United States Patent

Wilson

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[54] SELF-SUPPORTING ELECTRIC FENCE POST INSULATOR

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[73] Assignee: **Dare Products, Incorporated,** Battle Creek, Mich.

[22] Filed: **June 4, 1970**

[21] Appl. No.: **43,468**

[52] **U.S. Cl.**.....**174/163 F,** 174/175, D26/10

[51] **Int. Cl.**.....**H01b 17/16,** A01k 3/00

[58] **Field of Search**.....174/45 R, 158 R, 158 F, 161 R, 174/161. F, 163 R, 163 F, 174, 175; 256/10; D26/10

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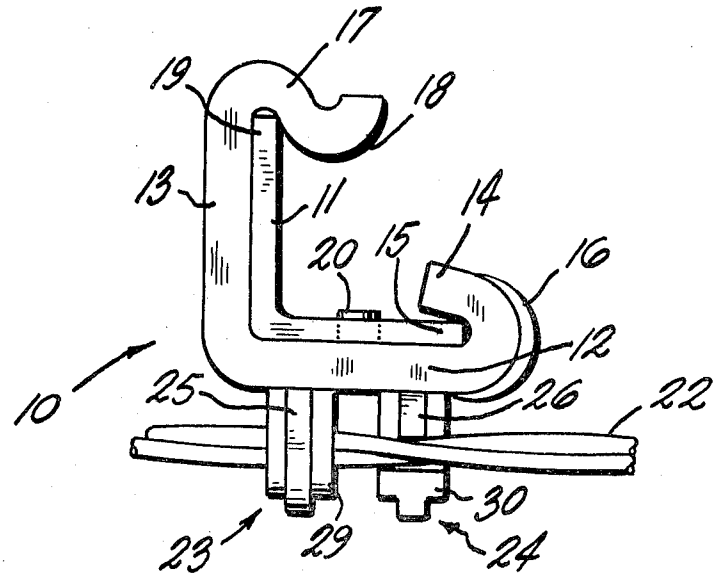
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Primary Examiner—Laramie E. Askin
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[57] **ABSTRACT**

An integral wraparound self-supporting electric fence post insulator is provided integrally molded of an electrically insulating material. The insulator is provided with integral hooks or clamps for attaching to the face edges of a fence post as, for example, a fence post having either an angle-shaped or T-shaped cross-section. An outer face of the insulator is provided with a pair of laterally spaced apart hooks, one having its jaw disposed upwardly and the other having its jaw disposed downwardly. The insulator may be readily mounted on a fence post by engaging its hooks or clamp edges around the free edges of the fence post. A fence wire which is to be electrically charged is then placed in the channel defined by the two hooks, where it will be permanently retained in a condition insulated from the fence post.

