Aug. 26, 1947. R. A. MINARIK 2,426,466

INSULATOR FOR ELECTRICAL WIRE CONDUCTORS

Filed Dec. 7, 1943

FIG. 1.

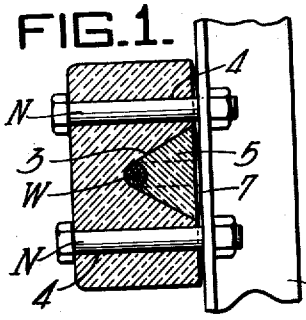


FIG. 2.

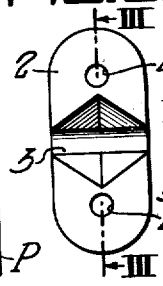


FIG. 3.

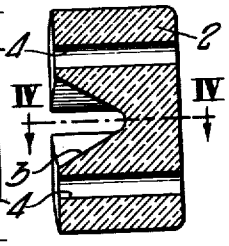


FIG. 5.

FIG. 6.

FIG. 7.

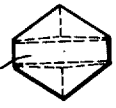


FIG. 8.

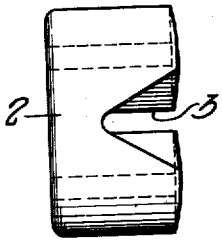


FIG. 9.

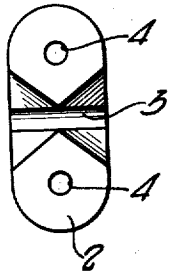
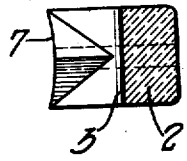


FIG. 4.



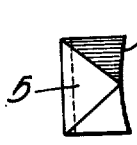


FIG. 10.

FIG. 11.

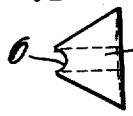


FIG. 12.

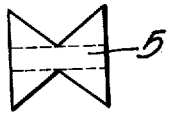


FIG. 13.

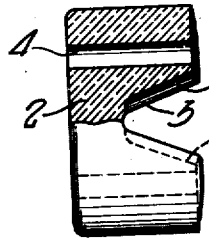


FIG. 14.

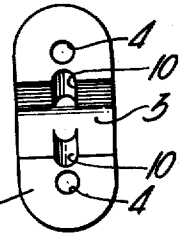
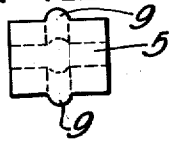


FIG. 15.

FIG. 16.



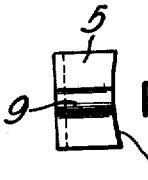


FIG. 17.

FIG. 18.

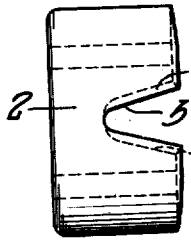


FIG. 19.

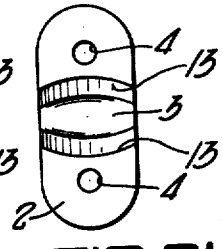


FIG. 20.

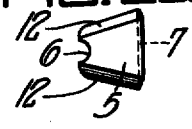


FIG. 21.

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UNITED STATES PATENT OFFICE

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INSULATOR FOR ELECTRICAL WIRE CONDUCTORS

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10 Claims. (Cl. 174—156)

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This invention relates to insulators for electrical wire conductors, and particularly to an improved insulator of the knob type which is especially adaptable for use for supporting the conductor of electrical wire fences.

In the installation of electrically charged wire fences, an insulator of the knob type is generally used. Such an insulator consisted usually of a cylindrical body member having a groove arranged in the periphery thereof adjacent one end of the insulator in which the conductor or barbed wire was positioned which was held therein by means of a tie-wire wrapped around the insulator. Such an insulator was unsatisfactory not only in that an extra piece of wire or tie-wire was needed to attach the conductor to the insulator, but such an insulator did not properly support the conductor and the same tended to sag between the insulator or points of support.

Various other types of insulator have been heretofore suggested and used but these too were not altogether satisfactory. Such insulators either consisted of an excessive number of parts which were relatively expensive to fabricate or were difficult to assemble and attach to the support or fencing element without the use of special tools.

