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C. H. JASPER
PROCESS AND DEVICE FOR JOINING, FINISHING, AND FINAL
INSULATING WIRE TERMINALS OF ELECTRICAL CONDUCTORS
Filed June 23, 1921

Fig. 1.

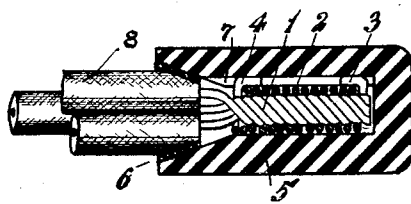


Fig. 2.

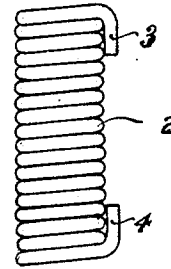


Fig. 3.

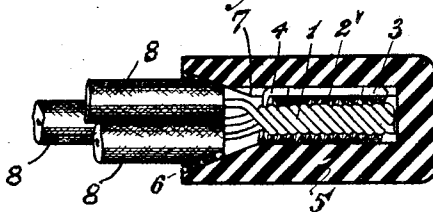


Fig. 4.

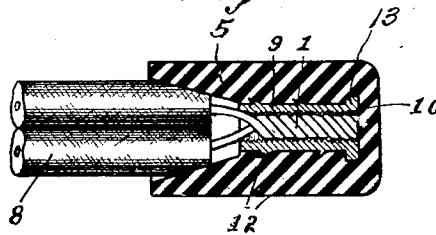


Fig. 5.

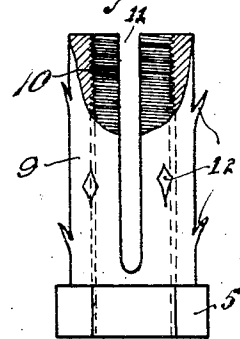


Fig. 6.

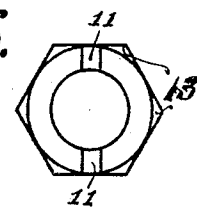
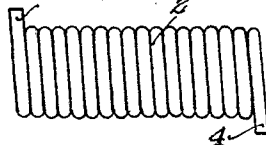


Fig. 2a.



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UNITED STATES PATENT OFFICE.

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PROCESS AND DEVICE FOR JOINING, FINISHING, AND FINAL INSULATING WIRE TER-
 MINALS OF ELECTRICAL CONDUCTORS.

Application filed June 23, 1921, Serial No. 479,949, and in the Netherlands June 5, 1920.

The invention relates to a process and to means for joining electrical conductors, particularly at their ends, and is illustrated, by way of example, in the accompanying drawings, in which:—

Fig. 1 is a longitudinal sectional view of a joint constructed according to the invention.

Fig. 2 shows the helically wound wire sleeve in elevation and on an enlarged scale.

Fig. 2^a is a view similar to Fig. 2 showing a modified form of wire sleeve.

Fig. 3 is a view similar to Fig. 1 showing a helical wire sleeve of triangular cross-section.

Fig. 4 is a view similar to Fig. 1 showing a modification in which a metal sleeve is used in place of a helical wire.

Figs. 5 and 6 are an elevation and an end view, respectively, of the sleeve shown in Fig. 4 and on an enlarged scale.

In carrying out my invention the bared ends of the conductors are twisted together into a terminal 1 of uniform cross-section to which solder may be applied if desired.

According to the form of the invention illustrated in Figs. 1 and 3, a helical wound wire sleeve 2 is inserted in a cap 5 of hard rubber or of any other suitable insulating material, said cap having its open end portion formed with a conical interior surface. The ends 3 and 4 of the wire sleeve 2 may be bent over upon the sleeve to extend parallel to its axis, as illustrated in Figure 2, or may extend at right angles to the axis of the sleeve, as illustrated in Figure 2^a. In either case, when the sleeve is inserted in said cap, the ends 3 and 4 slide in a groove 7 as illustrated in Figs. 1 and 3, or in grooves, arranged opposite each other in the insulating cap 5, if the ends of the wire sleeve extend on both sides of the wire sleeve, as illustrated in Fig. 2^a. The ends 3 and 4 of the sleeve cooperate with the walls of said groove or grooves to prevent the sleeve from turning in the cap. The cap, with the wire sleeve inserted therein, is now screwed on to the twisted terminal 1 in the same manner as a nut is screwed on to the threaded end of a bolt. The metal of which the wire sleeve is made should be harder than that of the conductor wires so as to enable the wire sleeve to cut a

thread in the twisted terminal 1 when the cap is screwed thereon. It will be evident, that for this purpose, the individual turns of the wire sleeve form screw threads.