11 Claims, 11 Drawing Figures



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SHEET 1 OF 2

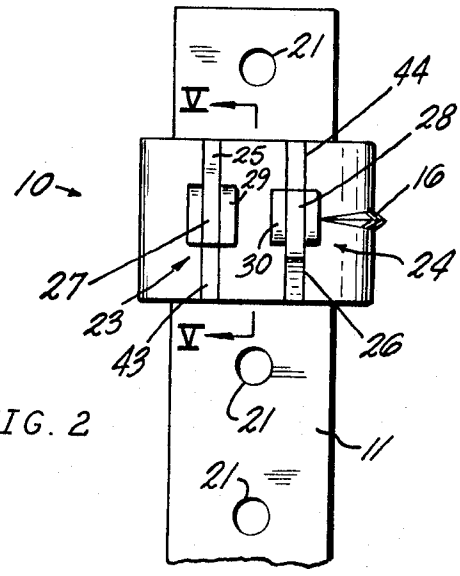


FIG. 2

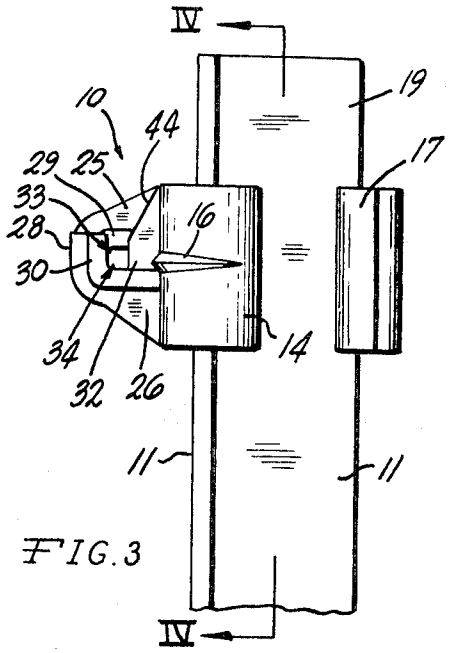


FIG. 3

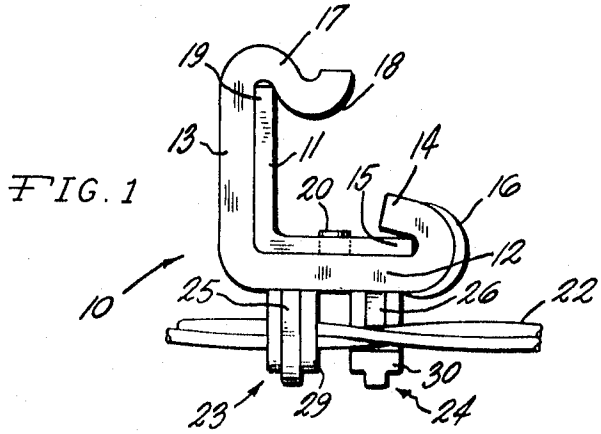


FIG. 1

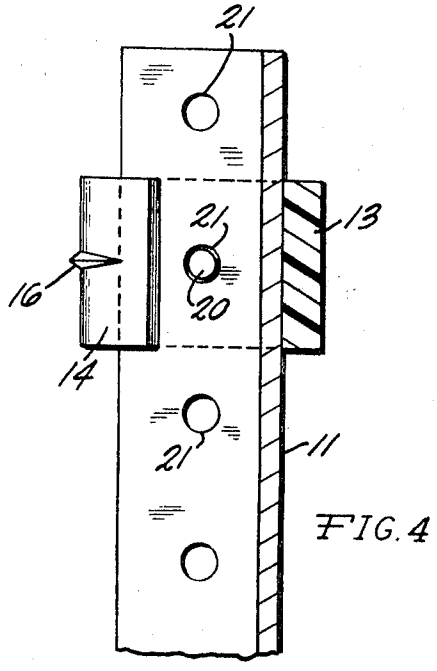


FIG. 4

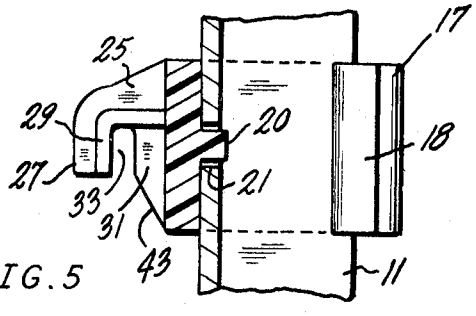


FIG. 5

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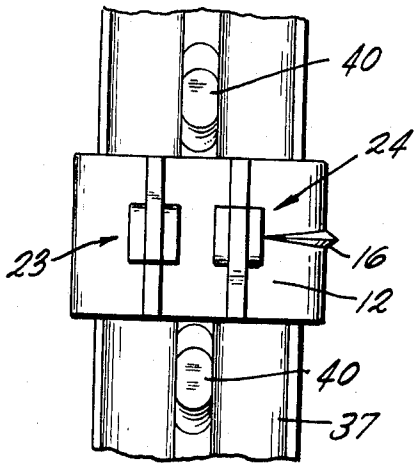


