

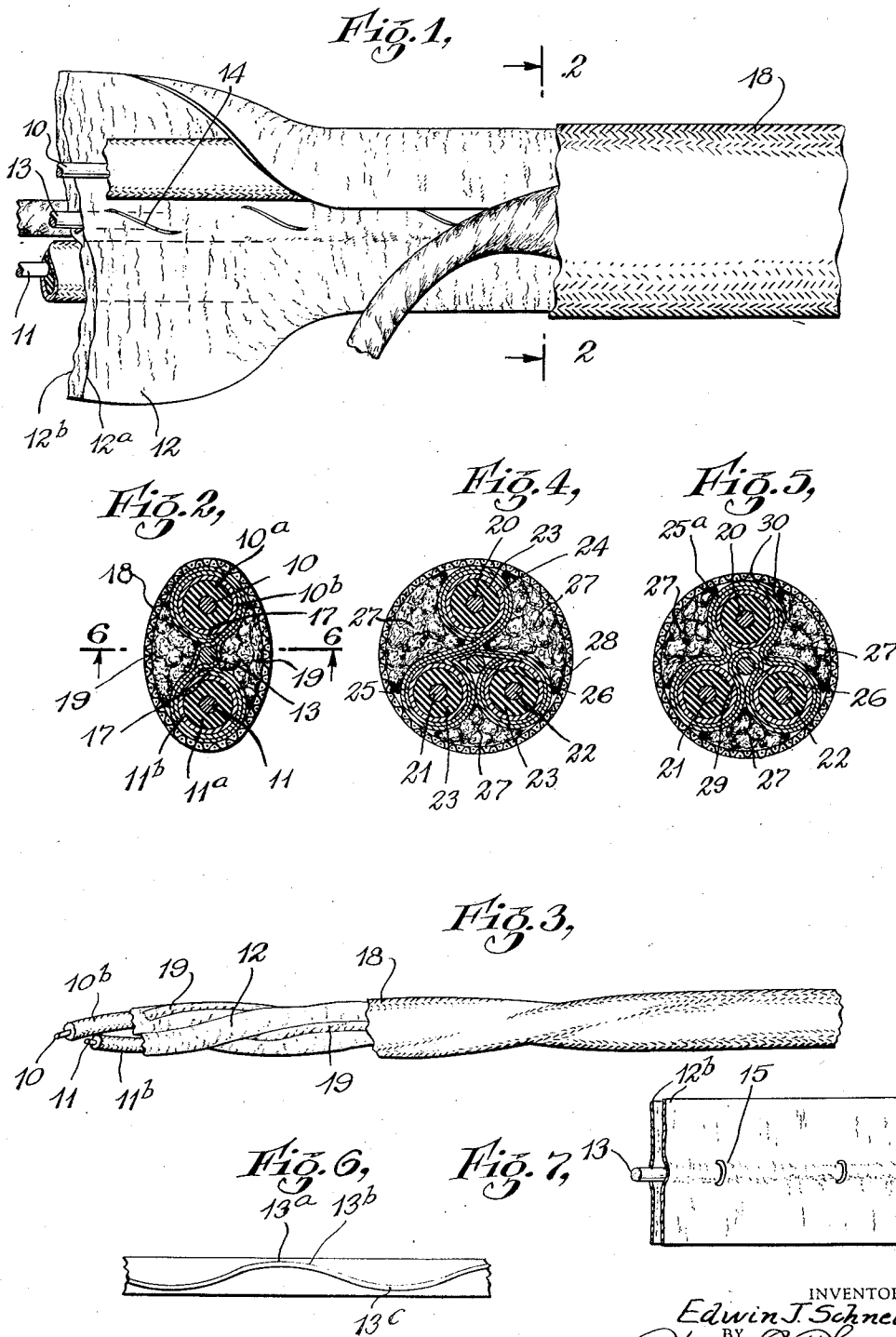
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CONDUCTOR

