

June 11, 1935.

D. R. G. PALMER

2,004,901

ELECTRICAL CONDUCTOR

Filed Dec. 18, 1925

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

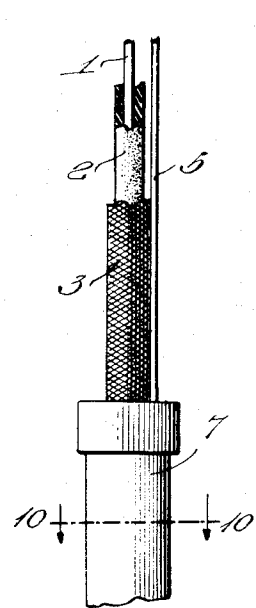
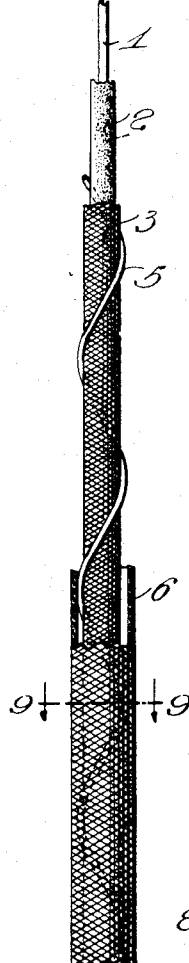
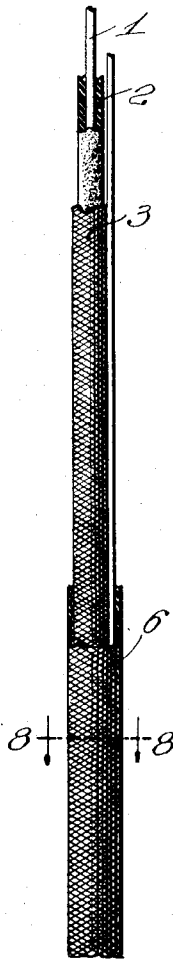
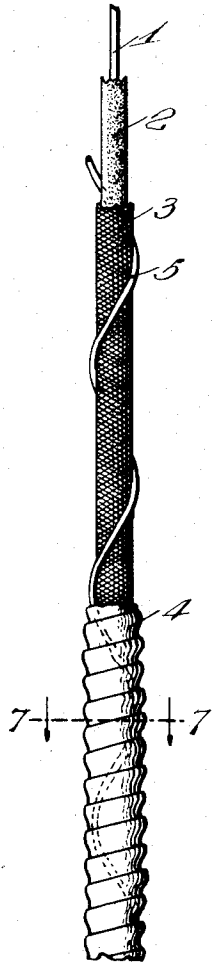
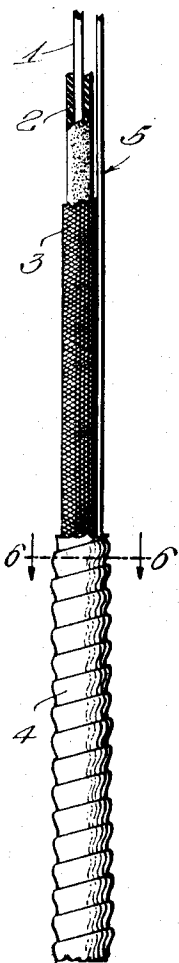


FIG. 11

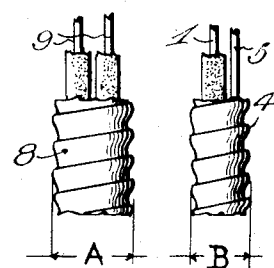


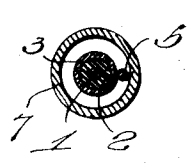
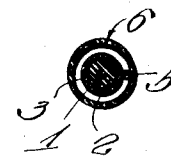
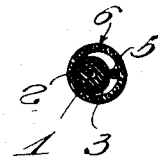
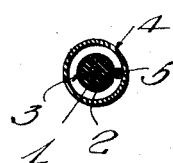
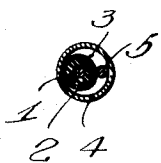
FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10



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UNITED STATES PATENT OFFICE

2,004,901

ELECTRICAL CONDUCTOR

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Application December 18, 1925, Serial No. 76,182

7 Claims. (Cl. 173—267)

My invention relates broadly to electrical conductors and more particularly to a construction of electrical conductor particularly adapted for use in the wiring of buildings and residences for power and lighting current supply to outlets throughout the building.