FIG. 7

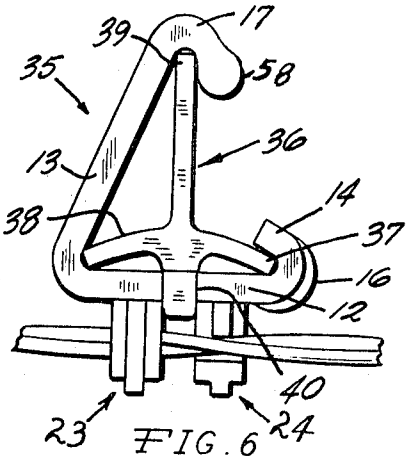


FIG. 6

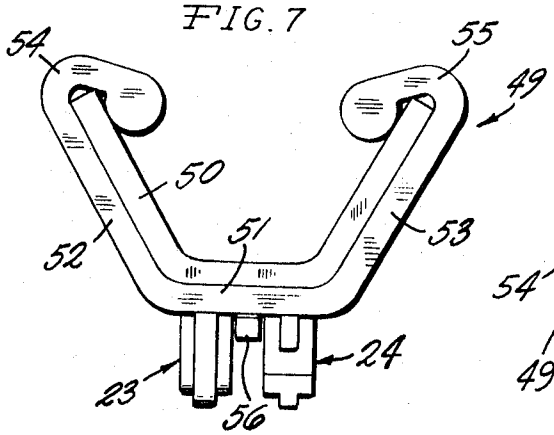


FIG. 8

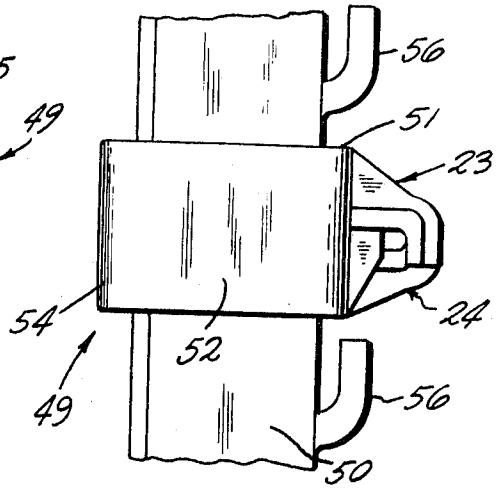


FIG. 9

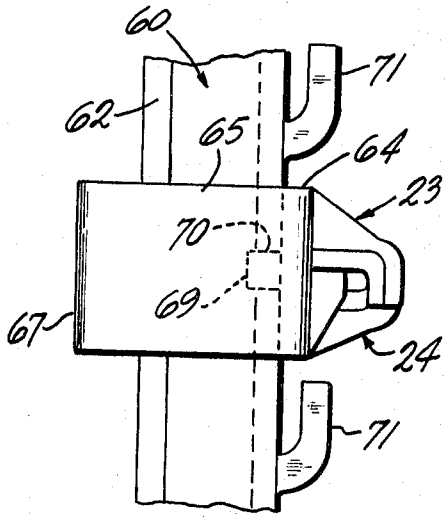


FIG. 11

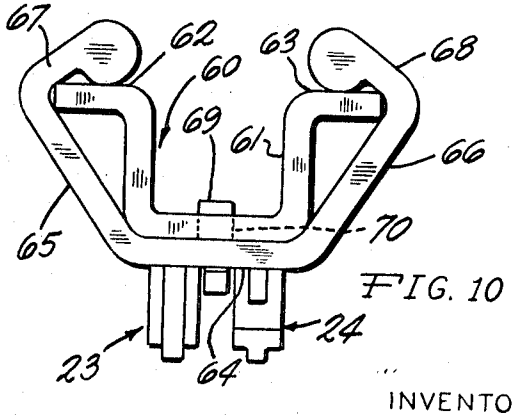


FIG. 10

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SELF-SUPPORTING ELECTRIC FENCE POST INSULATOR

BACKGROUND OF THE INVENTION

The present invention deals broadly with insulators, particularly insulators suitable for use in supporting electrically charged wires in a position where the wire is insulated from the ground and from the metal fence post which supports the wire. Such fence posts are generally formed of vertical flanges or plates having cross-sections as for example, angle-form, T-form, U-form or arcuate, and having at least two lateral edges. Insulators for such fence posts are well-known in the art. However, they have many drawbacks, in that they are generally cumbersome, expensive to produce, and thus easily become fouled with debris which may become conducting during a rainstorm and short out the current being conducted through the fence. This is particularly true of those insulator arrangements which utilize a wraparound wire or clip to support the electrical wire on the insulator.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an insulator for supporting electrically charged wires on a metal fence post, which insulator is readily secured to a standard post.

It is an additional object to provide an insulator which, after it has been mounted on a post remains permanently affixed to the post, even during the rather drastic weather conditions sometimes encountered.

It is a further object to provide an insulator which does not require a loop or clip of wire for mounting the insulator or supporting the electrical wire, thereby avoiding the possible entrapment of debris which could short out the current applied to the electrical wire.

It is still further an object to provide an insulator having mounting means for an electrical wire which securely maintains and supports the wire in proper position.

It is still an additional object to provide an insulator which is relatively simple and inexpensive to manufacture.

Still further objects and advantages of the invention will appear as the description proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

