A cable connector and switch for connecting the ends of two round cables as a rotary switch in which identical halves comprising threaded body portions with mating threaded caps are provided with rigid conductors terminating at their outer ends in a point for insertion into the conductive portion of cables and making contact with the insulated conductors within cables. The caps are threadably engaged with the connector portions forcibly contracting restraining fingers onto the cables being connected. The switch halves terminate in mating protuberances and recesses comprising the switch connectors, a portion of the recess being conductively coated for making electrical contact at one extreme of rotation and breaking electrical contact at the other extreme of rotation.

5 Claims, 11 Drawing Figures
CABLE CONNECTOR AND SWITCH

BRIEF DESCRIPTION OF THE INVENTION

The present invention relates to an electrical cable connector and switch and more particularly to an electrical cable connector and switch which can be coupled in the line of any insulated cable without removal of any insulation therefrom.

According to the invention, an electrical cable connector and switch is provided which, in the case of a two-conductor cable, has a pair of conductive prongs extending from each end thereof. The cable is cut with the insulation and conductors extending to the edge thereof resulting in a termination plane or surface. The prongs are then inserted into the conductors within the cable and the ends of the cable pushed into each mating half of the switch and connective device. Each half contains a threaded cap which is first placed over the end of the cable to be connected and then, after the insertion of the conductive prongs, threadably engaged with mating sections of the connective switch portions. As the cap is tightened, fingers of a restraining insert are constricted to mechanically contact and retain the ends of the cable. The two rotating halves of the connective switch are then in electrical and mechanical contact with the ends of the cable being connected as a switch. Each of the mating halves of the switch contain an arcuate recess for the reception of a protuberance which is conductively coupled to one of the conductors. The bottom of the recess has a conductive portion which effects a contact with the protuberance when the mating halves are rotated to one extreme with respect to each other, and will effect an open circuit when rotated to an extreme in the opposite direction with respect to each other. A connecting link in the center of the two halves rotatably couples the two halves together in a press fit. Hence, an electrical connector and switch is provided which can be effectively utilized with a variety of cable sizes and shapes and requires no removal or insulation from the cable to be connected, as well as no soldering.

An object of the present invention is the provision of an improved electrical cable switch and connector.

Another object of the invention is the provision of an electrical cable switch and connector which does not utilize solder.

A further object of the invention is the provision of an electrical cable switch and connector which requires no removal of insulation.

Still another object of the invention is the provision of an electrical cable switch and connector which can be utilized with a variety of sizes and shape of electrical cable.

A still further object of the invention is the provision of an electrical switch and connector which is inexpensive to manufacture and extremely convenient in use.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIG. 1 is an exploded view of the preferred embodiment of the present invention;

FIG. 2 is a perspective view partially connected of the embodiment of FIG. 1;

FIG. 3 is a perspective view of the assembled embodiment of FIG. 1;

FIG. 4 is a side elevation in section of the embodiment of FIG. 1;

FIG. 5 illustrates the connective portion of the embodiment of FIG. 1 applied to a round electrical cable;

FIG. 6 illustrates the connective portion of the embodiment of FIG. 1 as applied to a flat electrical cable;

FIG. 7 illustrates in perspective a restraining insert of the preferred embodiment of the present invention;

FIG. 8 illustrates in a perspective exploded view the switch portions of the embodiment of FIG. 1 in one position;

FIG. 9 illustrates in perspective the switch portion of the embodiment of FIG. 1 in another position;

FIG. 10 illustrates a switch portion of the embodiment of FIG. 1 in detail; and

FIG. 11 is a schematic representation showing the switch portion of the embodiment of FIG. 1 in various positions.

DETAILED DESCRIPTION OF THE DRAWING

Referring to FIGS. 1, 2 and 3, the preferred embodiment of the invention is shown generally at 11 in various stages of connection. The switch connector 11 consists of identical parts 12 and 13 which are threadably engaged with caps 19 and 21, respectively, around cables 22 and 23. Prongs 14 and 16 and 17 and 18 fit into the conductors of cables 22 and 23, respectively, making electrical connection therewith.

