May 17, 1960 J. KAMINSKI, JR., ET AL 2,937,225

CONDUCTOR SPREADER

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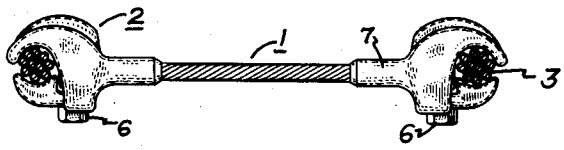


Fig. 1.

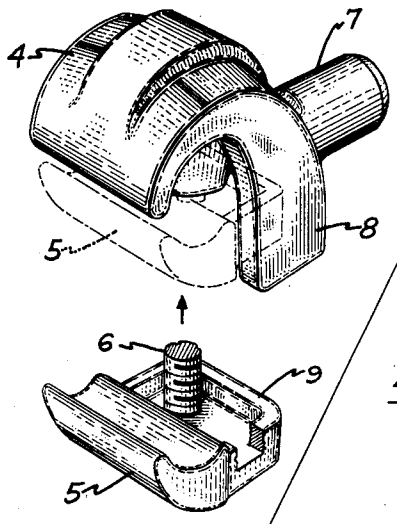


Fig. 2.

Fig. 3.

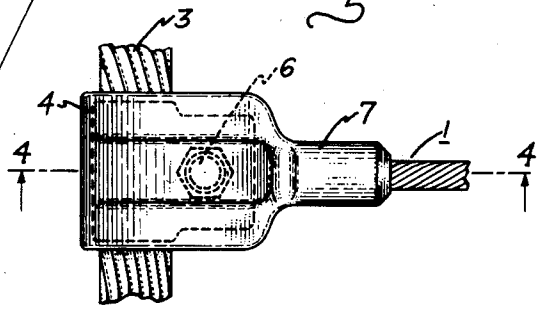


Fig. 4.

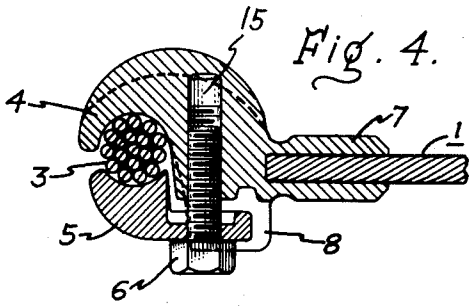
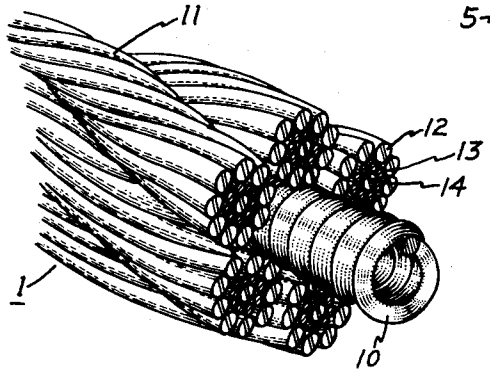


Fig. 5.



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CONDUCTOR SPREADER

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2 Claims. (Cl. 174—40)

This invention relates to a conductor spreader, and more particularly, to a spreader for spacing the conductors of a high voltage transmission line installation which utilizes a pair of conductors for each phase of electrical energy.

A successful conductor spreader should meet several requirements. The spreader should keep the conductors separated from each other so that they will not be twisted together when whipped about by high winds. However, the conductors should not be rigidly separated from each other but the spreader should be flexible enough to permit some limited movement of the conductors so that they can behave as individual conductors. Furthermore, the spreader should be self-restoring to its original condition prior to having been bent, twisted or vibrated.

Additional requirements are that the spreader utilize a relatively small number of separate parts so that it will be low cost and easy to assemble. The spreader preferably should have no loose parts which are apt to fall while the spreader is being installed, and also the spreader should be lightweight so that it will place as little extra load on the conductors as possible. Also, the spreader should have no loose or sliding joints which can rattle and cause wear as a result of conductor vibration.

It is an object of this invention to provide an improved conductor spreader which will satisfy the above-mentioned requirements.

In the preferred form of the invention the spreader comprises a stranded cable which has a pair of conductor clamps connected to its opposite ends. The stranded cable has a central core member which comprises a spring having closely adjacent or axially superposed turns which coil continuously and lengthwise of the cable. This central core member imparts very good self-restoring action on the cable. Each of the conductor clamps comprises only three separate elements. The three separate elements comprise a pair of clamping elements and a bolt for connecting the clamping elements together about the conductor. Additionally, the pair of clamping elements are constructed from a lightweight material such as aluminum or aluminum alloy. The clamps are connected to the opposite ends of the stranded cable by compressing the aluminum about the stranded cable so that some of the aluminum flows between the strands of the cable.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which we regard as our invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawing in which:

Fig. 1 is an elevation view of a preferred form of our invention; and

Fig. 2 is an enlarged and exploded perspective view of one of the clamps; and

Fig. 3 is a top view of one of the clamps; and

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 3; and

Fig. 5 is an enlarged and partly broken away perspective view of the stranded cable.

