

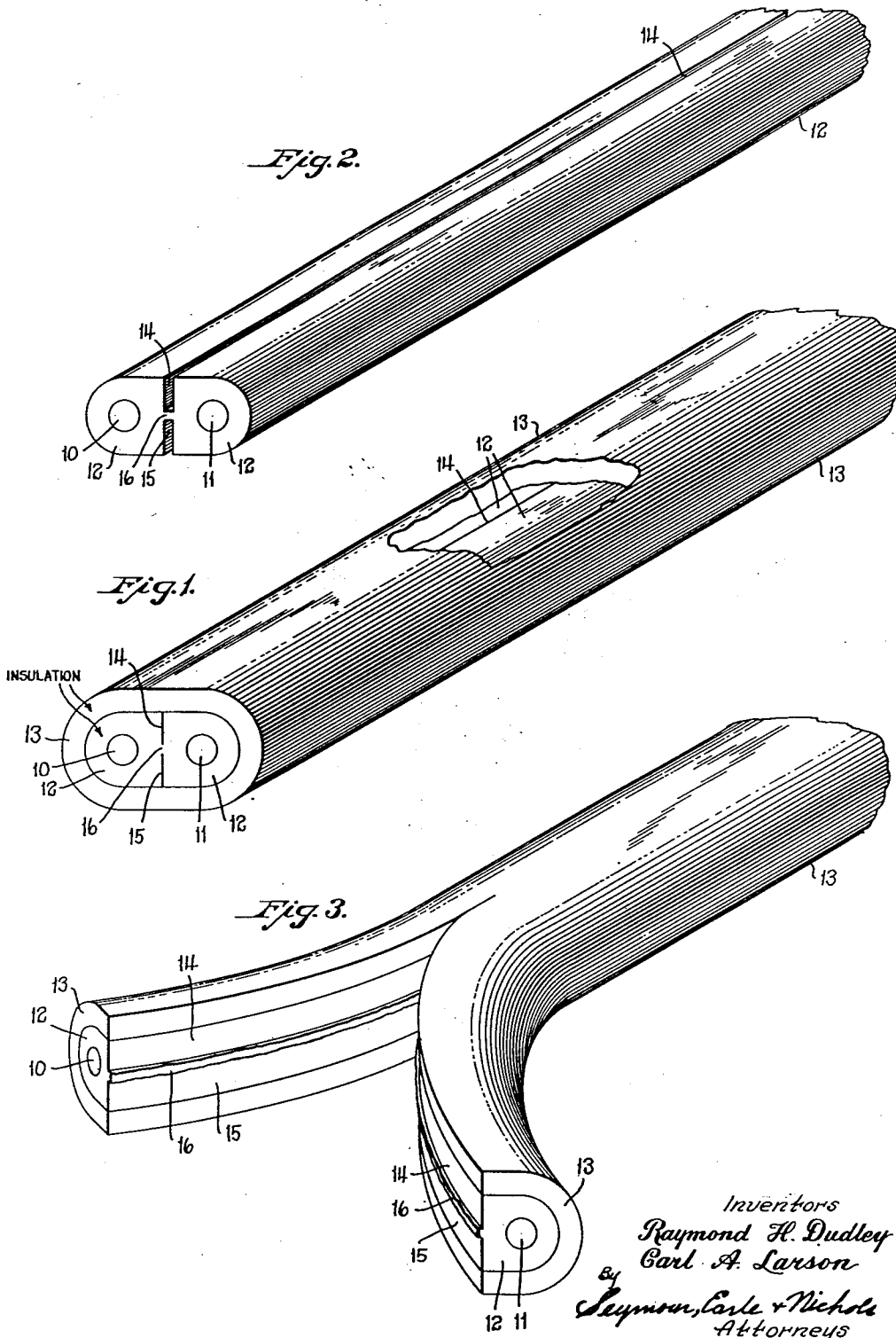
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MULTIPLE CONDUCTOR INSULATED WIRE

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MULTIPLE CONDUCTOR INSULATED WIRE

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The present invention relates to improvements in insulated electric cords or wires and relates more particularly to the type comprising two or more electric conductors physically bonded together but insulated from each other by an inner sheath of insulating material which latter, in turn, is enveloped by an outer sheath of insulating material. Telephone drop wire adapted for outdoor service is a particular example of such cord or wire.

In using insulated multiple conductor wires of the general character above referred to, it is necessary to separate the individual electric conductors from each other together with sufficient of the insulation to maintain coverage for each of the said electric conductors, in order that the said electric conductors may be separately connected to binding-posts, other electric conductors or the like.

In the type of multiple conductor wires referred to, it is both difficult and time-consuming to effect the separation referred to largely for the reason that in longitudinally slitting the outer sheath, care must be taken not to also slit or mutilate the portions of the inner sheath which respectively directly provide insulation for the individual electric conductors. Most often, the outer sheath is so tightly bonded to the inner sheath that the longitudinal slitting of the said outer sheath to any reasonable depth is not sufficient to enable the individual electric conductors to be separated, as before referred to, and the inner insulation is apt to tear off from a given conductor or otherwise become mutilated.

The main object of the present invention is to provide a superior insulated multiple conductor wire having both inner and outer sheaths of the general character referred to but characterized by the ease and facility with which its individual electric conductors may be separated from each other together with the insulation adjacent each thereof.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Figure 1 is a perspective view of a fragment of an insulated multiple conductor embodying the present invention, with a portion of the outer sheath broken away;

Fig. 2 is a fragmental perspective view of the

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inner sheath, together with its pair of electric conductors, shown in the condition which it assumes prior to having the outer sheath applied thereto; and

Fig. 3 is a perspective view of a fragment of the insulated wire of Fig. 1 shown as having its two sheaths of insulation parted to permit the separation of the two individual conductors.