To the accomplishment of the foregoing and related ends, the invention, then, consists of a wraparound insulator which may be permanently mounted on a standard electrical fence post without the need of auxiliary mounting aids such as wires or clips, and which, when so mounted, provides positive insulating support for an electrically charged wire mounted thereon, as herein fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain illustrative embodiments of the invention, such disclosed embodiments illustrating, however, but several of the various ways in which the present invention may be used.

In the annexed drawings:

FIG. 1 is a top view showing the insulator of the present invention mounted on an angle-shaped post, and supporting an electrical wire.

FIG. 2 is a front elevation of the insulator mounted on the fence post shown in FIG. 1.

FIG. 3 is a side elevational view of the fence post and insulator mounted thereon.

FIG. 4 is a cross-sectional view taken at the line IV—IV of FIG. 3, looking in the direction of the arrows.

FIG. 5 is a cross-sectional view taken at the line V—V of FIG. 2, looking in the direction of the arrows.

FIG. 6 is a top view showing the insulator of the invention mounted on a T-shaped fence post.

FIG. 7 is a side elevational view of the embodiment shown in FIG. 6.

FIG. 8 is a top view showing an insulator according to the invention designed to be used with a heavy duty fence post having a U-shaped cross-section.

FIG. 9 is a side elevational view of the embodiment shown in FIG. 8.

FIG. 10 is a top view of an insulator according to the invention designed to be mounted on a fence post having a U-shaped cross-section with lateral flanges; and

FIG. 11 is a side elevational view of the embodiment shown in FIG. 10.

DESCRIPTION OF THE SPECIFIC EMBODIMENTS

Referring more particularly to FIGS. 1, 2 and 3, the insulator 10 is shown generally mounted on a fence post 11, in this particular case having an angle-shaped cross-section, as shown particularly in FIG. 1. The insulator 10 is integrally molded from a flexible plastic material, as for example linear polyethylene, and comprises a frontal web 12 having a lateral web 13 connected thereto. A frontal hook 14 is formed at the end of the frontal web 12 by bending over the edge thereof, and engages a free edge 15 of the fence post 11. A reinforcing rib 16 strengthens the hook 14, retains it in position, and prevents it from being bent and thereby releasing the edge 15 of the fence post. The rib 16 is also integrally molded with the insulator. The lateral web 13 is connected to the frontal web 12 and is provided at its end with a lateral hook 17 having a reverse curve 18 for facilitating latching over the free edge 19 of the fence post 11. A pin, lug or boss 20 is also integrally molded with the insulator and engages a hole 21 provided in the fence post, thereby preventing vertical movement of the insulator 10 (FIGS. 1, 4 and 5).

