United States Patent

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[54] COMBINATION MULTIPLE WIRE TERMINATION BLOCK AND WIRE STRIPPER

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[73] Assignee: **Avco Corporation**, Huntsville, Ala.

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[52] **U.S. Cl.** .....**339/98**, 81/9.5 C, 339/274

[51] **Int. Cl.**.....**H01r 9/08**

[58] **Field of Search** .....339/95, 97–99, 339/274; 81/9.5 C; 30/90.1

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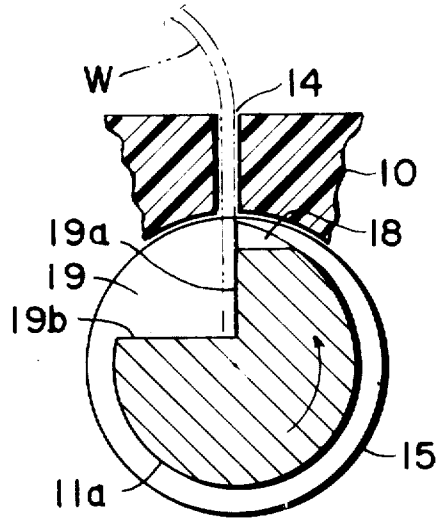
Primary Examiner—Joseph H. McGlynn

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[57] **ABSTRACT**

The invention is a combination multiple wire termination block and wire stripper for use in electrical systems requiring a plurality of common connection points. A supporting body or block containing a rotatable metal shaft is secured to a chassis or other convenient support and the insulated wires to be connected are simply inserted in appropriate holes therein and the shaft rotated a fraction of a revolution to partially strip the wires and simultaneously force the bare ends between the internal sides of the block and the shaft, thereby making a common electrical connection. Counterrotation effects a disconnection.