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CONDUCTOR

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This invention relates to electric conductors more commonly known as non-metallic sheathed cable, wherein two or more insulated strands are contained within an outer non-metallic sheath or casing; and the object of the invention is to provide an improved and simplified form of protector casing or jacket involving a comparatively wide strip or body of two or more thicknesses, and of a crinkled or gathered texture which is wrapped around or envelops the insulated conductors and is arranged within the outer casing or jacket; a further object being to provide means for coupling a ground wire or strand with said protector casing or the separate sheets thereof so as to extend said strand longitudinally of the conductors and intermediate the same in a straight or wave-like fashion; a further object being to provide means for retaining a ground wire against displacement with respect to the strip body used in forming the protector casing; and with these and other objects in view, the invention consists in a conductor of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a side view of a non-metallic sheathed cable made according to my invention with part of the construction broken away and illustrating the manner of applying the protector to the insulated conductors.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 on a reduced scale, and showing a twisted arrangement of the separate conductors with the protector casing thereon.

Fig. 4 is a view similar to Fig. 2 showing a three conductor strand cable.

Fig. 5 is a view similar to Fig. 4 showing a different arrangement of the protector casing.

Fig. 6 is a sectional and side view taken

on the line 6—6 of Fig. 2 showing a modified form of construction, omitting several of the parts; and,

Fig. 7 is a detail view of a strip body from which the protector casing is formed, showing a modified method of attaching the ground wire thereto.

In the construction shown in Figs. 1 and 2 of the drawings, I have shown a non-metallic sheathed cable employing two conductor strands 10 and 11 which are first enclosed in a body of rubber or other insulating material 10a and 11a, upon which is a braided or other casing or jacket 10b and 11b.

In carrying my invention into effect, I provide a comparatively wide, strip-like body 12 from which a protector casing or jacket is to be formed, and in the construction shown, this body is of two-ply thickness or consists of sheets 12a and 12b. Arranged centrally and longitudinally thereof and preferably between the sheets 12a and 12b is a ground wire or strand 13, which as shown in Fig. 1 of the drawings, is held in position against displacement by stitchings 14 passed through the separate sheets and encircling the wire 13. For example, in Fig. 7 of the drawings, I have shown the wire 13 held in place between the sheets 12a and 12b by staples or clips 15 which are preferably non-metallic.

The separate sheets from which the strip 12 is formed is preferably composed of crinkled or crepe paper which is also preferably treated to render the same moisture-proof, and may also be treated to render the same fire proof depending upon the nature of the compound used in saturating the sheet.

In the production of the complete conductor, the strip 12 or the separate sheets thereof are arranged between the insulated conductors in the manner seen in Figs. 1 and 2 of the drawings, and the separate side portions of the sheet are wrapped or coiled about each insulated conductor to bring said side portions between the ground wire 13 and the separate conductors as seen at 17, note Fig. 2 of the drawings, to form at least a two-ply thickness, and preferably a three ply thickness to insulate the ground wire from

the conductors 10 and 11 and the casings or jackets thereon.

In completing the cable the outer braided casing or jacket 18 is applied to the conductors enclosed in the casing formed from the strip 12, and in this operation, filler cords or strands 19 are preferably laid in the valleys between the adjacent conductors, the same being sufficiently flexible to assume a position somewhat similar to that shown in cross section in Fig. 2.

In Fig. 3 of the drawings, I have shown a construction identical in all respects to that shown in Figs. 1 and 2, in which figure, like references will designate like parts, the only difference being that the entire product is twisted in the manner illustrated to show that either form of construction may be employed; that is to say, the conductors 10 and 11 may be arranged parallel in an untwisted state as in Figs. 1 and 2, or in the twisted state shown in Fig. 3.