In order to support an electrical wire 22, shown in FIG. 1, the insulator is provided with a pair of generally L-shaped hooks 23 and 24 having horizontal arms 25 and 26, respectively, extending from the frontal web 12, and vertical arms 27 and 28 extending downwardly and upwardly from the horizontal arms 25 and 26, respectively. The hooks 23 and 24 are provided with reinforcing L-shaped flanges 29 and 30, respectively. Supporting webs 31 and 32 (FIGS. 3 and 5) cooperate with the horizontal arms 25 and 26 and with the vertical arms 27 and 28, respectively, to define a pair of slots or jaws 33 and 34 which are spaced apart from the outer surface of the frontal web and maintain the supported electrical wire also in spaced apart position. The webs 31 and 32 are beveled to provide a pair of ramps 43 and 44 which serve to guide the wire into the slots 33 and 34, respectively, (FIGS. 3 and 5).

Referring to FIG. 6, an insulator 35 according to the invention is shown mounted on a fence post 36 having a T-shaped cross-section. In this embodiment, the hook 14 engages the free edge 37 of the frontal flange of the post and the frontal web 12 engages the frontal plate 38 of the post. The hook 17 having an enlarged end 58 engages the free edge 39 of the perpendicular flange. The supporting hooks 23 and 24 are constructed and operate in the same manner as described above in connection with the earlier figures, although it may be necessary to change the dimensions of the webs 12 and 13 to compensate for the altered dimensions of the arms or flanges of the T-shaped post. Since T-shaped posts conventionally are provided with studs 40, the present insulators may be mounted intermediate a pair of studs, which studs engage the edges of the insulator and prevent vertical movement. For such an application the webs are therefore not provided with studs 20, shown in FIG. 1.

FIGS. 8 and 9 illustrate an insulator 49 designed to be utilized with a U-shaped fence post, the insulator being shown mounted on such a fence post 50. The insulator 49 comprises a frontal web 51 supporting a pair of wire supporting hooks 23 and 24 identical to those shown in FIGS. 1–3. Lateral webs 52 and 53 are connected to the frontal web 51, and are provided at their ends with hooks 54 and 55, respectively, engaging the free lateral edges of the fence post 50. The fence post 50 is normally provided with hooks 56 stamped from the central portion thereof, which may be utilized to support the insulator vertically.

FIGS. 10 and 11 illustrate still another embodiment of the invention designed to be mounted on a U-shaped fence post of

a somewhat modified form. As shown in FIG. **10**, the fence post **60** has a U-shaped body **61** and lateral flanges **62** and **63**. The insulator body has a frontal web **64**, lateral webs **65** and **66**, fence engaging hooks **67** and **68** provided at the ends of the lateral webs **65** and **66**, respectively, and wire engaging hooks **23** and **24** identical to those shown in FIGS. **1–3**. Additionally, a stud **69** is provided at the rear surface of the frontal web **64**, engaging one of a series of holes **70** provided in the fence post, in order to obtain vertical restraint. Alternatively, the insulator may be mounted against a hook **71** conventionally provided in such fence posts.

In mounting the insulator of the present invention, with respect to the angle-shaped fence post or T-shaped fence post, the hook **14** is first applied to free edge **15** or **37**, positively engaging that edge of the fence post. The front web **12** is then placed in engagement with the front plate of the fence post, and the web **13** wrapped around the corner. The hook **17** is then forced around the edge of the fence post **19** or **39**. The resilience of the material causes the hook **17** to snap into place, retaining the insulator in positive engagement with the fence post. The insulators shown in FIGS. **8–11** are similarly mounted. First one hook such as **54** or **67** is mounted over the free lateral edge of the respective fence posts **50** or **60**. The insulator is then wrapped around the face of the fence post and the other hook **55** or **68** then snapped into place over the other free lateral edge of the respective fence posts. Where holes are provided in the fence posts, as for example **70**, the insulators are so positioned that a lug **69** provided at the inner face of the frontal web engages the hole. Where such lug is not p rovided, the insulator may be mounted against hooks **56** or **71**, which hooks are normally provided in this type of fence post. Either method of mounting provides adequate vertical restraint.