One of the objects of my invention is to provide an electrical assembly which may be manufactured more inexpensively than assemblies heretofore employed for performing the same service, where less material is required in the manufacture of the assembly and smaller overall size of the assembly is secured than has heretofore been possible in wiring constructed for a similar purpose.

Another object of my invention is to provide a conductor in which a housing sheath is arranged to enclose an insulated and uninsulated electrical conductor where the uninsulated electrical conductor lies adjacent the interior walls of the sheath, the insulated conductor being for the purpose of carrying current while the uninsulated conductor serves for the grounded side of the circuit, that is the neutral conductor, and for polarity identification.

By reason of the construction of the conductor which I provide, I am enabled to save considerable material in its manufacture and yet provide a safe electrical conductor for performing all of the functions of more expensive conductors heretofore available in the art.

My invention will be more fully understood from the following specification by reference to the accompanying drawing, wherein:

Figure 1 is side elevation of an armored cable partially broken away to illustrate the principle of my invention; Fig. 2 is a modified view of an armored cable in which the neutral conductor serves both as a mechanical spacing member for the insulated conductor and as the grounding side of a circuit; Figs. 3 and 4 show applications of my invention to electrical conductors provided with insulated sheaths under which the polarity identification conductor is arranged; Fig. 5 is a fragmentary view of the conductor of my invention housed within a metallic or other conduit; Figs. 6, 7, 8, 9 and 10 are cross-sectional views taken on lines 6—6, 7—7, 8—8, 9—9 and 10—10 of Figs. 1, 2, 3, 4 and 5, respectively; Fig. 11 shows the comparative saving in material in the assembly of my invention over the assembly heretofore available in the art.

In the standard wiring of buildings or residences it is customary to employ flexible armored cable constituted by two or more insulated

conductors housed within a flexible metallic armor. In two conductor cable one wire conveys the current to the service outlet while the other wire is grounded or in neutral and provides the return channel. Both conductors are generally rubber insulated and are mechanically protected by the use of cotton braids or with other insulating or metallic protection. I provide an insulated metallic conductor and an uninsulated conductor of non-corrosive metal which extends parallel to, adjacent to, or is spiralled around the insulated conductor forming a member adjacent to the insulated conductor or conductors and the inner walls of the metallic armor or sheathing. By virtue of the relatively small diameter of the uninsulated conductor the outer metallic armor or sheathing is substantially smaller in diameter than the diameter of armored cable heretofore required in this work. A substantial saving in the material in the manufacture of the assembly is therefore obtained.

Referring to the drawing in more detail, reference character 1 designates a metallic conductor; 2 an insulating covering; 3 a braid or braids thereover impregnated or finished with a moisture repellent. A flexible metallic armor 4 encases the covered conductor 1 and interposed between the outer covering 3 and the inner wall of the sheathing I provide an auxiliary conductor 5 of non-corrosive metal. As represented in Fig. 1, the auxiliary conductor 5 extends parallel to the insulated conductor 1, while in Fig. 2 the conductor 5 is twisted around the insulated conductor and utilizes the armor as a joint ground. In Fig. 3 I have shown the covered conductor 1 encased in a sheath 6 of fibrous material with the auxiliary conductor 5 extending parallel to the covered conductor 1 and immediately beneath the sheath 6.