4 Claims, 6 Drawing Figures



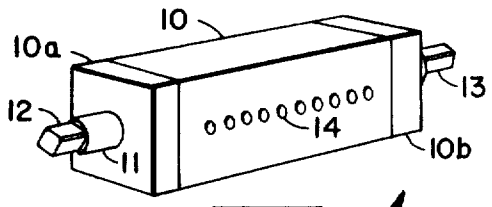


Fig 1

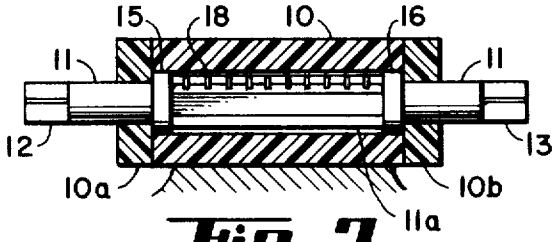


Fig 2

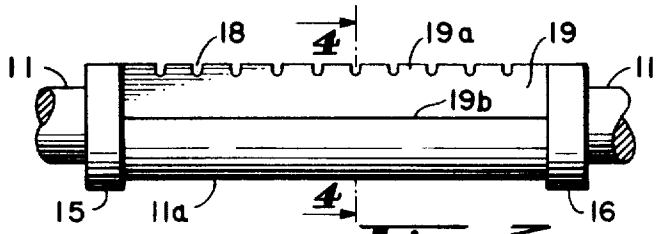


Fig 3

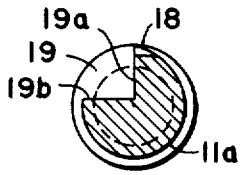


Fig 4

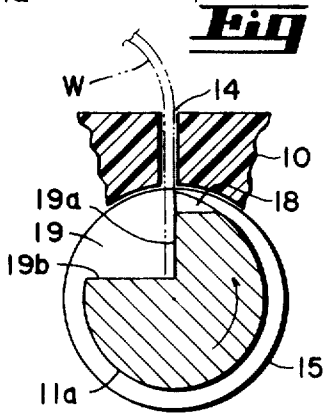


Fig 5

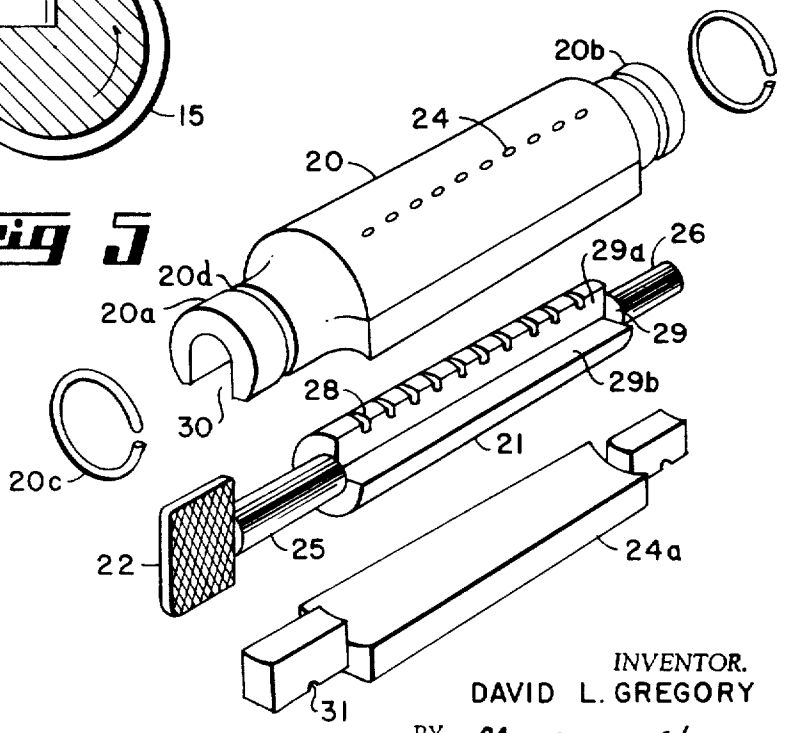


Fig 6

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COMBINATION MULTIPLE WIRE TERMINATION BLOCK AND WIRE STRIPPER

SUMMARY

The invention relates to the art of electrically connecting a number of lead wires to a common terminal in complex electrical systems such as telephone exchanges or computer systems. Where it is required to connect a large number of such leads to such a terminal, a technician must ordinarily first strip the insulation from the end of each lead and laboriously connect, by soldering or otherwise, each bared wire to the terminal or to a buss strip integral therewith. The invention provides a device which is sufficiently simple and inexpensive that it may be attached to and made a permanent part of the support or chassis upon which the components of the system are affixed. The device enables the leads to be stripped and simultaneously connected to the common terminal by a simple mechanical manipulation and likewise permits disconnecting the leads from the terminal by a reversal of such manipulation.

A major object of the invention is to provide a simple, inexpensive, efficient and practical assembly, which to some extent may be regarded as a tool, by which a plurality of insulated wire leads may be stripped simultaneously and quickly connected to a common terminal.

The prior art teaches the construction and operation of a number of efficient wire strippers and connecting devices, usually constructed as separate tools. Such tools are manipulated by a technician from a position removed from the electrical assembly in which connections are to be made. When completed, such tool (or tools) does not become a part of the assembly but is put back in the technician's tool box for future use. A subsidiary object of the invention is to provide a tool which is sufficiently simple and inexpensive that it may be permanently attached to the assembly and yet be reusable at that point for effecting a disconnection of the leads from the terminal or rewiring the circuit with one or more new leads and for reconnecting the same or a replacement series of wires.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the invention will appear when reference is had to the following specification and accompanying drawings, in which

FIG. 1 is a perspective view of an illustrative device constructed in accordance with the invention;

FIG. 2 is a longitudinal cross-section taken through the center of the device with slots on the periphery of the internal rotatable shaft shown in one position;

FIG. 3 is a front view, in elevation, of the rotatable shaft alone with parts cut away and with the same turned to position 90° from that shown in FIG. 2, with the slots shown in another position;

FIG. 4 is a section taken along line 4 — 4 of FIG. 3;

FIG. 5 is an enlarged section similar to FIG. 4 with the shaft rotated 90° from the position shown in FIG. 4 with one wire shown in phantom lines and with part of the shaft-enclosing body illustrated, and

FIG. 6 is an exploded view of an alternative embodiment.

DETAILED DESCRIPTION

Referring to FIG. 1, an illustrative device is shown in perspective as consisting of a support or block housing **10** which may be conveniently made of thermosetting plastic insulating material having dielectric properties, through which is extended a metal shaft **11** of brass or nickel-plated material partially journalled in end blocks **10***a* and **10***b*, which are secured to blocks **10** by any convenient means.

The block **10** is secured to the chassis containing the related electrical equipment or to another convenient support, as shown in FIG. **2**, so that torque applied to the shaft will not move the block. The block is bored or moulded to provide a cylindrical cavity or chamber for receiving shaft **11**, the bore being slightly larger than the shaft to provide a slight clearance so that the shaft may rotate freely therein.

On one side of block **10** and extending therethrough are a plurality of spaced holes or ports bored to the overall diameter of the wires to be stripped and connected. The ends of these wires W are extended through these holes until they abut against an internal wall **19***b* of the shaft as shown in phantom lines in FIG. **5** and as will hereinafter be more particularly described.