The particular insulated multiple conductor wire herein chosen for purposes of making clear a preferred form of the present invention, includes two (or more) electric conductors or wires 10 and 11 which are laterally spaced from each other and held in such spaced relationship by an inner sheath 12 of insulating material. In the instance shown, both of the conductors are of solid form though it is to be understood that each thereof may be formed of a bundle of small strands as is a common practice in the art. The said insulated wire also includes an outer sheath 13 which also is formed of suitable insulating material.

Many materials are suitable for forming both the inner sheath 12 and the outer sheath 13 such, for instance, as compounds of natural rubber, "neoprene", synthetic rubber, etc. Preferably, the outer sheath 13 is compounded to have superior weather-resistance as compared to the material from which the inner sheath is formed, which latter need only be superior in its insulating properties.

The inner sheath 12 is formed in each of its respective opposite sides intermediate the two conductors 10 and 11, with one of two longitudinal parting-grooves 14 and 15, each of which extends in depth but part way across the said inner sheath toward the other parting-groove. The respective bottoms of the said parting-grooves 14 and 15 are separated from each other by a relatively thin longitudinal coupling-web 16 forming an integral feature of the inner sheath 12 and serving to physically unite the two conductors 10 and 11.

In Fig. 1, the parting-grooves 14 and 15 formed in the inner sheath 12 are shown in the condition in which they appear in the completed drop wire. That is, the coupling-web 16 is deformed and is held under compression by the outer sheath 13 so that the opposite side walls of the respective parting-grooves are held substantially in contact with each other, thus closing the lateral openings of the respective grooves for the reasons which will presently appear.

By reference to Fig. 2 which shows the inner unit of the wire comprising the inner sheath with

its two conductors embedded therein in a condition prior to the application thereto of the outer sheath 13, it will be noted that the longitudinal parting-grooves 14 and 15 are of substantial widths. When, however, as is preferred, the outer sheath 13 is applied by a usual high-pressure extrusion process, the said inner sheath and particularly its integral coupling-web 16, will be compressed and the parting-grooves will be narrowed down into substantial slit-like form, as is indicated in Fig. 1, and will be held in such condition by the circumferential tension of the newly-applied outer sheath 13. Under the conditions just described, the inner surfaces of the outer sheath 13 will bridge over the said parting-grooves without materially entering the same, to thereby avoid having the material of the outer sheath cement the side walls of the said parting-grooves together.

When it is desired to separate the two conductors 10 and 11, together with proportionate shares of the inner and outer sheaths 12 and 13, all that is required is to slit the respective opposite sides of the outer sheath in substantial registry with the respective parting-grooves 14 and 15. Following this slitting, the said conductors 10 and 11 may be separated by tearing the slender coupling-web 16, as is indicated in Fig. 3. This separation of the conductors 10 and 11 may be readily and rapidly effected, inasmuch as the inner surface of the outer sheath 13 has merely bridged over each of the parting-grooves 14 and 15, rather than entering therein sufficiently to cement the opposite surfaces of the said parting-grooves together.

Thus, it will be apparent that by the simple expedient of causing the outer sheath 13 or its equivalent to bridge over the parting-grooves 14 and 15, rather than entering therein, the parting of the two conductors 10 and 11, each with its appropriate share of the inner and outer sheaths 12 and 13, may be readily and conveniently effected. Such procedure would not be possible were the inner portion of the said outer sheath to be permitted to materially enter and cement the opposite side walls of each of the parting-grooves 14 and 15 together.

After the conductors 10 and 11 have been separated as is indicated in Fig. 3, the portions of the inner and outer sheaths 12 and 13 respectively thereon may be stripped off in the usual manner, to bare the said conductors for attachment to the other electric conductors, to binding-posts or the like.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

We claim:

1. A multiple conductor insulated wire comprising: substantially parallel electrical conductors spaced from each other; an inner sheath of insulation within which said conductors are embedded and by which they are held in spaced, insulated condition with respect to each other; said

inner sheath being formed to provide intermediate respectively adjacent conductors a laterally open, longitudinal parting-groove whose side walls, at an intermediate stage of manufacture of the completed wire, are spaced apart a substantial distance, said groove extending in depth only partway through said inner sheath to leave only a relatively slender, integral, longitudinal coupling-web disposed between adjacent portions of said inner sheath, whereby said side walls of said parting-groove are normally urged into substantially parallel spaced-apart relation by said web; and an outer sheath of insulation laterally enveloping said inner sheath and compressing the same under pressure sufficient to positively deform said web and to hold the respective normally spaced-apart side walls of said parting-groove in contact with each other so as to close the lateral opening of said groove.

2. A multiple conductor insulated wire as defined in claim 1, wherein said inner sheath is formed to provide a pair of opposed parting-grooves intermediate respectively adjacent conductors which grooves extend inwardly toward each other only part way through said inner sheath.

3. The method of producing a multiple conductor insulated wire which includes the steps of: forming a unit comprising adjacent electrical conductors spaced from each other by embedding said conductors within an inner sheath of insulation; forming, intermediate adjacent conductors, a laterally open, longitudinal parting-groove of substantial width which extends in depth only part-way through said inner sheath to leave a relatively slender, longitudinal coupling-web integrally uniting the respective portions of said inner sheath on opposite sides of said groove, whereby the side walls of said parting-groove are normally held in substantially parallel spaced-apart relation by said web; laterally compressing the aforesaid unit under pressure sufficient to positively deform said web until the side walls of said groove are in substantial contact with each other whereby the lateral opening of said groove is closed; and then applying an outer sheath of insulation over said unit while thus laterally compressed to maintain said unit under compression within said outer sheath in the completed wire.

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