Accordingly, it is an object of the present invention to provide an improved electrical insulator for wire conductors which is simple and inexpensive in its construction and use wherein the above mentioned disadvantages are eliminated.

It is another object of the invention to provide an improved electrical insulator consisting of a minimum number of parts which can be easily fabricated whereby the insulator can be conveniently and quickly assembled and attached to the fencing element or support with which it is adapted to be used.

It is a more specific object of this invention to provide an insulator which grips firmly the wire conductor so as to prevent any longitudinal movement of the wire relative to the insulator whereby any sagging characteristics of the wire conductor are eliminated.

Various other objects and advantages of this invention will be more apparent in the course of the following specification and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown, for the purpose of illustration, several embodiments which my invention may assume in practice.

In these drawings:

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Figure 1 is a vertical sectional view through the improved insulator of my invention;

Figure 2 is an elevational view of the inner side thereof with the insert member removed;

Figure 3 is a sectional view taken on line III—III of Figure 2;

Figure 4 is a sectional view taken on line IV—IV of Figure 3;

Figures 5, 6 and 7 are side, end and plan views, respectively, showing details of the preferred type of insert member to be used with my improved insulator;

Figures 8 and 9 are side and end elevational views, respectively, of a modified form of insulator body in accordance with my invention;

Figures 10, 11 and 12 are side, end and plan views, respectively, showing details of the insert member to be used with the modification shown in Figures 8 and 9;

Figure 13 is a side elevational view partly in section of another modified form of insulator body member of my invention;

Figure 14 is a side view of Figure 13;

Figures 15, 16 and 17 are end, plan and side views, respectively, of the insert member to be used with the modification shown in Figures 13 and 14;

Figures 18 and 19 are side and end elevational views, respectively, of a further modified type of insulator body of the present invention; and

Figures 20 and 21 are end and plan views, respectively, of the insert member to be used with the modification shown in Figures 18 and 19.

Referring more particularly to the drawings, the preferred embodiment of my improved insulator, as shown in Figures 1 through 7 of the drawings, comprises a body member 2 having an open ended slot or a transverse channel opening 3 arranged on the inner side thereof which extends into the body member to substantially the center thereof. The body member 2, as shown, is rectangular-shaped, but it will be understood that it may be cylindrical or any other desired shape. To either side of the opening 3, there is arranged in and through the body member, a hole 4 through which a bolt, nail, screw, or any other suitable attaching means is adapted to be inserted for attaching the same to the support, such as a fence post P, with which the insulator is adapted to be used.

There is arranged in the opening 3 of the body member, an insert member 5 which is preferably wedge-shaped as is the opening 3 in which it is positioned. The preferred type of insert member, as shown more clearly in Figures 5, 6

and 7, is preferably double wedge-shaped or substantially diamond-shaped in cross section. In any event, the sides of the insert member should be irregular shaped or non-planar and, likewise, the side walls of the opening 3, which cooperate therewith, necessarily have to be similar shaped whereby any transverse movement or displacement of the insert member 5 in the opening 3 relative to the body member 2 is prevented. The inner end of the insert member is preferably concave shaped or semi-circular, as at 6, so as to conform to the diameter of the conductor wire W with which it is adapted to be used. In other words, the inner end of the insert member is shaped to receive a part of the diameter of the conductor wire.

Both the side of the body member 2 and the outer end of the insert member 5, which are adapted to be disposed directly next to the support or post P, are preferably concave shape, as at 7, so that the body member together with the insert member will be seated firmly against the support when the insulator is attached thereto. The body member 2 and the insert member 5 are made preferably of any suitable insulator material, such as glass, porcelain, phenolic condensation products and the like.

