Feb. 8, 1955 H. J. MARTH 2,701,820

STAND OFF INSULATOR

Filed June 22, 1953

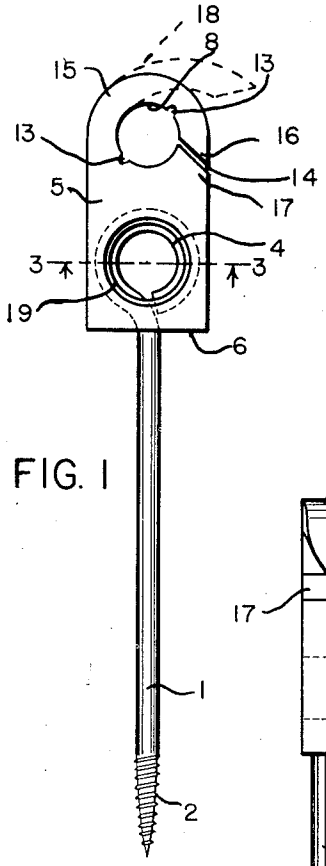

FIG. 1

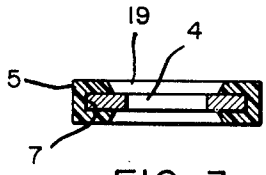

FIG. 3

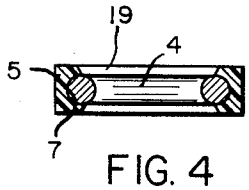

FIG. 4

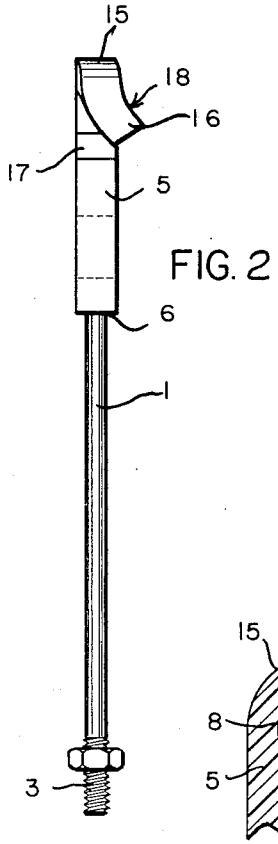

FIG. 2

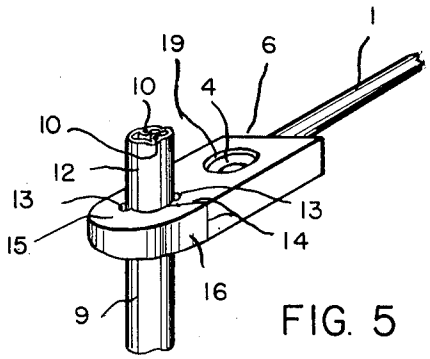

FIG. 5

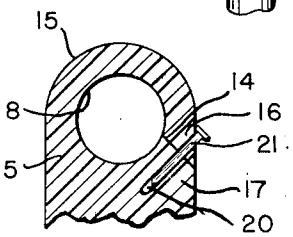

FIG. 6

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STANDOFF INSULATOR

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4 Claims. (Cl. 174—164)

This invention relates to insulators and has special reference to so-called stand-off insulators which are used to support antenna lead-in wires, cables, or the like in spaced relation to the antenna mast and/or the building on which the antenna is mounted.

Television is now generally accepted by the public and television sets are being sold and installed in great numbers each day. Most of the television installations require an outside antenna in order to be able to pick up a strong enough signal to operate satisfactorily, especially when the installation is any distance from the transmitter. Each of these outside antenna installations requires a lead-in wire running from the antenna to the receiver, and this lead-in wire must be so installed as to be spaced a predetermined minimum distance from the mast and the building along and over which it runs. Stand-off insulators are used for this purpose.

There are on the market stand-off insulators which may be clamped on an antenna mast and others which may be screwed into wooden buildings, or otherwise secured in place. These insulators usually comprise a length of metallic wire or rod having mounting means (such as a clamp, screw thread, or the like), at one end thereof, and the opposite end being formed to an eye, in which an insulator is carried to insulator being perforated axially of the metallic eye to receive the lead-in wire. In this construction, the metallic eye surrounds the lead-in wire. In this construction, the metallic eye surrounds the lead-in wire and a capacity reactance occurs which reduces the ability of the lead-in to transmit the signal to the receiver from the antenna. U. S. Patent No. 369,447 discloses an insulator similar to some of those now in use for the purpose above mentioned and which has the adverse effect on the signal transmission.