It will be noted that in screwing the cap on the terminal 1, the insulation 8 of the conductors will be drawn against the conical surface of the cap. In order to ensure a tight joint, however, a ring 6 of rubber or any other elastic material may be interposed between the ends of the insulation 8 and the conical surface, this ring being also conical to fit the conical surface of the cap. If, before screwing the cap on the terminal 1, liquid shellac is poured into it, the shellac will be forced into the interstices of the metal parts and, upon hardening, will cooperate with the rubber ring 6 and insulation 8 to form an air tight and waterproof joint and will also prevent corrosion of the metal.

When dealing with conductors of large cross-section, the wire of which the sleeve 2 is made may have a triangular cross-section, as indicated in Figure 3, so that the inwardly directed edges of the wire form cutting threads for cutting threads in the terminal 1 as the cap is screwed thereon.

According to the form of the invention illustrated in Figures 4, 5 and 6, instead of employing a sleeve formed of helically wound wire, a sleeve 9 of metal, preferably steel, is used this sleeve being provided internally with screw threads 10. When screwing the cap 5 with its sleeve 9 on to the terminal 1 the chips cut off the conductor wires may cause trouble and to avoid this the sleeve 9 may be provided with one or more longitudinal slots 11. The slots 11 may also serve to provide an elastic connection between the cap of hard rubber or any other insulating material and the sleeve when screwing the cap on the terminal 1. In order to prevent rotation between the sleeve and cap, said sleeve may be provided with barbs 12 which project into the hard rubber or the like of the cap. These barbs do not prevent the sleeve from being forced into the cap but they do prevent the sleeve from being pulled out of the cap or from rotating relative thereto. The head of the sleeve may be made slightly larger in diameter than the rest of the sleeve.

In such case the sleeve may be either forced into the rubber cap or the cap may be cast, or formed in any other manner, around the sleeve as for instance, by inserting the sleeve in a suitable mold and filling said mold with molten rubber and allowing it to cool and harden. When the sleeve is forced into the cap a small space is left between the body of the sleeve and the cap, but as soon as the sleeve is screwed over the twisted terminal 1, the sleeve expands into tight engagement with the inner surface of the cap, this expansion being permitted by the longitudinal slots 11.

15 Another way of forming the head of the sleeve is to give it a polygonal form 13 fitting into a correspondingly formed part of the cap.

Important advantages of my invention arise from the provision of the hard metal sleeve tightly fitting the bore of the cap and provided with internal screw-threads adapted to cut screw-threads in the twisted ends of the conductor wires as the cap is threaded thereon. Other advantages arise from the conical inner surface of the open end of the cap, from the ends of the helical wire sleeve, being bent over and fitting into a groove or grooves in the cap, from the barbs on the metal sleeve, projecting into the material of the cap, from the enlarged and polygonal shaped head of the metal sleeve and from the longitudinal slots in said sleeve.

It is apparent that modifications in the details of construction may be made within the scope of the appended claims without departing from the spirit of my invention.

What I claim is:—

1. A method for joining and insulating electrical conductors, comprising, baring the ends of a number of insulated conductors of their insulation, twisting said bared ends together to form a terminal, screwing upon said terminal an insulating device and simultaneously forming screw threads on said terminal by which it is attached to the insulating device.

2. A process for joining and insulating electrical conductors, comprising, baring the ends of a number of insulated conductors of their insulation for a predetermined distance from the ends thereof, twisting said bared ends together to form a terminal, screwing upon said terminal an insulating device and simultaneously forming screw threads on said

terminal by which it is attached to the insulating device and continuing said screwing movement until the ends of the insulation on said conductors are crowded into said insulating device.

3. The combination, with a plurality of insulated electrical conductors having their end portions bared of their insulation and placed together to form a terminal, of an insulating cap therefor having a metal sleeve forming a lining for said cap and having internal screw-threads, said cap being screwed upon said terminal whereby the screw-threads of said lining are caused to cut screw-threads in said terminal.

4. A method of joining and insulating a plurality of electrical conductors comprising bringing the bared ends of the conductors together to form a terminal, screwing upon said terminal an insulating device and simultaneously forming screw threads on said terminal.

5. A joining and insulating electrical connection comprising a plurality of conductor ends, a joining and insulating device provided with an opening into which said conductor ends are received and means carried by the device for providing a screw thread on said conductor ends during the application of the device thereto.

6. An insulating cap for covering the ends of electrical conductors, comprising an outer sleeve of insulating material and a metal sleeve having internal screw threads and fitted into the bore of said outer sleeve, said metal sleeve being provided with longitudinal slots, to take up the chips cut off the conductor wires, when screwing the cap on the ends of the electrical conductor.

7. A joining and insulating electrical connection comprising a plurality of conductor ends having the insulation removed therefrom for a predetermined distance therealong, a joining and insulating device provided with an opening into which said conductor ends are placed, means carried by the device for providing a screw thread on said conductor ends during the application of the device thereto, the opening in said joining and insulating device being larger in diameter at its outer end so as to cause the insulation on the conductors to wedge therein during the application of the device thereto.

In testimony whereof I affix my signature.
CHRISTIAAN HENDRIK JASPER.