The insulator of my invention is assembled in place on the support or post P with which it is adapted to be used in the following manner. The conductor wire W is placed in the transverse opening 3 of the body member so as to be positioned next to the inner end of the opening substantially centrally of the body member. The insert member 5 is then positioned in the opening 3 so that the concave portion 6 on the inner end thereof cooperates with the side of the conductor wire W directly opposite therefrom. The insulator is then positioned on the support or post P with which it is adapted to be used with the outer side of the insert member abutting thereagainst, and suitable attaching means, such as bolts or nails N, are inserted through the holes 4 and the insulator is securely attached to the support. As the body member 2 is being attached to the support or post by means of the bolts or nails, it will be seen that the insert member 5 is forced continuously into the opening 3 so that the conductor wire W is securely seated in the inner end of the opening 3 and firmly gripped between the same and the inner concave end portion 6 of the insert member 5, with the inner end of the opening 3 disposed around substantially one side or part of the diameter of the wire, and the concave portion 6 of the insert member 5 disposed around the opposite side or the other part of the diameter of the wire. It will be seen that the concave inner sides 7 of both the body member and the insert member are firmly seated against the support or post after the insulator has been completely assembled thereon.

It will be understood that the irregular or non-planar shaped sides of the insert member 5, which cooperate with correspondingly shaped sides of the opening 3, prevent transverse movement or displacement of the insert member from its assembled position in the opening, as in case the conductor wire W is subjected to longitudinal stresses.

In Figures 8 through 12 of the drawings, there is shown, a slight modification of the preferred form of insulator of my invention. In this construction, the insert member 5 instead of having a diamond-shaped cross section, has substantially an hour glass cross section with the sides of the opening 3 being correspondingly shaped so as to prevent transverse movement or displacement of the insert member from the opening in the body member.

There is shown in Figures 13 through 17, another modified arrangement of the insert member of the insulator of my invention. The insert member 5 in this construction is preferably wedge-shaped as before, but in order to prevent transverse movement or displacement of this member in the opening 3 of the body member, there is arranged preferably centrally of the insert member on either side thereof at least one rib portion 9 which cooperates with a similar shaped groove 10 arranged in either side wall of the opening 3 in the body member so as to provide substantially a tongue and groove arrangement.

In Figures 18 through 21, there is shown still another modified form of insulator of my invention. In this construction, the opposed side faces of the insert member 5 are preferably convex-shaped, as at 12, with the sides of the opening 3 in the body member with which they cooperate substantially concave-shaped, as at 13, so as to prevent the insert member from moving transversely or becoming displaced from the opening in the body member.

The insert member of these latter constructions, is positioned and assembled in the opening 3 of the body member, and the insulator attached to the support or post in exactly the same manner as before described for the preferred embodiment.

As a result of my invention, it will be seen that there is provided an insulator which can be conveniently and quickly attached to the support or post with which it is adapted to be used. At the same time, it will be seen that my improved insulator consists of a minimum number of parts which may be easily fabricated, without the need of expensive equipment. Finally, but not least, it will be seen that the improved insulator of the present invention firmly grips the wire conductor and securely and safely holds the same in its assembled position on the support with which it is to be used.

While I have shown and described several specific embodiments of my invention, it will be understood that these embodiments are merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

I claim:

1. An insulator of the class described for attaching a wire conductor to a supporting member comprising a body member having a transverse channel opening arranged on the inner side thereof which is adapted to be disposed next to the supporting member, a removable insert member arranged in said opening with the conductor adapted to be positioned in said opening between the inner side of the same and the inner side of said insert member, said insert member being constructed and arranged so that it can be inserted into said opening only from the inner side of said body member, means carried by said insert member which cooperates with means arranged on the side walls of said opening to prevent movement of said insert member in either direction along said opening, and means arranged in said body member for attaching the same to the supporting member, the inner side of said

insert member adapted to abut the supporting member and adapted to be forced into the opening into engagement with the conductor thereby when said body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member.

2. An insulator of the class described for attaching a wire conductor to a supporting member, as defined in claim 1, wherein the means carried by the insert member which cooperates with means arranged on the side walls of the opening in the body member to prevent movement of the insert member along said opening relative to the body member consists of non-planar surfaces arranged on either side of the insert member which cooperates with similar non-planar side walls of the opening.

3. An insulator of the class described for attaching a wire conductor to a supporting member, as defined in claim 1, wherein the means carried by the insert member which cooperates with means arranged on the side walls of the opening in the body member to prevent movement of the insert member along said opening relative to the body member consists of at least one rib portion arranged on either side of the insert member centrally thereof and extending longitudinally of the same which cooperates with a groove arranged in the side walls of the opening so as to provide a tongue and groove arrangement.