With the advent of V. H. F. television conventional insulators such as the type shown in the patent were acceptable and provided adequate efficiency for normal installations. However, with the present introduction of U. H. F. television, the conventional insulators are not adequate and much signal strength is lost while it is being transmitted between the antenna and the receiver. Special lead-in cable or wire of a different characteristic than V. H. F. antenna lead-in is required for U. H. F. antenna lead-ins to obtain maximum efficiency in the transmission of the signal between antenna and receiver, and when conventional stand-off insulators are used, much more of the signal strength is lost between antenna and receiver in U. H. F. than in V. H. F.

Another disadvantage of conventional stand-off insulators used in TV installations is that they require a great deal of installation time, that is, the technician installing the TV receiver must spend a great deal of his time installing the antenna lead-in wire. The reason for this is that TV lead-in wires are usually relatively wide in diameter (they are usually tubular in cross section with a single pair of wires, the wires being carried on opposite sides of the tube), and the metal eyes of the stand-off insulators must be spread apart or opened up with a special tool, after the insulator is screwed or clamped in place. The insulator is then removed and installed on the lead-in. The insulator is then replaced in the opened eye and the latter is clamped or bent to closed position again, with a special tool developed for the purpose. In a single antenna installation as few as 12 to 15 or as many as 50 or more stand-off insulators may be required, and the time element involved in the installation of each insulator becomes very important. It may even take several hours to install a single lead-in when things don't go just right such as when the special tools are worn, out of adjustment or the like and do not function properly, or in adverse weather conditions where cold/or wet hands, tools and equipment make working difficult. Of course, this lead-in installation is annoying to installers as well as time consuming and expensive, especially when a large number of insulators are required in an installation.

It is, therefor, one of my principal objects to provide an improved stand-off insulator for TV antenna lead-ins and the like which will provide materially improved transmission of a signal from antenna to receiver.

Another of my principal objects is to provide such an insulator which will materially reduce the time and labor required for its installation on the lead-in.

Another object is to provide an insulator of the character described which has an improved means for inserting the lead-in wire into its retaining collar in a simple, quick, and secure manner.

Another more specific object is to provide a stand-off insulator which can be quickly and easily securely mounted on the antenna mast or on a building in the same manner as conventional insulators, but which eliminates the signal loss which is present in conventional insulators.

Another object is to provide such an insulator which is simple and inexpensive to manufacture and sell.

These and other objects and advantages of my invention will become more apparent as the description proceeds.

In the accompanying drawing forming a part of this application.

Figure 1 is an elevational view of an insulator embodying my invention and having a screw thread at the lower end thereof to be installed into wood or the like.

Figure 2 is an edge view of the device such as the one shown in Figure 1 but having a machine screw thread on its lower end so that conventional mounting clamps may be used to mount same on an antenna mast or the like.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3 showing a slightly modified form of the invention.

Figure 5 is a fragmentary perspective view showing the device in use.

Figure 6 is an enlarged longitudinal sectional view showing a means for securing the lead-in within the holding ring.

In the drawings, the reference numeral 1 indicates a metallic wire or rod which forms the body of my stand-off insulator, the body being provided at its lower end with suitable means such as the wood screw thread 2 or machine screw thread 3, for mounting same on a support. This mounting means is conventional as regards stand-off insulators.

The body member 1 may be of any suitable length, of course, and is preferably straight, as shown, throughout the major portion of its length, and is usually circular in cross section.

The upper end of the body member is bent to form an eye 4 of relatively small diameter to receive the end of a screwdriver or similar instrument for rotating the body on its longitudinal axis for threading the body securely in its mounting, not shown, such as a wooden support or conventional mounting brackets.

The eye 4 may be flattened as shown in Figure 3, or it may be left unflattened as in Figure 4, of course, however, the flattened eye of Figure 3 is more desirable because it will reduce the thickness of the lead-in support and require less material for the manufacture of the completed units.

As shown in the drawings, I have provided a head member or lead-in support 5 which is mounted on the eyed end of the body member, the eye 4 serving as the mounting or support to receive and carry the

head member on the end of the body member in addition to serving as a grip for turning or rotating the body when mounting or installing same on its support. The head, or lead-in support, is carried in outwardly extended relation to the eye 4, as shown, and is made of suitable insulating material, such as plastic or the like. The insulator material preferably is somewhat flexible, the purpose of which will become apparent.

The head 5 may be molded directly on the eye 4, or it may be moulded separately and installed on the eye in any suitable manner, such as by a suitable longitudinal slit or opening 7 into the head 5 through the inner edge 6 to permit the eye to be inserted into the head. Suitable cement or other fastening means could be provided to secure the head securely in place on the eye 4.

The head 5 has an opening 19 laterally therethrough concentric with the opening of the eye 4 and slightly larger than the latter. The opening 19 may be spaced outwardly from the opening in the eye and may have sloping edges as shown whereby a screw driver or similar tool, may be inserted readily through the eye 4 without damaging or otherwise effecting the insulating material of the head 5 when the tool is turned to rotate the body 1 as above pointed out.