The electrical wire engaging hooks of all the insulators illustrated in the drawings are identical. In mounting an electrical wire **22** in the hooks, a portion of the wire is positioned almost vertically and inserted between the two hooks **23** and **24** and then turned toward a horizontal position. As the wire is turned it engages the ramps **43** and **44** which urge the wire outwardly until it is engaged by the slots **33** and **34**. As long as the wire remains in a taut horizontal position, it cannot be disengaged from the slots, since the horizontal arms provide vertical restraint and the vertical arms provide horizontal restraint. Only by loosening the wire and again placing a segment thereof in an almost vertical position can the wire be disengaged from the hooks. The hooks of the present invention thereby provide positive support for the electrically charged wires and maintain them in insulated condition with respect to the fence post, and spaced apart from the face of the frontal web. This is particularly important with respect to modern practice where higher voltages are utilized than was previously the case. With the use of such electrical currents of as high as 2,000 volts or more, the insulation problem becomes critical, particularly when the insulator becomes wet. Under such unfavorable conditions the narrow webs of the present invention hold the electrical current carrying wire at a distance from the post and the main body of the insulator, and thus provide a long narrow path for the current and thereby prevent short circuits.

The present insulator is fabricated from a material which is electrically insulating, and which is sufficiently stiff so that when it is clamped onto a fence post, it remains strongly affixed thereto. However, it must also have some resilience so that the hooks can be snapped over the face edges of the fence post. Suitable materials are linear polyethylene, polypropylene, polyvinyl chloride, polyurethanes, polyesters, phenolics, natural and synthetic rubbers, polycarbonates, et cetera.

The electrical fence post insulator of the present invention has a number of features which render it superior to prior art devices of the general type. First, it provides an insulator which may be readily clamped to a fence having at least two free edges, and, when so clamped, is self-supporting without the need for additional fastening means such as wire clips. The insulator remains fixed in place over long periods of time and even under the stress of adverse weather and other conditions encountered during normal use. The insulator is provided on its front face with a pair of hooks in which a wire may be readily inserted before the wire is made taut. However, once the wire is mounted on adjacent insulators and pulled taut, the hooks so cooperate as to make it impossible for the wire to be dismounted. This is due to the manner in which the downwardly positioned hook and the upwardly positioned hook cooperate to provide a channel which is positively engaging as long as the wire remains taut and horizontally arranged. Only by loosening the wire and positioning it almost vertically can it be removed from the hooks. The insulator provides excellent insulating properties and structure and avoids short circuiting even under adverse conditions. Further, the entire insulator may be integrally molded from relatively inexpensive plastic materials and with standard molding procedures and equipment.

While several forms of the invention have been shown and described, other forms will now be apparent to those skilled in the art. Therefore, the embodiments of the self-supporting electric fence post insulator shown in the drawings are merely for illustrative purposes, and are not intended to limit the spirit and scope of the invention as above described and illustrated. It is further to be noted that while directional terms have been used, same are not to be construed as a limitation of the invention since such use has been availed of to better describe the invention in the various positions shown in the drawings.

Other modes of applying the principle of my invention may be employed, instead of those explained, change being made as regards the electric fence post insulator and combinations herein disclosed, provided the means and features stated by any of the following claims or the equivalents of such stated means or features be employed.

