

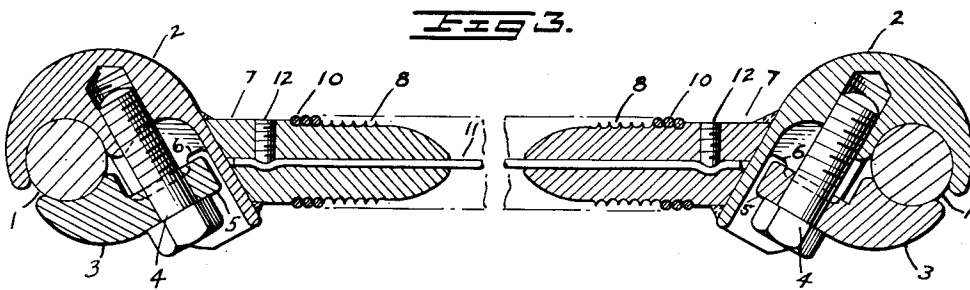
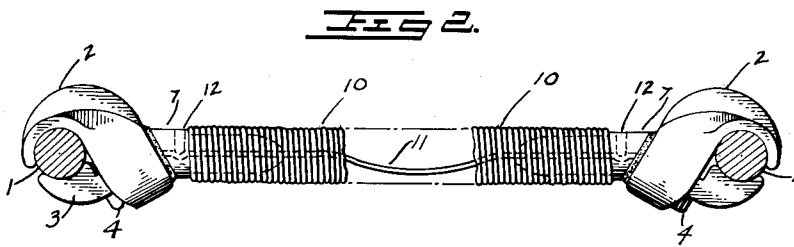
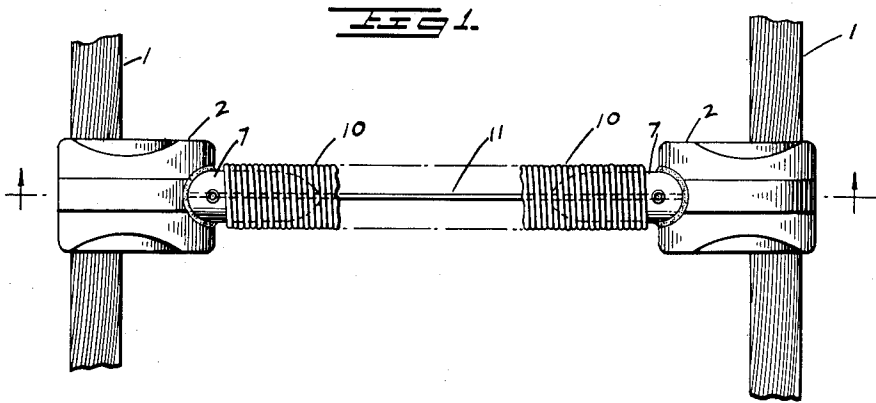
March 7, 1961

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2,974,184

BUNDLE CONDUCTOR SPACER

Filed Aug. 19, 1958



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2,974,184

BUNDLE CONDUCTOR SPACER

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Filed Aug. 19, 1958, Ser. No. 756,050

4 Claims. (Cl. 174-40)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention herein described and claimed may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of royalties thereon or therefor.

The invention relates to a device for connecting a pair of conductors at uniformly spaced distance apart.

In 3-phase high-voltage transmission lines, two or more conductors, collectively termed a "bundle conductor," may be employed for each phase. This practice results in certain advantages including improved loading capabilities and the reduction of radio interference. It is necessary that in this method the conductors be uniformly spaced a given distance apart, as for example, 16 or 18 inches. To maintain this spacing at the mid-span, a clamping device is required between the individual members of the bundle conductor, which must be able to accommodate four modes of differential movement; i.e., transverse, longitudinal, rotational, and vibratory. The clamping members which have been proposed for this purpose are not entirely satisfactory since they result in chafing and subsequent fatigue failure of the outer strands in the conductor.

It is an object of the present invention to provide a spacer for maintaining the individual conductors of a bundle conductor substantially a given distance apart.

It is a further object of this invention to provide means for maintaining the conductors of a bundle conductor a substantially given distance apart while permitting some movement to take place.

It is a further object of this invention to provide a spacer for maintaining the conductors of a bundle conductor substantially a given distance apart, said spacer having resilient means permitting limited movements between the conductor.

Other objects will become apparent from the detailed description of the invention given in the following disclosure.