The head 5 extends outwardly from the eye 4 a substantial distance, as shown, whereby an opening 8 may be provided therethrough in spaced relation to the eye 4, the opening 8 serving to receive and carry the lead-in cable 9 therethrough as shown in Figure 5. The lead-in wire usually comprises a tubular body 12 of insulating material of substantially circular cross section, as shown with a pair of wires 10—10 mounted in diametrically opposed relation to each other. In some makes of cable the wires 10—10 are carried inside of the tubular body and in others the wires 10—10 are carried on the outside surface of the body, not shown. In order to provide for the reception of either of the common TV lead-in cables, I have made diametrically opposed notches 13—13 in the edges of the opening 8 to receive the wires 10—10 and whereby the lead-in cable will be firmly received and held in the eye or opening 8.

To facilitate the installation of the lead-in cable into the eye or opening 8, I have provided a slit 14 thru the ring 15 of insulating material surrounding the opening 8, the slit being disposed at a diagonal from the opening 8 through the outer edge of the ring 15, rather than being radially located relative to the opening 8.

As stated above, the head 5 is made of such insulating material that is flexible. The flexibility being to a sufficient degree whereby the eye 8 may be opened by bending the free end 16 of the ring adjacent to the outer edge of the slot outwardly and even laterally away from the opposite side 17 of the slit 14 as at 18. This bending of the ring can be done by hand, of course, and will obviously open the eye 8 so that the lead-in cable may be easily inserted. When the cable is in place the ring may be released from its bent position and returned to normal position, surrounding the lead-in cable.

The portions 16 and 17 of the slit may be cemented together in order to securely lock the cable in the eye 8.

In Figure 6 I have shown a means for holding or locking the ring 5 in closed position wthout cement, after the lead-in cable has been installed in the opening 8. This means comprises a hole 20 formed in the head 5 and extending through the end portion 16 and into the end portion 17 of the ring, preferably at substantially right angles to the slit 14, as shown. A pin 21 may be inserted into the hole 20 to hold the slit closed and thereby prevent the cable from being accidentally released from the ring.

As is deemed apparent, from the above, the complete installation of a lead-in cable can be made in materially less time using my invention than can be expected using the conventional stand-off insulators, and there is no difficult or annoying procedure involved. The mounting of the cable is equally as secure as in conventional installations.

In addition to the above, there is no metallic ring surrounding the cable which will cause a capacity reactance which will reduce the ability of the cable to transmit the full signal strength along through the insulator. As stated, the adverse capacity reactance on the transmission of the TV signal increases materially as the frequency of the signal increases. In U. H. F. installations, the effect is very substantial and because of the large number of these insulators required, the overall loss of signal strength is great in the conventional lead-in installation.

My above described invention overcomes the installation as well as the signal transmission difficulties of stand-off insulators.

Having thus described my invention, what I claim is:

1. A stand-off insulator for supporting a lead-in wire or the like comprising an elongated metallic body member, means at one end of said member for mounting same on a support, a head carried at the opposite end of said body member, said head being of insulating material and having a portion thereof extending beyond said opposite end of said body member, said head having an opening transversely therethrough forming a ring to receive said wire and hold same in spaced relation to said metallic member to prevent electrical disturbance in said wire by said body member, and means to permit the insertion of said wire into said transverse opening comprising a slit extending through one side of said ring, said head being of flexible material to permit its distortion in shape to permit said insertion.

2. A stand-off insulator for supporting a lead-in wire comprising an elongated metallic body member, means at one end of said body member for mounting same on a support, an enlargement formed at the opposite end of said body member of the material of said body member, a head on said opposite end and carried by said enlargement, said head being of insulating material and having a substantial portion thereof extending beyond the end of said enlargement, said head having an opening therethrough in spaced relation to said enlargement to receive said wire and hold same in spaced relation to said metallic member to prevent electrical disturbance in said wire by said body member, and means for permitting the insertion of said wire into said opening in said head comprising a slit extending from said opening through one side of said head, said head being of flexible material to permit its being distorted in shape to permit said insertion.

3. A stand-off insulator for supporting a lead-in wire comprising an elongated metallic body member, means at one end of said body member for mounting same on a support, an enlargement formed at the opposite end of said body member of the material of said body member, a head on said opposite end and carried by said enlargement, said head being of insulating material and having a substantial portion thereof extending beyond the end of said enlargement, said head having an opening therethrough in spaced relation to said enlargement forming a ring to receive said wire and hold same in spaced relation to said metallic member to prevent electrical disturbance in said wire by said body member, and means to permit the insertion of said wire into said opening in said head, comprising a slit formed through said ring and extending from said opening at an angle through one outer edge of said ring, said head being of flexible insulating material to permit said ring to be distorted in shape to spread said slit far enough to permit said wire to pass into said opening of said ring.

4. The structure as set forth in claim 3 and said slit being adapted to be secured in closed position after said wire is in place in said opening.

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