In Fig. 4 of the drawings, I have shown a modified form of construction wherein three conductors 20, 21 and 22 are employed, each conductor being contained first in a rubber body or jacket 23, and then in a braided casing or jacket 24, the same as in the structure shown in Figs. 1 and 2. In this construction, a protector casing or jacket 25 of strip material is applied to encircle the insulated conductors 20, 21 and 22, the central portion of the two-ply strip from which the casing 25 is formed being first encircled about the conductor 21, and the side portions of said strip after passing between the conductors 20 and 22, and is then wrapped around said conductors in the manner shown.

With this structure, the ground wire or strand 26 is preferably positioned in the valley formed between the three conductors and is arranged between that part of the casing 25 encircling the conductors 21 and 22. With this construction, the ground wire 26 may be attached to one part of the casing 25 in applying the same to the several conductors, preferably that side portion which extends from the conductor 21 across to the conductor 22. With this construction, filler pieces 27 are arranged in the outer valleys formed between the conductors, and the entire product is arranged in the outer braided casing or jacket 28.

The construction shown in Fig. 5 is identical as to the several elements, with that shown in Fig. 4, and like references will designate like parts, the difference being in the manner of arranging the protector casing or jacket 25a upon the insulated conductors. In this construction, the central portion of the two ply strip from which the casing 25a is formed, is first wrapped around and secured to the ground wire 26, being held in position by stitchings 29, after which the side portions of the strip are first circled around the conduc-

tors 21 and 22 and then extend around the conductor 22, the side edges being overlapped as seen at 30. In the last form of the strip, parts thereof extend into the valleys between the respective conductors 20—21 and 20—22 so as to insulate said conductors one from the other.

In the construction shown in Figs. 4 and 5, the same type of crinkled or crepe paper treated with water proofing and/or fire-proofing compound is employed. In this connection, it will also be borne in mind that the braided casing enclosing the separate conductors such for example as the casings 10b and 11b are also similarly treated, and this applies to the outer casing or jacket 18 and 28.

In Fig. 6 of the drawings, I have shown another modification which modifies the structure shown in Figs. 1 and 2, simply in that in arranging the ground wires 13a within and between the separate conductors, instead of extending in a straight, parallel line with respect to the conductors, it is arranged in a curved or wave-like line so as to arrange portions 13b in the upper part of the valleys, and portions 13c in the lower valleys intermediate the conductors. In this figure, only one of the conductors is shown, and the various elements of the cable are omitted in order to simplify the illustration, but it will be understood that the cable is made in accordance with the structure shown in Figs. 1 and 2.

The purpose of this construction is to render the ground wire more flexible in its adaptation to twists and bends to which the cable is subjected in the use thereof, and to avoid the possibility of rupture or breakage or any distortion thereto. In this connection, it will be understood that the crinkled or crepe paper will also provide for the necessary flexure of the cable in its use, without danger or rupturing the same, and at all times will maintain a protector casing or jacket enclosing the respective conductors.

It will also be apparent that with a protector casing such as that disclosed, the severing and separation of end portions of a conductor in making electrical connections is materially simplified, avoiding the necessity of unravelling or otherwise removing protector coverings such as heretofore employed. While I have shown certain specific uses of my invention, it will be apparent that I am not necessarily limited in these respects and various changes in and modifications of the construction herein set out, may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A non-metallic sheathed cable comprising conductor strands arranged in bodies of

insulating material, a protector casing comprising a strip of flexible material mounted to envelop said insulated conductors and arranged within an outer braided sheath, and said strip being composed of longitudinally extensible material and comprising a plurality of sheets and a ground conductor disposed between the sheets of said strip.

2. In a cable of the class described comprising insulated conductors contained in an outer casing, a protector casing comprising an elongated strip body arranged in parallel relation to the conductors, said body being wrapped about said conductors to form protector casings therefor and an insulating body disposed therebetween, said strip body being composed of material capable of longitudinal extension, and being of multiple thickness, and a ground wire arranged between the separate thicknesses of said strip body.

