Jan. 7, 1930. E. J. SCHNEIDER ET AL 1,742,488

INSULATION SHIELD FOR ELECTRIC WIRING

Filed March 21, 1929

Fig. 1.

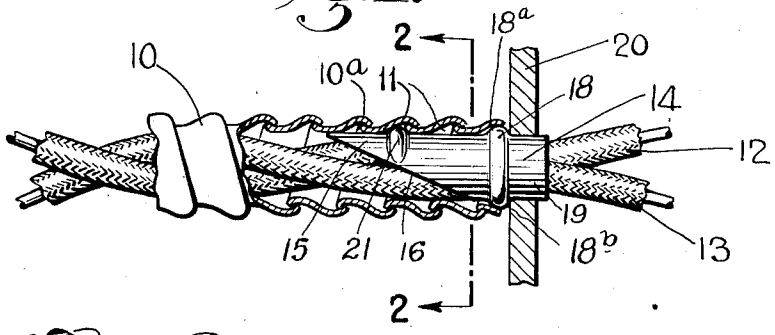


Fig. 2.

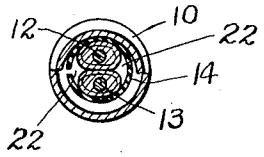


Fig. 3.

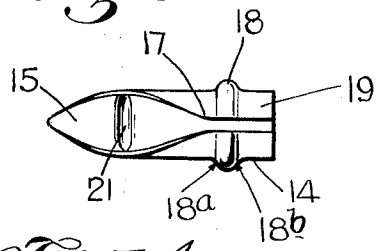


Fig. 5.

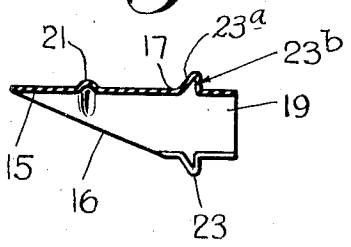


Fig. 4.

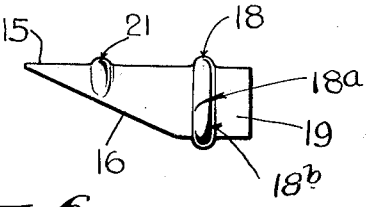


Fig. 6.

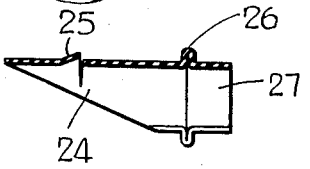
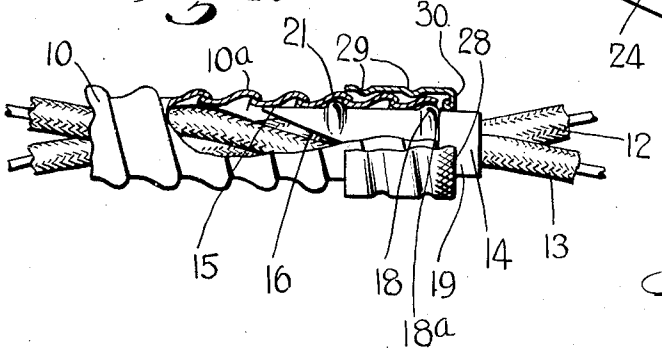


Fig. 7.



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UNITED STATES PATENT OFFICE

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INSULATION SHIELD FOR ELECTRIC WIRING

Application filed March 21, 1929. Serial No. 348,744.

