produced. While the improved terminal is illustrated in connection with a connector to be employed as a line connector, it is not limited to this use alone. This terminal and socket or connector are adaptable to any use wherein a snap connection with a wiping self cleaning electrical contact is desired.

What I claim is:

1. An electrical connection including the combination of a metallic terminal square in cross section secured upon the end of an electrical conductor and a resilient metallic connector having an aperture square in cross section to slidably receive said terminal in either end, said terminal provided with four indentations, one on each longitudinal edge equally distant from the end thereof, and said connector having an inward protuberance adapted to wipe over an edge of the terminal and engage within an indentation thereon, whereby the engagement of any one of the four indentations upon the terminal with the inward protuberance upon the connector will lock the terminal in the connector.

2. An electrical connection including the combination of a metallic terminal square in cross section secured upon the end of an electrical conductor and a resilient metallic connector having an aperture square in cross section and having one longitudinal edge free, with each square corner edge of the terminal provided with a separate indentation equidistantly spaced apart from the end thereof to cooperate with said connector, and with the free edge of said connector provided with spring pressed protuberances to wipe over a square edge of said terminal and cooperate with one of said indentations thereon to firmly but detachably secure the terminal and connector to each other, irrespective of the end within which the terminal is inserted, and each protuberance being of such dimensions as to cause the sides of the terminal to firmly engage the sides of the connector, whereby the engagement of any one of the four indentations upon the terminal with the inward protuberance upon the connector will lock the terminal in the connector.

3. The structure of claim 1, wherein the connector is provided with a covering sleeve of insulating material provided with aligned apertures through opposite sides thereof, and wherein the longitudinal side of the connector adjacent said protuberance is provided with a cut-out integral tongue and the side opposite the tongue is provided with an aperture registering with an aligned aperture in the insulating sleeve, whereby a tool may be inserted through said registering apertures to force said tongue to engage the adjacent aperture in said sleeve to retain the sleeve upon the connector.

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