A. PRUESSMAN.

FLEXIBLE CONDUCTOR.

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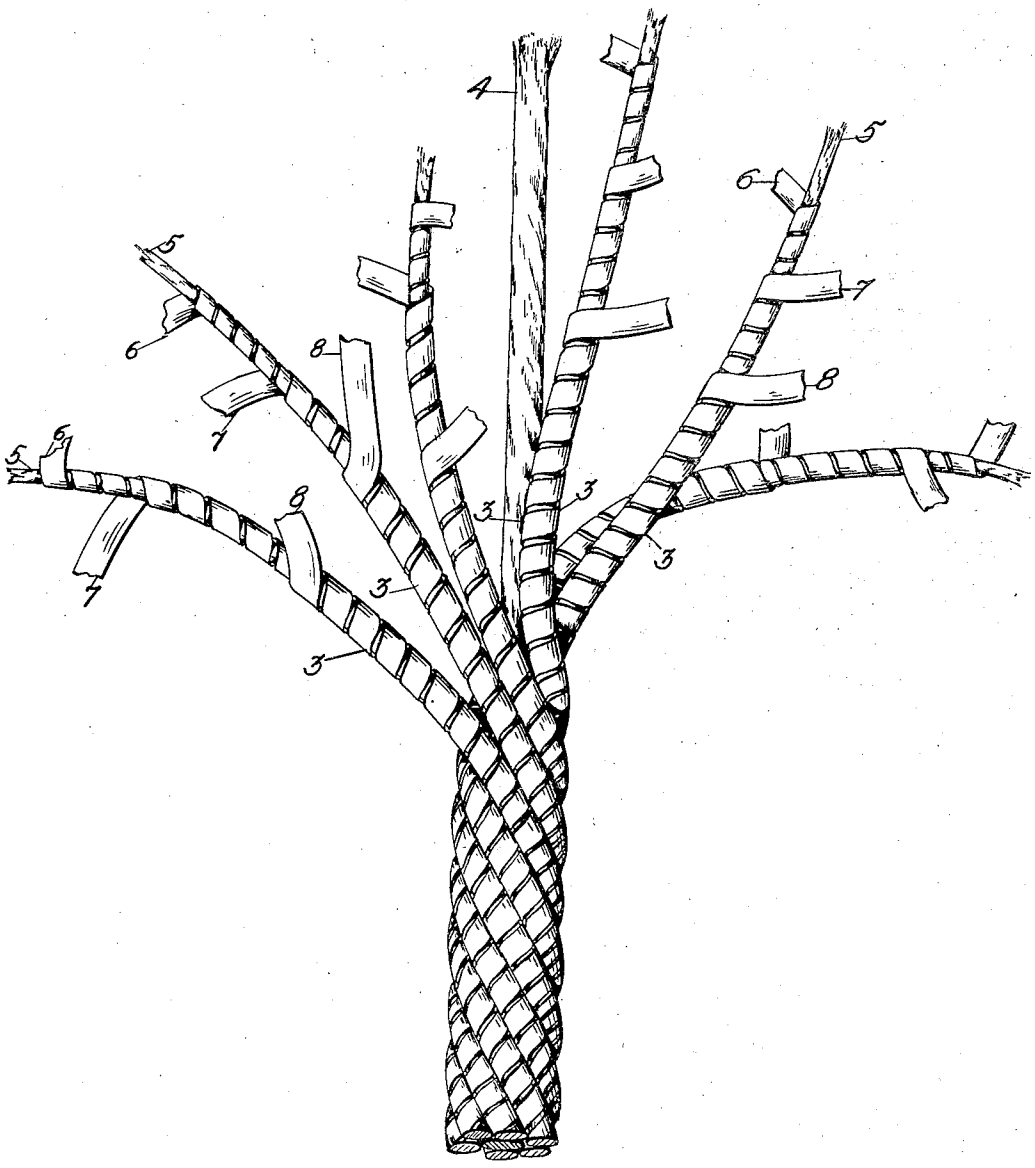
1,275,469.

Patented Aug. 13, 1918.



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UNITED STATES PATENT OFFICE.

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FLEXIBLE CONDUCTOR.

1,275,469. Specification of Letters Patent. Patented Aug. 13, 1918.