3. In a cable of the class described comprising insulated conductors contained in an outer casing, a protector casing comprising an elongated strip body arranged in parallel relation to the conductors, said body being wrapped about said conductors to form protector casings therefor and an insulating body disposed therebetween, said strip body being composed of material capable of longitudinal extension and being of multiple thickness, a ground wire arranged between the separate thicknesses of said strip body, and means for retaining said ground wire against displacement.

4. In a cable of the class described comprising insulated conductors contained in an outer casing, a protector casing comprising an elongated strip body arranged in parallel relation to the conductors, said body being wrapped about said conductors to form protector casings therefor and an insulating body disposed therebetween, said strip body being composed of material capable of longitudinal extension and being of multiple thickness, a ground wire arranged between the separate thicknesses of said strip body, means for retaining said ground wire against displacement, and said ground wire being offset laterally to form a wave-like contour.

5. In a cable involving insulated conductors arranged in an outer sheath or casing, a protector casing fashioned from a comparatively wide strip of crinkled paper, portions of said strip being disposed between the conductors, other portions of said strip being wrapped about said conductors to form protector casings therefor, and said strip being composed of a plurality of sheets and a ground conductor arranged between said sheets and retained against displacement therefrom.

6. In a cable of the class described comprising insulated conductors contained in an outer casing or jacket, an elongated strip-

like body of flexible material adapted to be wrapped around the conductors prior to mounting of the outer casing or jacket thereon, portions of said strip being arranged intermediate said conductors, said strip substantially enveloping the conductors, and a ground conductor attached to the strip and insulated thereby from the first named conductor.

7. A non-metallic sheathed cable of the class described comprising conductor strands contained first in a body of rubber and then in a braided casing forming independent insulated conductor strands, a protector casing comprising an elongated strip extending longitudinally of said conductors having portions of said strip disposed between the conductors and with the remainder thereof substantially enveloping said conductors, an outer braided casing arranged upon said last named casing, all of said casings being treated to render the same fire and moisture proof, and said protector casing comprising a sheet body of crinkled paper including a ground conductor disposed between the separate sheets.

8. A non-metallic sheathed cable comprising conductor strands arranged in bodies of insulating material, a protector casing comprising a comparatively wide strip adapted to be arranged longitudinally of and intermediate said conductor strands, the side edge portion of said strip being looped snugly around the bodies of insulating material on said conductors to envelop the same, an outer braided sheath arranged on said conductors and the protector casing thereon, and a ground conductor attached to said protector casing and extending longitudinally of said first named conductors.

9. A non-metallic sheathed cable comprising conductor strands arranged in bodies of insulating material, a protector casing comprising a comparatively wide strip adapted to be arranged longitudinally of and intermediate said conductor strands, the side edge portion of said strip being looped snugly around the bodies of insulating material on said conductors to envelop the same, an outer braided sheath arranged on said conductors and the protector casing thereon, a ground conductor attached to said protector casing and extending longitudinally of said first named conductors, and said ground conductor being offset laterally to form a wave-like contour.

10. The combination with electric conductors of the class described, of a protector casing comprising a comparatively wide strip of insulating material adapted to be arranged longitudinally of and intermediate said conductors, the side edge portions of said strip being looped snugly around said conductors to envelop the same, and a strand circular in cross sectional form arranged longitudi-

nally of said casing and adapted to be disposed between the adjacent surfaces of said conductors to space said conductors one from the other.

- 6 11. The combination with electric conductors of the class described, of a protector casing comprising a comparatively wide strip of insulating material adapted to be arranged longitudinally of and intermediate said conductors, the side edge portions of said strip
10 being looped snugly around said conductors to envelop the same, a strand circular in cross sectional form arranged longitudinally of said casing and adapted to be disposed between the adjacent surfaces of said conductors
15 to space said conductors one from the other, and said strand being attached to the central portion of said casing.

In testimony that I claim the foregoing
20 as my invention I have signed my name this 2nd day of January, 1929.

EDWIN J. SCHNEIDER.

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