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(54) **Control wire terminal for wire clamp terminals**

(57) An auxiliary wire terminal (10) for removable placement in an electrical terminal cable clamp (22), constructed of an electrically conductive material that is shaped at its outward end (18) to mate with a connector on an auxiliary wire. The back section (12) of the auxiliary terminal (10) is positioned behind the terminal clamp (32) and extends at right angles under the clamp (32) and electrical cable (28) so that its flat surface (14) rests on the cable clamp electrical terminal (24) under the cable (28). The auxiliary connector end (16) extends out of the cable clamp cable insertion opening. The auxiliary connector end extending out of the cable insertion opening is bent at an angle approximately 20° relative to the bottom surface of the cable clamp terminal (24) to clear the cable (28). Clamping the cable (28) also clamps the auxiliary wire terminal (10) onto the main terminal (24).

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Description**BACKGROUND OF THE INVENTION**Field of the Invention

[0001] This invention relates generally to terminal cable clamps and more particularly, to terminal cable clamps with auxiliary wire connections.

Background Information

[0002] There is a need at certain cable clamp terminals to provide auxiliary wire connections for control, monitoring, or other auxiliary purposes. Currently these control wire connections are fastened to the cable clamp terminal by a mechanical fastener, such as a screw. In some designs, the screw attachment is not convenient.

[0003] Accordingly, there is a need for an improved auxiliary wire connection that can accommodate most cable clamp terminal designs.

[0004] In addition, there is a need for an improved auxiliary wire connection that can be removably connected to a cable clamp without modifying the clamp design.

[0005] Furthermore, an improved auxiliary wire connection is desired that can accommodate a variety of wire connector designs.

SUMMARY OF THE INVENTION

[0006] These and other objects are satisfied by an improved auxiliary wire terminal of this invention for removable placement in an electrical terminal cable clamp having an opening for inserting the electrical cable. The auxiliary terminal is formed from a flat elongated member constructed from an electrically conductive material having a plurality of sections along its extended length. At least one group of adjacent sections of the auxiliary terminal, starting at one end, has the section formed at right angles to each other, with the section adjacent the one at the one end extending a distance that will traverse the clamp and the opening. The other end of the elongated member terminates in an auxiliary terminal shape that is adapted to connect with an auxiliary wire connector.

[0007] In the preferred embodiment, the other end, that includes an end section carrying the auxiliary terminal shape, is bent at an angle to the section traversing the clamp, in a direction that will provide some clearance between the electrical cable and the auxiliary terminal shape. Preferably the angle is 20° from a line parallel to the terminal surface that the cable is clamped to.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] These and other objects of the present invention will be disclosed in conjunction with the detailed description and accompanying drawings in which like numerals represent like elements and in which:

Figure 1 is a top plane view of the auxiliary wire terminal of this invention;

Figure 2 is a side view of the auxiliary wire terminal of this invention; and

Figure 3 is a side view partially in section of a terminal clamp incorporating the auxiliary wire terminal of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] In some applications it is desirable to connect an auxiliary wire to a cable clamp, for example, on a circuit interrupter, e.g., for control, monitoring, and sensing circuit properties. Since it is not always required, and in some instances may create interference, it is preferable that the auxiliary terminal to which the wire is connected be removable, preferably without altering the main terminal. The auxiliary wire terminal of this invention provides an easily connectable and removable auxiliary terminal without modification of the basic terminal clamp.

[0010] A top plane view of the terminal of this invention is illustrated in Figure 1 with a side view shown in Figure 2. The auxiliary terminal is formed from a flat, electrically conductive material, such as copper, with a vertical section 12 bent at right angles to a horizontal section 14 which forms the clamp surface that holds the auxiliary terminal in place. Preferably, section 16 has a reduced width compared to section 14 and is formed on the opposite side of section 14 from the vertical section 12. Section 16 is intended to extend outside the opening of the cable clamp into which the cable is inserted. Section 16 includes an additional section at its end having a further narrowed width that is shaped to mate with the corresponding connector on the auxiliary wire to which it is to be attached. This section 18 also includes a hole 20 to which a clamp and screw can be anchored to clamp the auxiliary wire if desired. The end of section 16 is shaped so that it can mate with a corresponding clip or other connector on the auxiliary wire, chosen by the user.