This invention relates to electric wiring of various kinds and classes and especially where two or more wires are arranged in and passed through a metallic outer casing or jacket of any kind or class and particularly to the provision of a shield of insulating material adapted to be arranged within an end portion of the casing and between it and the wires contained therein to protect said wires and shield them from coming in contact with sharp edges of said casing; and the object of the invention is to provide a shield of the class and for the purpose specified, the main body portion of which is shield-like in form and comprises an arc-shaped wall, opposite side edges of which are curved and tapered to form a pointed or prong-like end and the other end of the shield extending in the form of a split tube forming a finger piece and insulating collar; a further object being to provide adjacent the last named or collar end of the shield, an annular outwardly projecting member which forms a stop and flange adapted to overlie the edge of the metallic casing, said enlarged portion being preferably tapered at its free end to operate as a wedge to securely retain the shield in position and to place the wires under slight compression within the outer casing and to expand said outer casing when composed of the flexible type; a further object being to provide the inner or prong end portion of the shield with an outwardly pressed portion adapted to engage one of the coils of a flexible metallic casing to aid in securing the shield against displacement; a still further object being to provide a shield of the class described which is composed of inexpensive material, and which is preferably coated with a greasy or wax-like element to render the same moisture proof and to facilitate the operation of applying the same; and with these and other objects in view, the invention consists in an insulator 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 drawing forms a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a diagrammatic, sectional view, illustrating one method of arranging a shield made according to the invention, within a metallic casing and between it and the wires contained therein.

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

Fig. 3 is a face view of the shield shown in Fig. 1, detached.

Fig. 4 is a side view of the shield shown in Fig. 3.

Fig. 5 is a longitudinal, sectional view through a shield showing a slight modification.

Fig. 6 is a view similar to Fig. 5 showing another modification, and,

Fig. 7 is a view similar to Fig. 1 showing another modification.

In Figs. 1 and 2 of the drawing, a conductor or cable of the flexible armored type is shown to illustrate one use of the invention. In these figures, 10 represents a flexible metallic casing fashioned from a spirally wound strip of metal 10^a, the side edges of which are fashioned to interlock adjacent windings as in conventional casings of this class, and this structure forms spiral recesses 11 on the inner surface of the casing. It will be understood at this time that the outer metal casing may be of any desired form and construction and may constitute a metal tube. Arranged in the casing 10 are two or more insulated conductors, two of which are shown in the accompanying drawing and are designated by the reference numerals 12 and 13. These conductors may be of any desired construction in so far as the insulation is concerned.

At 14, we have shown one of our improved insulator shields, which shield is shown in Figs. 1 to 4 inclusive, the same being made from inexpensive, flexible and yet firm insulating material of any kind or class such for example as fibre, bakelite, hard rubber, paper board and so forth, one end portion of the shield being fashioned to form a pointed or pronged end 15, the side walls 16 of which are curved and tapered in the manner shown

from the pointed end 15 to the point 17 where the shield is substantially cylindrical in form, being split longitudinally of its wall to permit the expansion and contraction of the shield in the operation of inserting it into the casing 10.

Outwardly of the point 17, the shield is provided with an annular body 18, the inner wall 18^a of which tapers gradually onto the cylindrical wall and the outer wall 18^b of which is similarly tapered, the latter being more abrupt however; and the wall 18^a terminates in a straight cylindrical and projecting collar 19 which serves as a finger piece and as an insulating collar adapted to be arranged within an aperture in a fixture casing or other body part 20 which is partially illustrated in Fig. 1 of the drawing, so as to insulate the conductors 12 and 13 where it passes into and through the body 20. It is also preferred that the pointed end portion of the shield be provided with an outwardly pressed bead 21 arranged substantially centrally of said pronged end portion and at a point opposite the split side of the shield to form a retaining member of said bead which will operate in the recesses 11 of one of the coils to aid in holding the shield against displacement.

In armored conductors of the class referred to, the arrangement of the conductors 12 and 13 within the casing 10 forms at opposite sides of the casing and therewithin, valleys or spaces designated by the reference numeral 22, note Fig. 2. In the use of the shield, the pointed or pronged end 15 thereof is inserted into the casing by placing said end in one of the recesses 22. As the prong is pressed into the casing 10 and around the conductors 12 and 13, the curved and beveled walls 16 of the shield operate to feed and guide the shield in its inward movement, offering no resistance in this operation except that the bead 21 will establish a slight resistance in passing over the inwardly projecting portions arranged between the recesses 11.