In FIG. **2** is shown in longitudinal cross-section how shaft **11** extends through block **10** and is rotatable therein, for instance, by turning the squared ends **12** or **13**. After extending through end blocks **10***a* and **10***b* shaft **11** comprises a cylinder **11***a* with enlarged cylindrical bearing portions **15** and **16** journalled at the end of the shaft-receiving cavity. Cylinder **11***a* has a quadrant-shaped cut-out portion **19** as shown more clearly in FIGS. **3**, **4** and **5**. Extending laterally from one face **19***a* of the cut-out are a plurality of grooves **18** of such size as to receive the ends of wires W when inserted through holes **14** in block **10**, the holes being aligned with such grooves when the shaft is in operative position. One such groove, with one wire W extending therethrough until it is in abutment with the other face **19***b* of cut-out **19**, is shown in detail in FIG. **5**. The size of the grooves is determined so that the ends of the wires, with insulated covering thereon, will be compressed and fit snugly therein when the shaft is turned, as will now be described.

The device is operated by inserting from one to 10 (in the illustrative embodiment of FIGS. **1** to **5**) unprepared insulated wires into the array of holes **14** until the ends abut the face **19***b* and then turning the shaft 90° by the use of a suitable tool at end **12** or **13**. As the shaft is turned in the direction of the arrow in FIG. **5**, the wires are squeezed into grooves **18** and gripped. As the rotation continues, the insulation is penetrated by the peripheries of grooves **18**, the wires partially stripped, and the bared wires simultaneously forced between the sides of the cavity and the internal metal shaft, thereby making a common electrical connection. Since the wires are jammed in the space between the shaft and the block, the technician will feel a substantial reaction and will know that the device is operating properly. To remove the wires, the process is reversed and the shaft turned 90° in the opposite direction, after which the wires can be easily removed.

An alternative device is shown in FIG. **6** comprising an integral plastic stamping such as one made of a phenolic condensation product **20** having a longitudinal entrance opening (not shown) through which may be inserted a shaft **21** in a direction at right angles to the longitudinal axis of the body of the stamping **20**. At the ends of the stamping are extensions **20***a* and **20***b* having aligned slots **30** adapted to receive and form a bearing for the journal sections **25** and **26** of the shaft **21**. The shaft **21** is provided with quadrantial cut-out **29** having axial faces **29***a* and **29***b* in one of which are provided slots **28** similar to the slots **18** in the first embodiment, which are aligned with the longitudinally spaced openings **24** in the body **20**.

After the shaft **21** is inserted in the body **20** a block **24***a* is fitted into the entrance opening previously noted and O-ring clamps **20***c* are placed in grooves **20***d* in the extensions **20***a* and **20***b*.

For convenience in operation, a knurled thumb crank or nut **22** is integrally formed at the end of shaft **21** so that the shaft may be turned to strip the wires and connect them into a common electric connection as above described.

In the embodiments shown, small pieces of insulation or device has been used a certain number of times, but this will have no deleterious effect on the operation until the quadrant is filled. Should any installation require continuous connection and disconnection, the end faces **10***a* and **10***b* in the first embodiment and the plug **24***a* in the second, are removable, thereby making it possible to clear away such debris.

What I claim is:

1. A multiple wire termination block and wire stripper comprising, in combination:

a supporting body,

said body being formed with an interior cylindrical cavity,

and a metal shaft rotatable in said cavity,

said body being further formed with a plurality of holes extending radially towards said shaft,

said shaft being formed with a quadrant-shaped cut-out and slots adjacent thereto and cut in the periphery of the cylindrical surface of said shaft,

said slots being aligned with said holes and constituting means for gripping the ends of insulated wires inserted in said holes,

said shaft having formations for turning it so that the wires are partially stripped and simultaneously electrically forced into intimate connection with said shaft.

2. The combination as claimed in claim 1 in which the body is constructed of a thermosetting resin having dielectric properties.

3. The combination as claimed in claim 1 in which the body has removable ends in which the shaft is journalled.

4. A multiple wire termination block and stripper comprising, in combination:

a housing formed to provide end journals and an intermediate cylindrical chamber,

a metal shaft having a body portion formed for rotation within said cylindrical chamber and end portions projecting through said journals,

said housing being formed with spaced ports adapted to receive the ends of wires and extending in a direction generally normal to said shaft,

said shaft being formed with a cut-out portion providing an abutment face against which said wires terminate when the shaft is in wire-receiving position and an additional face then upstanding and parallel to the wires, together with slots in alignment with said ports extending transversely of the upstanding face and on the outer surface of said body, the spacing between said slots and the wall of said chamber being so proportioned that, when the shaft is turned in a direction to bend the wire ends, the wire ends are partially stripped and electrically formed into firm contact with said shaft.

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