

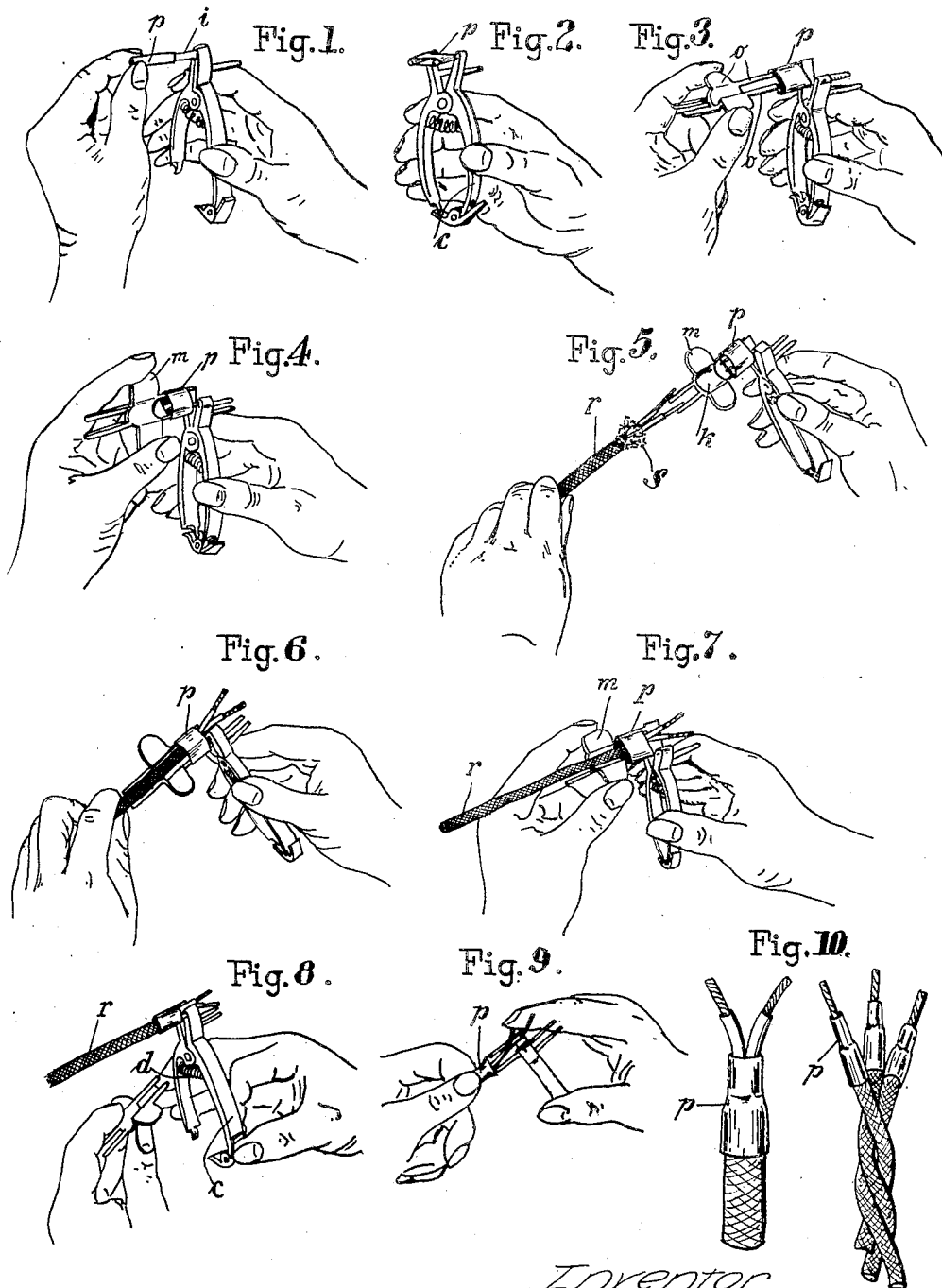
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METHOD OF BINDING INSULATED ELECTRICAL CONDUCTORS

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METHOD OF BINDING INSULATED ELECTRICAL CONDUCTORS

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If insulated electrical conductors or cords are to be connected to a switch or a source of current or to an implement or utensil which consumes electric current, the end or ends of the metallic conductors must first be laid bare. For this purpose it is necessary to remove for a suitable length the silk or other insulation. The usual consequence is that the fibrous ends of the insulation which still remains on the conductor form a tangle which, if care be not taken, will gradually lead to further displacement of the insulation or to unravelling of the threads or fibres. That is, the insulation must be bound again at the bared portion not only for the sake of appearances but in the interest of security. For this purpose there were heretofore used binding threads, insulating tapes or the like which were wound around the insulation and secured by adhesive or knotted. If the binding be not drawn tight, there is no effective security against subsequent displacement of the insulation. Also knots and fastenings effected by adhesive readily give way. The like is true if bare parts of electrical conductors the ends of which are wound together are to be insulated.