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To all whom it may concern:

Be it known that I, ALBERT PRUESSMAN, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Flexible Conductors, of which the following is a full, clear, concise, and exact description.

This invention relates to flexible conductors and in particular to flexible conductors of the type used in making tinsel cords for connecting telephones in circuit, making connections at telephone switchboards and other similar indoor uses.

The requirements of a satisfactory conductor for telephone cords for use in subscribers' stations and in connection with telephone switchboards are that the conductors be flexible, have a high electrical conductivity and be capable of withstanding severe service conditions for a long period of time. Flexible conductors having a suitable conductivity have been obtained by the use of tinsel threads, but the life of a cord having such conductors has not been satisfactory, due to the comparatively short period of service which they withstand before opens or partial opens in the conductors are developed, resulting in the cords becoming noisy and necessitating their removal and replacement by new cords.

It is the object of the present invention to produce a conductor which will not only possess the qualities of flexibility and high conductivity, but one which will in addition be capable of much longer service than it has been possible to obtain with the type of tinsel conductors used heretofore.

To attain this object, a feature of the invention consists in providing a composite conductor consisting of a plurality of strands, each of which in turn consists of a plurality of metal tapes wound in individual layers on a textile cord or thread. The individual tapes of each strand are wound in the same direction, the outer ones thereby causing the inner ones to bind closer to the core, and the strands are then twisted in the reverse direction in order to produce a composite conductor, which will be flexible and not subject to twisting or becoming kinked. By means of this construction it is possible to use metal tapes rolled so thin as to give the maximum amount of wear when subjected to repeated bending and yet maintain high conductivity as a result of the plurality of tapes used. Moreover each wound tape serves as an armoring for all inside tapes and the abrading or cutting of tapes, due to the sliding motion when a conductor is bent, is limited to the outer tapes of each strand. In case of the severing of one of these outer tapes the life of the conductor is not seriously affected, since the open part will be bridged by one or more of the tapes on the same strand. Accordingly it is possible to keep in service a cord employing conductors embodying this invention even though a number of the tapes of the various strands are cut in two, since the open tapes are bridged and do not permit a cord to become noisy.

This invention may be more clearly understood by reference to the accompanying drawing in which the figure shows a composite conductor of six strands made up in a rope-lay, each strand consisting of a textile cord, upon which three metal tapes are helically wound in individual layers.

The conductor illustrated in the drawing consists of six individual strands 3—3, twisted on core 4 of textile material. Each strand consists of a textile thread or core 5, upon which is helically wound a metal tape 6, preferably of a material having high conductivity. Over the tape 6, and in the same direction, is wound a similar metal tape 7, which acts as an armoring for tape 6, and assists in binding it to the core 5. A third metal tape 8 is next wound about tape 7, and in the same direction as the previous tapes, thereby completing the forming of the strand 3. In order to prevent any tendency for the conductor to kink or untwist, the direction of lay or twist of the strands making up the complete conductor is opposite to that of the metal tapes wound upon the core 5.

In service these conductors will be subjected to continual bending during which a sliding action takes place between adjacent strands, resulting in the abrading or cutting of the metal strands. By resorting to the proposed construction the cutting action, due to individual strands sliding over one another, is reduced to a minimum, since no cutting action takes place between the tapes of individual strands but only between the outer tapes of the different strands. Moreover, the construction is such that when a

break or partial break occurs, that particular spot is bridged by one or more tapes, and the resistance of the conductor is, therefore, not affected an amount sufficient to interfere with satisfactory transmission.

What is claimed is:

1. A flexible composite electrical conductor, comprising a large number of very thin and flexible strands of conducting material, a smaller number of strands of a non-conducting material with high flexibility and tensile strength, a plurality of such strands of conducting material being wound upon each of said non-conducting strands to form a composite strand, and the resultant composite strand being twisted into a rope-lay.

2. A flexible conductor comprising a plurality of conducting strands twisted together, each of said strands comprising a textile core about which are wound a plurality of thin conducting tapes, said tapes being wound in individual layers and in a direction opposite to the twist of the strands.

In witness whereof, I hereunto subscribe my name this 13th day of October, A. D. 1917.

ALBERT PRUESSMAN.