Referring to FIG. 4, a sectional view of the upper portion of the connector 11 is shown with mating halves 12 and 13 and conductor prongs 14 and 16, and 17 and 18, emerging from parts 12 and 13, respectively. A connecting link 24 is shown pressfit within mating cavities of parts 12 and 13, rotatably coupling parts 12 and 13 together. Any suitable type of linkage can be utilized. Restraining insert 26 is shown within cap 19. Protuberance 27 is received by arcuate cavity 28. Protuberance 27 contains prong 14 which terminates in a conductive coating at 29 cooperating with conductive coating 31 at the bottom of cavity 38. Conductive prong 17 is electrically connected to coating 31. Protuberance 33 containing conductive prong 18 is received by arcuate cavity 32, terminating in a conductive portion coating 34 which communicates with conductive prong 36. Conductive prong 18 terminates in a conductive coating 36, conical recesses 35 increase at leakage paths between prongs 14 and 16 and prongs 17 and 18. The conical shape also provides for an abutting release with any size cable.

Referring to FIG. 5, the upper portion 12 of connector 11 is shown with a round cable 22 inserted within cap 19. Prongs 14 and 16 are in communication with conductors 37 and 38 of cable 22. Restraining insert 26 is shown constricted toward cable 22 and making an indentation therein for mechanically restraining cable 22 within cap 19.

Referring to FIG. 6, the upper half 12 of the invention is again shown with a flat cable 39 being received by cap 19 and having a conductor 41 which is in contact with prong 14. Here it can be seen that restraining insert 26 is further forced by cap 19 into flat cable 39.

Referring to FIG. 7, restraining insert 26 is shown having a ring 42 with construction fingers 43, 44 and 46 extending therefrom.
Referring to FIGS. 8 and 9, exploded views of one of the contacts are shown in a closed position (FIG. 8) and in an open position (FIG. 9). Extension 27 of upper member 12 terminates in a conductive coating 29 and has a slotted extension 30 on one edge thereof. Arcuate cavity 28 terminates in a conductive coating 32 on one end thereof. Protuberance 33 from member 13 terminates in a conductive coating at 36 and has a slotted extension 35 on one edge thereof. Cavity 32 of member 12 terminates in a conductive portion 34 at one end thereof.

Referring to FIG. 10, a detail of the connective portion is shown with conductive portion 31 in cavity 28 and conductive portion 29 of protuberance 27 being in an open position, i.e., the position indicated by FIG. 8. A snap extension 47 cooperates with portion 30 of protuberance 27 to insure a fully opened or closed position of the switch.

Referring to FIG. 11, a schematic diagram is shown indicating protuberance 37 with portion 30 in between the closed and open position. Moving toward the top of the diagram in dotted lines, protuberance 27 is shown as protuberance 27A indicating a conductive connection with conductive coating 31 in cavity 28. At the lower portion of the figure protuberance 27 is shown in dotted lines as 27B indicating the open position of the switch.

INSTALLATION AND OPERATION

Referring now to all the figures, it can be seen that once the parts 11 and 12 are assembled and it is desired to place them in a series with a two-conductor electrical cable, it is merely necessary to cut the cable at the desired location of the switch and connector, exposing two flat ends as shown in FIG. 2. Caps 19 and 21 are then slipped over each exposed end and the prongs inserted into the exposed conductors in the two ends of the cables. Caps 19 and 21 are then slipped over each exposed end and the prongs inserted into the exposed conductors in the two ends of the cables. Caps 19 and 21 are then threadably engaged with parts 11 and 12 until restraining inserts 26 have effected a closure around the two ends of the cables, securing them mechanically. At this point the installation is complete and portions 12 and 13 can be rotated with respect to one another to effect an opening or closing of electrical contact in both conductors of the severed cable.

It should be understood, of course, that the foregoing disclosure relates to only a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A cable connector and switch connecting the ends of two electrical cables comprising:
   a first and second identical body portions having first and second conductive prongs imbedded therein;
   a recess in an opposite end of each of said first and second body portions;
   a protuberance in each of said opposite ends, said recesses being dimensioned for receiving said protuberances and arcuate in shape for allowing said first and second body portions to be rotated with respect to each other;
   a conductive coating on the end of said protuberances; and
   a conductive coating on a portion of said recesses.

2. A cable connector and switch of claim 1 wherein:
   said prongs extending beyond one end of each of said first and second body portions for insertion into connectors of a cable to be connected.

3. The cable connector and switch of claim 2 wherein:
   said prongs extend from conical cavities.

4. The cable connector and switch of claim 1 and further including:
   a snap extension disposed on the bottom of said cavities for restraining said protuberances at each extreme of rotation.

5. The cable connector and switch of claim 1 and further including:
   first and second caps threadably engaged with said first and second body portions; and
   restraining inserts disposed within said first and second restraining inserts having constriction fingers for restraining contact with an end of a cable to be connected.

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