[0011] Figure 3 illustrates a terminal cable clamp incorporating the auxiliary wire terminal of this invention. The terminal cable clamp is generally shown by reference character 22 and includes a housing section 30 and electrical terminal 24 that extends from the cable opening 34 to the rear of the clamp housing 30 where it continues at a right angle along the wall of the housing. The stripped down section 26 of cable 28 is inserted through the opening 34 and rests against the horizontal

portion of the terminal 24. A clamping screw 32 is secured within a threaded portion of the housing 30 and clamps the cable in electrical communication with the horizontal portion of the electrical terminal 24. The auxiliary terminal 10 of this invention is anchored in place with the cable clamp. The back section 12 is positioned behind the terminal clamping screw 32. The clamped auxiliary terminal surface 14 rests on the cable clamp electrical terminal 24. The connector end 18 protrudes out of the cable clamp terminal opening 34. The connector section 16 is bent at an angle approximately 20° below the bottom surface of the terminal 24 to clear the cable 28. Clamping the cable 28 along its stripped section 26 also clamps the auxiliary wire connector surface 14 onto the terminal 24. Thus, this invention provides a convenient and efficient way of adding an auxiliary terminal to a cable clamp.

[0012] While specific embodiments of the invention have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of invention which is to be given the full breadth of the claims appended and any and all equivalents thereof.

REFERENCE CHARACTER LIST

[0013]

- 10. The auxiliary terminal.
- 12. The vertical section of the auxiliary terminal.
- 14. The horizontal clamp section of the auxiliary terminal.
- 16. The section of the auxiliary terminal extending out of the cable clamp opening.
- 18. The auxiliary wire connector form.
- 20. The clamping screw hole.
- 22. The cable clamp.
- 24. The cable clamp terminal.
- 26. The stripped section of the cable.
- 28. The cable.
- 30. The cable clamp housing.
- 32. The cable clamping screw.
- 34. The cable insertion opening in the cable clamp.

Claims

1. An auxiliary wire terminal (10) for removable placement in an electrical terminal cable clamp (22) having an opening for inserting an electrical cable (28) comprising:

a flat elongated member (10) formed from an electrically conductive material and having a plurality of sections (12,14,16) along its extended length with at least one set of adja-

cent sections (12, 14) starting at one end having the sections formed at right angles to each other, with the section (14) adjacent the one (12) at the one end extending a distance that will traverse the clamp (22) and clear the opening, with the other end (16) of the elongated member terminating in an auxiliary terminal shape (18).

- 2. The auxiliary wire terminal (10) of claim 1 wherein the length of the section (12) at the one end is less than or equal to the height of the opening.
- 3. The auxiliary wire terminal (10) of claim 2 wherein the length of the section (12) at the one end is less than or equal to the clearance under the cable clamp (32) when the clamp is substantially in the full open position.
- 4. The auxiliary wire terminal (10) of claim 1 wherein the auxiliary terminal shape (18) is a necked-down region that can slip into a sleeve connector on the auxiliary wire.
- 5. The auxiliary wire terminal (10) of claim 1 wherein the auxiliary terminal shape (18) includes a screw hole (20) that a screw or other fastener can be secured in to clamp the auxiliary wire.
- 6. The auxiliary wire terminal of claim 1 wherein the other end includes an end section (16) including the auxiliary terminal shape (18), the end section (16) being bent at an angle to the section (14) traversing the clamp in a direction that will provide some clearance between the electrical cable (28) and the auxiliary terminal shape (18).
- 7. The auxiliary wire terminal (10) of claim 6 wherein the angle is approximately 20°.
- 8. A method of creating an auxiliary terminal (10) in an electrical terminal clamp (22) having an opening for inserting an electrical cable (28) comprising:
 - inserting a flat elongated member (10) formed from an electrically conductive material and having a plurality of sections (12,14,16) along its extended length with at least one set of adjacent sections (12, 14) starting at one end having the sections formed at right angles to each other, with the section (14) adjacent the one (12) at the one end extending a distance that will traverse the clamp (22) and clear the opening, with the other end (16) of the elongated member terminating in an auxiliary terminal shape (18), and wherein the one end is parallel to the clamp (32) and the adjacent section seats below the cable (28) and is fastened in

position when the clamp (32) is closed on the cable (28);
inserting the cable (28) into the clamp (22); and
closing the clamp (32).

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