In Fig. 4 a conductor constructed in accordance with the conductor of Fig. 3 has been illustrated, but the auxiliary conductor 5 is spiralled beneath the fibrous protector 6.

In Fig. 5 I have shown the conductor of my invention housed within a stiff metallic conduit 7 with the auxiliary conductor 5 immediately adjacent the outer surface of the covering 3 in a position to establish electrical connection with the interior walls of the conduit 7.

In Fig. 11 I have shown by reference character 8 the usual armored cable conductor in which twin conductors 9, each separately insulated are encased, the conduit having a diameter represented at A. In my construction the diameter B of the flexible conduit is substantially smaller than the corresponding diameter A. This con-

struction brings about a saving in the cost of manufacture of the cable, the assembly cost, and reduces the expense in material cost by saving the expense of insulation of neutral conductor 5 and reducing the necessary diameter of the flexible conduit 4.

I have found that electrical conductors manufactured in accordance with my invention, described herein, is practical in manufacture and installation and while I have described preferred embodiments of my invention, I desire that it be understood that modifications may be made and that no limitations upon the invention are intended other than those imposed by the scope of the appended claims.

What I claim and desire to secure by Letters Patent of the United States is as follows:

1. An electrical cable comprising a flexible conductor, an insulating covering for said conductor, and a pair of flexible metallic members helically wound around said insulating covering, one of said pair of flexible members having a substantially circular cross-section and serving as a bare neutral conductor, and the other of said pair of flexible members being in the form of a band wound in overlapping and interlocking relation over said aforementioned flexible member of said pair for providing a flexible casing around said insulated member and the other helically wound member.

2. An electrical cable comprising a flexible conductor, an insulating covering for said conductor, and a pair of flexible metallic members helically spirally wound around said insulating covering and having a winding pitch differing one from the other, one of said helical members being wrapped about said insulating covering and serving as a bare neutral conductor and the other of said helical members being constituted by a helically wound interlocking member in electrical and mechanical contact with said aforementioned helical member for encasing said insulating covering.

3. An electrical cable of the class described comprising, in combination, an insulated live-wire conductor, a flexible, helical, metal armor closely surrounding the insulated live-wire conductor, and a bare neutral or return conductor adapted to be connected with the grounded side of the line, said bare neutral conductor being disposed helically between the armor and the insulated conductor and in electrical contact with the former.

4. An electrical cable of the class described comprising, in combination an insulated live-wire conductor, a flexible, helical, metal armor closely surrounding the insulated live-wire conductor, and a bare neutral or return conductor adapted to be connected with the grounded side of the line, said bare neutral conductor disposed helically between the armor and the insulated conductor and in electrical contact with the former, the helix of the bare neutral conductor being of longer convolutions than the helix of the armor, the cable thus constituted being small, equally flexible in all directions and of substantially uniform over-all dimensions.

5. An electrical cable of the class described, comprising, in combination, an insulated live-wire conductor, a flexible, helical, metal armor closely surrounding the insulated live-wire conductor, and a bare neutral or return conductor disposed helically between the armor and the insulated conductor and in electrical contact with the armor, said bare neutral conductor being arranged in much longer convolutions than the armor and being of small dimension radially of the cable.

6. An electric cable comprising, in combination, an insulated live-wire conductor, this wire with its insulation being circular in cross-section, a bare neutral or return wire disposed helically in long convolutions about the insulated conductor, said bare conductor having a relatively small dimension radially of the conductor, and a flexible, helical, metal armor applied in shorter convolutions about both conductors, the whole being a small uniformly flexible cable of substantially uniform over-all dimensions, suitable for house-wiring.

7. An electrical cable comprising, in combination, a flexible conductor, an insulating covering for said conductor, a bare neutral conductor adapted to be connected with the grounded side of a circuit wound helically around the insulated conductor, and a flexible, helically wound metallic armor of shorter lay than the bare neutral conductor surrounding the insulated and bare neutral conductors, the bare neutral conductor and the metallic armor being of the same electrical potential.

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