Now, the subject of the present invention is an extremely simple method, which can yet be fully depended on, of binding such insulated conductors or bare electrical conductors requiring to be insulated. The method consists in stretching transversely by mechanical means in at least two different directions pieces of rubber tubing or the like cut to suitable length and of minimum bore, and, after insertion of the conductor as far as it is to be covered by the binding, or as far as the insulation is to extend, discontinuing the stretching effort so that the tubing tensionally grips the conductor. The bore of the tubing is, if possible, such that the piece of tubing not only embraces an end of the insulation as well as the adjoining bared portion of the conductor, having sufficient tension to grip the naturally thinner end of wire. Preferably, after insertion of the conductor the stretching effort is gradually discontinued first in the one and then in the other direction.

In the accompanying drawing is the manner of performing the method of the invention. Figs. 1 to 9 show the various stages of operation in the use of the instrument. Fig. 10 shows two conductor sections bound by the method of the invention.

A pliers-like instrument is preferably used, consisting of two jaws adapted to be moved apart by gripping together the handle members *c*. The jaws can be detained in spread position. The jaws each carry one half of each of two impaling pins which are somewhat rounded at one end so that they can be readily introduced into the tubing. When the handles are brought together, the half portions of the impaling pins move apart. One pin is in toto thinner than the other. Associated with this instrument is the accessory instrument *m* consisting of a sheet metal plate or strip having a corrugation *k*, from one lateral edge of which project two pins and from the other lateral edge of which two pins extend, one pair being spaced further apart than the other pair.

The method is carried out as follows.

First, as shown in Fig. 1, the stretcher is held in one hand while with the other hand a piece of tubing *p* is impaled on the split impaling pin *i*, being preferably slightly expanded or stretched. This piece of tubing is cut from a rubber tube the bore of which, if to receive insulated conductors of 6 millimetres diameter, amounts to about 1½ to 2 millimetres, and the wall of which is sufficiently strong to permit the necessary expansion. When this is done, the handles *c* are compressed so that the tubing is powerfully stretched in one direction. Then the accessory instrument *m* is inserted in the expanded tube; that is, for example, the pins *o* are inserted, the spacing of the pins *o* being less than the spacing of the halves of the pin *i* when moved apart (Fig. 3). Then, as shown in Fig. 4, the instrument *m* is turned through 90°, so that the tubing is stretched in two directions at right angles to each other. The instrument *m* can now be released without its returning to initial position. Guided by the corrugation *k* a cord *r* presenting a tassel *s* of insulation formed by exposing the

bared ends of the conductors can now be introduced into the tubing which has been stretched in two directions—see Figs. 5 and 6. Then, as shown in Fig. 7, the instrument *m* is reversely turned through 90° into Fig. 3 position. The tube *p* now grips the conductor *r* at two sides and holds it securely. The conductor can thus be released and the instrument *m* withdrawn from the tube. Then the stretcher handles *c* are so released as to allow the halves of the pin *i* to come together (Fig. 8), the conductor *r* being now gripped by the tube and disengaged from the stretchers (Fig. 9). The binding operation is thus completed.

Such bindings are shown in Fig. 10. As shown, not only the insulated portion but also parts of the protruding wire ends are embraced by the tubing, though this is not necessary. Also bared conductor ends can be insulated by means of a piece of tubing applied in this way, or connected cords can be separately sleeved by tubing as shown.

I claim:—

1. The method of applying a flexible tubular collar to an electrical conductor to surround the same with permanent tension, comprising, stretching the tubular collar transversely so as to distort the cross section of the normal bore thereof into an elongated relatively narrow opening, inserting into the distorted bore, stretching means having a width dimension substantially greater than the diameter of the normal bore of said collar, with its width dimension substantially parallel to the longer dimension of said opening, rotating said stretching means within said distorted bore until it assumes a position in which the tube is stretched in another transverse direction at a substantial angle to the transverse direction in which it was first stretched, inserting the conductor in the stretched tubular collar, and then, discontinuing the stretching effort, permitting the tubular collar to contract and tensionally grip the inserted conductor.

2. The method of applying a flexible tubular collar to cover the junction between the insulated portion and bared end portion of an electrical conductor, with permanent tension, said collar being of smaller normal bore than the diameter of the bared end portion of the conductor, comprising, stretching the tubular collar transversely so as to distort the cross section of the normal bore thereof into an elongated relatively narrow opening, inserting into the distorted bore, stretching means having a width dimension substantially greater than the diameter of the normal bore of said collar, with its width dimension substantially parallel to the longer dimension of said opening, rotating said stretching means within said distorted bore until it assumes a position in which the tube is stretched in another transverse direction at a substantial an-

gle to the transverse direction in which it was first stretched, positioning said collar while thus stretched, relative to said conductor, to cause said collar to encompass said junction, and permitting said collar to contract against both said insulated portion and said bared end portion.

In testimony whereof I have signed my name to this specification.

PAUL FRIEDRICH HELLERMANN.