As illustrated in the drawing, the preferred form of the invention comprises a stranded steel cable 1 which has a pair of conductor clamps 2 connected to its opposite ends. The conductor clamps 2 are adapted to be clamped about a pair of spaced and generally parallel electrical conductors 3. In a high voltage electrical transmission line installation which utilizes a pair of conductors for each phase of electrical energy the pair of conductors typically are disposed horizontally in a horizontal or vertical plane.

The conductor clamps 2 comprise the pair of clamping members 4 and 5 and a single bolt 6. The bolt 6 passes through an aperture formed in the member 5 and into a threaded bore 15 formed in the member 4. The threaded bore 15 in member 4 preferably is a blind bore and the opposite end of the bolt does not protrude through the member 4. If the opposite end of the bolt 6 protruded through the member 4 it would comprise an exposed sharp surface which might be a source of corona and radio interference.

In our invention we prefer to make both of the elements 4 and 5 from a lightweight material such as aluminum or aluminum alloy. However, if the member 5 is not made from a lightweight material a considerable weight reduction may be achieved by making only the member 4 from a lightweight material since the member 4 comprises the major portion of the conductor clamp.

The member 4 has an integral tubular extension 7 formed thereon. The opposite ends of the stranded steel cable 1 fit into the tubular extensions 7 and the tubular extensions 7 are compressed about the stranded cable by crimping or the like. This form of compression clamping of the conductor clamps to the cable 1 causes some of the aluminum to flow between the strands of the cable 1. In this manner a very firm connection is obtained between the clamps and the cable. The tubular extensions 7 can be compressed about the cable 1 by a suitable hand compression tool. The bolts 6 need not be made from aluminum or aluminum alloy in order to obtain a substantial weight reduction since the bolts 6 comprise a very small portion of the conductor clamps.

Since the members 4 and 5 are constructed from a lightweight material they can be made larger than would be practicable with heavier materials such as iron. If the members 4 and 5 can be made larger this means that they can be provided with larger clamping areas which will reduce the unit clamping pressure on the electrical conductors 3. Additionally, by making the members 4 and 5 larger they will be less apt to present sharp surfaces which would constitute sources of corona since they can be gradually curved and rounded off. Aluminum provides an additional advantage in that eddy current and hysteresis losses usually associated with ferrous materials are eliminated.

The members 4 and 5 are provided with integral interlocking portions such as the parts 8 and 9 respectively. This means that the members 4 and 5 are prohibited from moving or sliding with respect to each other and rattling or causing conductor wear even though a single bolt is utilized to connect them together about the conductors. By utilizing a blind bore 15 in the member 4 for the bolt 6 the bore is kept clean and the threaded end of the bolt 6 is protected from the elements, and the necessity for a nut for the threaded end of the bolt 6 is eliminated.

The stranded cable 1 has a central core member 10 which imparts very good self-restoring characteristics to the cable after it is bent, twisted, or vibrated. The central core member 10 comprises a metallic spring having closely or tightly adjacent or axially superposed turns

which coil continuously and lengthwise of the cable. The remaining portion of the cable **1** may comprise a plurality of strands **11** which are twisted about the central core member **10**. The strands **11** may comprise a plurality of wires **12** which are twisted about a plurality of wires **13** which in turn have been twisted about a core member **14**. The cores **14** could be constructed similar to the central core member **10**. If this were done then for some installations enough self-restoration would be provided which would make it possible to omit the central core member **10**. However, in other installations it might be desirable to construct the cores **14** similar to the central core member **10** and also use the central core member **10**.

It will be appreciated that when the aluminum tubular extensions **7** are compressed about the cable the aluminum is caused to flow between the strands **11** as well as between the wires **12**. Such flow of the aluminum between the strands **11** and the wires **12** provides an interlocked form of connection between the conductor clamps and the cable. This manner of connecting the conductor clamps to the cable makes it possible to keep the number of separate parts of the conductor spreader at a minimum.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and therefore, it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A resilient conductor spreader comprising a stranded steel cable having a pair of spaced clamps connected thereto, each of said clamps having only three separate elements comprising a pair of clamping members which are connected together by a bolt, said stranded steel cable having a central core member, said core member comprising a metallic spring having tightly adjacent turns which coil continuously and lengthwise of said cable, one of the members of both clamps being constructed from aluminum and having been connected to said cable by compression whereby some of said aluminum is disposed between the strands of said cable.

2. A resilient conductor spreader as in claim 1, wherein said clamping members have integral interlocking portions to prohibit said clamping members from moving or sliding with respect to each other.

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