In completing the inward movement of the shield, the beveled wall 18^a of the annular body 18 will operate to firmly compress the conductors 12 and 13 and further to expand the casing 10, especially when this casing is constructed of the flexible type. If a rigid casing is employed, the result will be simply to compress and firmly retain the conductors in position and also to support the shield. It will be understood that the collar 19 will extend beyond the free end of the casing, and the body 18 serves as a shield or guard, arranged at the free edge of the casing in spaced relation with reference to the conductors by virtue of the air chamber formed within the bead outwardly of the conductors.

In Fig. 5 of the drawing, we have shown a slight modification of the structure shown in Figs. 1 to 4 inclusive. In this figure, the reference characters 15, 16, 17, 19 and 21 will designate like parts, and substituted for the bead 18 is a bead 23, differing from the bead 18 in that one wall 23^a tapers gradually onto the wall of the pronged end up to the point 17, whereas the other wall 23^b is arranged at right angles to the longitudinal wall of the shield.

In Fig. 6 of the drawing, we have shown another modification wherein the pronged end 24 of this shield has a freely flexing tongue part or lock shoulder 25 cut therefrom instead of the bead 21. The arrangement of the shoulder 25 is such as to permit the shield to pass freely into the casing of a cable or to allow the same to extend into the recess 11 to retain the shield against accidental displacement.

In this construction, we have substituted for the annular beads 18 and 23 shown in the other figures, an annular bead 26 which is more in the form of a flange and is fashioned by pressing the wall of the shield outwardly to form a flange of two-ply thickness which is adapted to butt against the outer edge of the casing 10 in the use of the shield. In other words, the beveled wall and wedge-like action accomplished thereby as in the other figures, will not take place in this structure, it being understood, however, that the placement of the shield in the casing and around the conductors, which normally fits snugly in the casing, is sufficient to place the conductors under slight compression, but the degree of operation will not be as great as in the use of the tapered wall structure shown in Figs. 1 to 5 inclusive. The shield shown in Fig. 6 also includes an outwardly projecting collar 27 which forms the resulting collar and finger piece as in the other structures.

In Fig. 7 of the drawing, we have shown another modification wherein a ferrule 28 of conventional form is employed in conjunction with a shield made according to the several disclosures, the shield shown in Figs. 1 to 4 inclusive being preferably employed, and like references will designate like parts with respect to said shield, which is designated at 14, and consists of the pronged end 15, tapered wall 16, the outwardly projecting member or bead 18 and the collar 19.

The ferrule 28 is of a type having a screw threaded end portion 29 adapted to engage the spirally arranged strips 10^a in the manner of screwing a nut upon a thread. The projecting member 18 of the shield 14 is preferably arranged in a position to meet the threads 39 of the ferrule so as to provide means for locking the shield against displacement from the end of the casing 10. The outer end of the ferrule has an inwardly turned flange 30 engaging the enlargement or member 18 to accomplish this result. It will also be noted that the projecting collar serves to insulate conductors 12 and 13. It is customary to employ metallic ferrules, and

while this type of ferrule may be employed, it will also be understood that non-metallic devices of this class may be used. It is also preferred that the outer surfaces of the ferrule be roughened or nurled to facilitate the attachment of the ferrule.

In the use of the device, the shield 14 is first placed in position between the conductors and the casing, after which the ferrule is applied and threaded upon the shield and the casing 10 as above stated, and the ferrule will operate to firmly draw the shield inwardly, as will be apparent.

It will be noted in considering Figs. 1 and 2 of the drawing, that the outside diameter of the shield or the enlargement thereof is within the boundaries of the diameter of the casing 10 so as not to introduce a projecting body. This will avoid the possibility of accidental displacement of the shield in handling the same, and will also facilitate the insertion of the cable into the knock out openings of terminal boxes of various kinds and classes.

It will be understood that while we have shown a few forms of shields for carrying our invention into effect, and have illustrated one particular use thereof, that our invention is not necessarily limited to the specific details of construction herein shown and described, nor to the uses herein set out, and various other changes in and modifications of the structure herein disclosed may be made within the scope of the appended claims without departing from the spirit of our invention or sacrificing its advantages.