4. An insulator of the class described for attaching a wire conductor to a supporting member comprising a body member having a transverse channel opening arranged on the inner side thereof which is adapted to be disposed next to the supporting member, a removable insert member arranged in said opening with the conductor adapted to be positioned in said opening between the inner side of the same and the inner side of said insert member, said insert member being substantially hour glass in cross section so as to provide irregular shaped sides which cooperate with similar shaped side walls of the opening whereby movement of said insert member along said opening is prevented, and means arranged in said body member for attaching the same to the supporting member, the inner side of said insert member adapted to abut the supporting member and adapted to be forced into the opening into engagement with the conductor thereby when said body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member.

5. An insulator of the class described for attaching a wire conductor to a supporting member comprising a body member having a transverse channel opening arranged on the inner side thereof which is adapted to be disposed next to the supporting member, a removable insert member arranged in said opening with the conductor adapted to be positioned in said opening between the inner side of the same and the inner side of said insert member, said insert member being substantially diamond shaped in cross section so as to provide irregular shaped sides which cooperate with similar shaped side walls of the opening whereby movement of said insert member along said opening is prevented, and means arranged in said body member for attaching the same to the supporting member, the inner side of said insert member adapted to abut the supporting member and adapted to be forced into the opening into engagement with the conductor thereby when said body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member.

6. An insulator of the class described for attaching a wire conductor to a supporting member comprising a body member having a transverse channel opening arranged on the inner side thereof which is adapted to be disposed next to the supporting member centrally of the same, a removable insert member arranged in said opening with the conductor adapted to be positioned in said opening between the inner side of the same and the inner side of said insert member, said insert member being constructed and arranged so that it can be inserted into said opening only from the inner side of said body member, means carried by said insert member which cooperates with means arranged on the side walls of said opening to prevent movement of said insert member in either direction along said opening, said body member having a hole arranged therethrough on either side of said transverse opening through which a bolt or the like is adapted to be inserted for attaching the same to the supporting member, the inner side of said insert member adapted to abut the supporting member and adapted to be forced into the opening into engagement with the conductor thereby when said body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member after said member is securely attached to the support.

7. An insulator of the class described for attaching a wire conductor to a supporting member, as defined in claim 6, wherein the sides of both the body member and insert member adapted to be disposed next to the support is concave so as to seat properly and firmly on the supporting member.

8. An insulator of the class described for attaching a conductor to a supporting member comprising a body member having a transverse channel arranged in that side thereof adapted to be disposed next to the supporting member, means arranged in said channel and inserted thereinto from the inner side of said body member and which is adapted to cooperate with said body member to hold the conductor securely therein, means preventing movement of said first mentioned means in either direction along said channel, and means for attaching said body member to the supporting member, said first mentioned means adapted to abut the supporting member and adapted to be forced into engagement with the conductor thereby when the body member is attached thereto so that the conductor is gripped firmly between said means and said body member.

9. An insulator of the class described for attaching a conductor to a supporting member comprising a body member having an opening arranged therein in which the conductor is adapted to be disposed, an insert member positioned in said opening from the inner side of said body member and cooperating with the opening in said body member to hold the conductor securely in position therein and against movement relative thereto, cooperable means carried by said body member and said insert member preventing movement of said insert member relative to said body member in either direction along said opening, and means for attaching said body mem-

ber to the supporting member, said insert member adapted to abut the supporting member and to be forced into said opening into engagement with the conductor therein when the body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member.

10. An insulator of the class described for attaching a conductor to a supporting member comprising a body member having a central transverse channel arranged in that side thereof adapted to be disposed next to the supporting member, a wedge-like insert member positioned in said channel from the inner side of said body member and which is adapted to cooperate with said body member to hold the conductor securely therein, cooperable means carried by said body member and said insert member preventing movement of said insert member relative to said body member in either direction along said channel, and means arranged to each side of said channel and said insert member for attaching said body member to the supporting member, the side walls of said channel being tapered inwardly

and cooperating with the side walls of said insert member when the same is positioned in said channel, said insert member adapted to abut the supporting member and adapted to be forced wedgingly into the channel into engagement with the conductor therein when said body member is attached to the supporting member so that the conductor is gripped firmly between said insert member and said body member.

RUDOLPH A. MINARIK.

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