The invention, basically, consists of a pair of clamps firmly mounted on a pair of conductors, the clamps being joined together by relatively large diameter closely wound coiled spring, having a slack flexible cable passing through the central portion of the spring and joining the clamps. The spring maintains the fixed spacing between the clamps, and is designed to provide resistance to compressive forces, while the cable limits any outward movements. This arrangement has been found to provide a minimum restriction of differential movement in any of the four modes given above. No corona forming points are presented since the spring diameter is at least equal to the diameter of the conductors. Aeolian vibration is dampened by the friction between the coils of the close-wound spring. Chattering does not occur since there are no loose parts, thereby eliminating wear and radio interference.

In the drawing:

Figure 1 is a plan view of the spacer shown joining two conductors.

Figure 2 is a view in elevation.

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Figure 3 is a sectional view taken along line A—A of Figure 1.

Since the instant clamping device is symmetrical about a transverse axis, it will be described only as to the right hand portion, it being understood that the left hand portion is exactly the same, like elements bearing the same reference numerals.

Cable 1 has firmly attached to it a clamp consisting of upper clamping element 2 and lower clamping element 3. As shown in Figure 3, element 3 has a rear portion 5 which bears against a recessed portion 6 of upper clamping element 2. Machine bolt 4 joining the upper and lower clamping elements 2 and 3 provides the clamping pressure on cable 1 when it is drawn up tight. Rigidly fastened to the rear of element 2 is a stud member 7, having spiral grooves 8 on its outer surface, and a bore 9 through its center. Grooves 8 are adapted to receive a spring 10, which can be threaded thereon. The diameter of stud 7 and spring 10 should be at least equal to the diameter of the conductor to eliminate any corona forming points. Cable 11 fits in the bore end and is fastened therein by a set screw 12.

In use, the preassembled unit is simply clamped on the pair of conductors desired. It is obvious that the spacing may be readily varied by altering the size of the spring and the cable, the latter being so disposed as to have about 1/2 inch slack when the spring is compressed. Three or more cables may be connected by joining them together in pairs using this spacer.

It is obvious that a various modification may be made without affecting the essence of the invention. For example, other clamping devices, and other means of fastening the stud to the clamp may be employed. A chain may be substituted for cable 11 and the spring may be detachably fastened to the stud by clamps, bolts, etc.

I claim:

1. In a bundle conductor for a high voltage transmission line wherein a pair of conductors are spaced a uniform distance from each other by spacer means; an improved spacer means comprising, a pair of opposing clamps each removably fastened to a conductor of said pair of conductors respectively, a stud means fastened to the rearward portion of each clamp, thread-like grooves on each of said stud means, a coiled spring having two end portions and a diameter at least equal to the diameter of one of the said pair of conductors, said coiled spring threadably engaging the grooves of the stud, said spring having substantial compressive strength when in normal retracted position, cable means detachably fastened to each of stud means, said cable means passing through the central portion of the coil spring, whereby said cable means limits the amount of extension of the spring.

2. In a bundle conductor for a high voltage transmission line wherein a pair of conductors are spaced a uniform distance from each other by spacer means; an improved spacer means comprising, a pair of opposing clamps each removably fastened to a conductor of said pair of conductors respectively, a stud means fastened to the rearward portion of each clamp, thread-like grooves on each of said stud means, a bore passing through each stud means axially thereof, a coiled spring having two opposite end portions, and a diameter at least equal to the diameter of a conductor, each of said end portions threadably engaging respectively the stud means on the opposing clamps whereby the spring extends between the said clamps, said spring having substantial compressive strength when in normal retracted position, a cable means fitted into said bore in both of said stud means and passing through the central portion of the coiled spring, means detachably fastening said cable means within said bore, said cable means limiting the amount of extension of the spring.

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3. A spacer as in claim 2 wherein the cable means comprises a wire rope.

4. In a bundle conductor for a high voltage transmission line, wherein a pair of conductors are spaced a uniform distance from each other by spacer means; an improved spacer means comprising, a pair of opposing clamps, each removably fastened to a conductor of said pair of conductors respectively, a stud means fastened to the rearward portion of each clamp, whereby the stud means on one clamp faces the stud means on the other clamp, a flexible cable means extending between the said calmps, said cable means being detachably connected at the ends thereof to the stud means on the said opposing clamps, an extensible coiled spring means having substantial compressive strength fastened to the stud means on the opposing clamps, thereby resiliently joining both clamps together, said spring means having a diameter at least equal to the diameter of one

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of the said conductors, the said cable means limiting the amount of extension of the spring means.

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