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

1. The combination with insulated electric conductors arranged in an outer metallic casing, of a shield composed of insulating material adapted to be arranged between the insulated conductors and said casing, the end of the shield inserted into the casing being of prong formation and the outer end of the shield comprising a split tube having an outwardly extending body adapted to engage the end portion of the casing to firmly retain the conductors within the casing and to insulate the same therefrom, and said outwardly extending body having a tapered wall whereby said shield may be wedged in position.

2. The combination with insulated electric conductors arranged in an outer metallic casing, of a shield composed of insulating material adapted to be arranged between the insulated conductors and said casing, the end of the shield inserted into the casing being of prong formation and the outer end of the shield comprising a split tube having an outwardly extending body adapted to engage the end portion of the casing to firmly retain the conductors within the casing and to insulate the same therefrom, said outwardly extending body having a tapered wall, whereby said shield may be wedged in position, and the prong end of said body including an outwardly pressed member adapted to engage the bore of said casing to aid in retaining the shield against displacement.

3. The combination with insulated electric conductors arranged in an outer metallic casing, of a shield composed of insulating material adapted to be arranged between the insulated conductors and said casing, the end of the shield inserted into the casing being of prong formation and the outer end of the shield comprising a split tube having an outwardly extending body adapted to engage the end portion of the casing to firmly retain the conductors within the casing and to insulate the same therefrom, said outwardly extending body having a tapered wall whereby said shield may be wedged in position, and said shield including an outwardly projecting collar forming a finger piece and insulating member.

4. The combination with insulated electric conductors arranged in an outer metallic casing, of a shield composed of insulating material adapted to be arranged between the insulated conductors and said casing, the end of the shield inserted into the casing being of prong formation and the outer end of the shield comprising a split tube having an outwardly extending body adapted to engage the end portion of the casing to firmly retain the conductors within the casing and to insulate the same therefrom, and the side edge walls of the prong end of said shield being curved and tapered from the pointed end thereof to said outwardly extending body.

5. An insulator shield for conductors of the class specified comprising a split tubular body, the walls of the split portion being beveled and curved at one end of said body to form a prong end portion and the other end of said body having a radially and outwardly projecting member, one wall of which is tapered in the direction of the prong end of the body.

6. An insulator shield for conductors of the class specified comprising a split tubular body, the walls of the split portion being beveled and curved at one end of said body to form a prong end portion and the other end of said body having a radially and outwardly projecting member, one wall of which is tapered in the direction of the prong end of the body, and the last named end of the body having a collar arranged outwardly of said member.

7. An insulator shield for conductors of the class specified comprising a split tubular body, the walls of the split portion being beveled and curved at one end of said body to form a prong end portion and the other end of said body having a radially and outwardly projecting member, one wall of which is

tapered in the direction of the prong end of the body, the last named end of the body having a collar arranged outwardly of said member, and another radially and outwardly pressed member arranged in said body intermediate the pointed end of said body and the first named member.

8. An insulator shield for armored conductors of the class specified, comprising a split tubular body of insulating material, one end portion of which is adapted to be inserted in the armor and arranged between it and the conductors, the outer end portion of said shield having a radially projecting annular member, the diameter of said member being substantially equal to the outside diameter of said armor, and said radially projecting member being arc-shaped in cross sectional form.

9. An insulator shield for conductors of the class specified comprising a split tubular body of insulating material, said body having a radially and outwardly extending member arranged inwardly of one end thereof, and one wall of said member being tapered in the direction of the other end of said body.

10. An insulator shield for conductors of the class specified comprising a split tubular body of insulating material, said body having a radially and outwardly extending member arranged inwardly of one end thereof, one wall of said member being tapered in the direction of the other end of said body, and the second named end of said body being of prong formation.

In testimony that we claim the foregoing as our invention we have signed our names this 18th day of March, 1929.

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