I therefore particularly point out and distinctly claim as my invention:

1. An integral insulator formed of a resilient plastic material and adapted to be mounted on a flange-form fence post having at least two free edges and when so mounted to support an electrically conductive wire in insulated condition from said fence post, said insulator being self-supporting on said fence post without auxiliary fastening means while supporting said wire and comprising a frontal web having hook means associated with both lateral edges thereof, each hook means being adapted to engage a free edge of said fence post, for thereby clamping said insulator to said fence post, and a pair of laterally spaced apart wire supporting hooks extending forwardly from the outer surface of said frontal web, said wire supporting hooks each comprising a laterally extending arm and a vertically extending arm connected thereto, the vertically extending arm of one hook being directed downwardly and the vertically extending arm of the other hook being directed upwardly, the end of said downwardly directed arm being positioned lower than the end of said upwardly directed arm, each wire supporting hook being provided with a web extending transversely to said frontal web and cooperating with the vertical arm of said hook to form a slot spaced apart from the outer face of said frontal web and adapted to retain and support an electrical wire in said spaced apart position.

2. An insulator according to claim **1**, wherein one edge of said frontal web is turned over to provide a hook adapted to engage one free edge of said fence post, and wherein a second web is connected to said frontal web and disposed at an angle thereto, said second web being turned over at its free edge to form a hook adapted to engage another free edge of said post, for thereby clamping said insulator to said post.

3. An insulator according to claim **2**, wherein each of said webs cooperating with a vertical arm of a hook is beveled to provide a ramp adapted to guide said wire into said slots when said wire is inserted between said hooks and moved into horizontal position.

4. An insulator according to claim 2, wherein said wire retaining hooks are each provided with an L-shaped lateral flange for reinforcing said hooks and providing an extended bearing surface to support said wire in highly insulated condition.

5. An insulator according to claim 2, adapted to be mounted on a fence post having an angle-shaped cross-section and holes provided in the mounting face thereof, the rear surface of one of the webs of said insulator being provided with a stud adapted to engage one of said holes, for thereby preventing vertical movement of said insulator on said fence post.

6. An insulator according to claim 2, wherein the hook formed at the end of said frontal web is of U-shaped configuration and is provided with an elongated reinforcing rib conforming to said U-shaped configuration to thereby strengthen and stiffen said hook.

7. An integral insulator formed of a resilient plastic material and adapted to be mounted on a fence post having a U-shaped cross-section and when so mounted to support an electrically conductive wire in insulated condition on said fence post, said insulator being self-supporting on said fence post without auxiliary fastening means while supporting said wire and comprising a frontal web, a pair of lateral webs connected one at each side of said frontal web, and hook means provided at the free ends of each of said lateral webs adapted to engage the free edges of said fence post for thereby clamping said insulator to said fence post, and a pair of laterally spaced apart wire supporting hooks extending forwardly from the outer surface of said frontal web, said wire supporting hooks each comprising a laterally extending arm and a vertically extending arm connected thereto, the vertically extending arm of one hook being directed downwardly and the vertically extending arm of the other hook being directed upwardly, the end of said downwardly directed arm being positioned lower than the end of said upwardly directed arm, each wire supporting hook being provided with a web extending transversely to said frontal web and cooperating with the vertical arm of said hook to form a slot spaced apart from the outer face of said frontal web and adapted to retain and support an electrical wire in said spaced apart position.

8. An insulator according to claim 7, wherein each of said webs cooperating with a vertical arm of a hook is beveled to provide a ramp adapted to guide said wire into said slots when said wire is inserted between said hooks and moved into horizontal position.

9. An insulator according to claim 8, wherein said wire retaining hooks are each provided with an L-shaped lateral flange for reinforcing said hooks and providing an extended bearing surface to support said wire in highly insulated condition.

10. An insulator according to claim 7, adapted to be mounted on a fence post having holes provided in the mounting face thereof, the rear surface of one of the webs of said insulator being provided with a stud adapted to engage one of said holes, for thereby preventing vertical movement of said insulator on said fence post.

11. An insulator according to claim 7, wherein the hooks formed at the ends of said lateral webs are of U-shaped configuration and are provided with elongated reinforcing ribs conforming to said U-shaped configuration thereby strengthening and stiffening said hooks.

* * * * *