H. H. GLENN.

TELEPHONE CORD.

APPLICATION FILED MAY 10, 1916.

1,247,392. Patented Nov. 20, 1917.

Fig. 1.

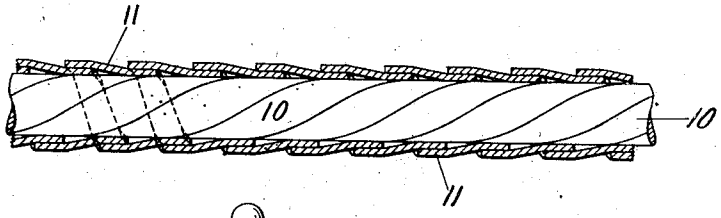


Fig. 3.

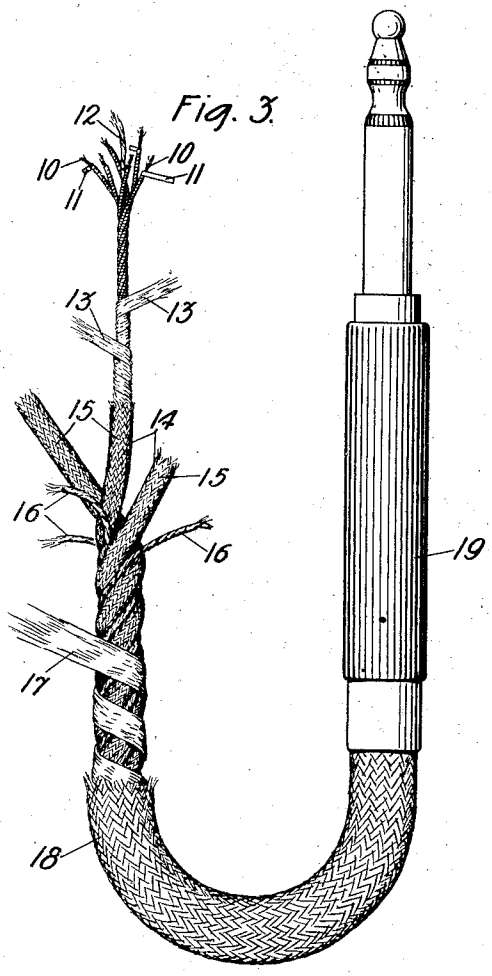
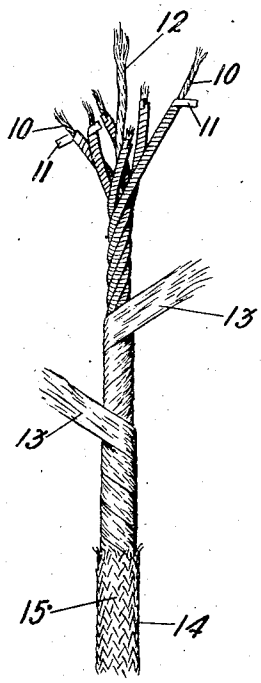


Fig. 2.



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UNITED STATES PATENT OFFICE.

HOWARD H. GLENN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TELEPHONE-CORD.

1,247,392. Specification of Letters Patent. Patented Nov. 20, 1917.

Application filed May 10, 1916. Serial No. 96,529.

To all whom it may concern:

Be it known that I, HOWARD H. GLENN, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Telephone-Cords, of which the following is a full, clear, concise, and exact description.

This invention relates to flexible telephone cords, and more particularly to an improved construction of the tinsel threads for use in such cords.

One object of this invention is to produce a telephone connecting cord in which the electrical resistivity will remain constant for an increased length of time. Another object is the production of a cord of increased physical or mechanical life. A further object is the production of a cord of reduced size without detracting from its efficiency. A still further object is to effect a reduction in the cost of manufacture of such cords.

Flexible connecting cords heretofore used at subscribers' stations and central offices have been a source of considerable annoyance because of the frequent occurrence of opens or partial opens in the conductors, resulting in the so-called noisy cords. Trouble has also been experienced at the central offices due to the fraying of the braided covering near the base of the plug.

The first of these objectionable features may be overcome to a large extent by properly constructing the individual conductors of the cord. Preferably this is accomplished by employing for each conductor of the cord a plurality of conducting or tinsel threads stranded together. Each tinsel thread preferably consists of a metallic ribbon applied helically around a central core of textile thread, so that each turn of ribbon overlaps the preceding turn by a definite or fixed amount, the tinsel threads thus formed being twisted or stranded together in such a manner that all of the threads lie in the same direction with respect to the overlapping edges of the metallic ribbon. By stranding the tinsel threads so that all projections caused by the overlapping ribbon lie in the same direction, the catching, and consequent cutting action between adjacent threads of tinsel when sliding action occurs, due to bending, is reduced to a minimum.

With the overlapped construction, the breaking of the metallic ribbon in one or more places does not destroy the electrical continuity of that particular thread, because the break is bridged by the overlapping of the next turn, and therefore sudden changes in the electrical resistivity of the connecting cords, resulting in disturbing noises, are avoided. This is an important feature in cords used in central offices, especially of the central battery type wherein conductors of the connecting cord constantly convey current to the transmitters at the substations, as any change in the electrical resistivity of the conductors results in producing annoying clicks and objectionable sounds in the telephones, and seriously interferes with the conversation.

It has been conclusively proven that flexible conducting cords of considerably longer life can be produced with less conducting material by employing threads with overlapped metallic ribbon than by employing threads with spaced metallic ribbon.

By using overlapped ribbon in place of spaced ribbon, it has been found possible to use a somewhat heavier metallic ribbon and apply it to the central core at an increased speed. It has also been found that by using central cores with overlapped ribbon, a smaller number is required for obtaining the desired electrical conductivity of the conductors, and a material reduction can be made in the diameter of the individual conductors. With this reduction in the diameter of the individual conductors and consequent reduction in diameter of the stranded cord, a heavier and more substantial outside braiding may be employed and still keep the outside diameter of the cord within the former limits, thereby overcoming, to a large extent, the trouble experienced from fraying of the braid at the base of the plug where the cord receives the greatest amount of handling and bending.

This invention will be more fully understood from the following description, in which Figure 1 is an enlarged sectional view of a tinsel thread, showing the manner of overlapping the tinsel; Fig. 2 is a view of an insulated conductor formed by stranding six threads of tinsel, such as shown in Fig. 1, around a central core; and Fig. 3 illustrates a three-strand connecting cord provided with a plug terminal such as required for telephone switchboards.

In the cord illustrated, the center of the tinsel thread is a textile core 10, preferably of No. 20 three-ply glazed cotton, with metallic ribbon 11 helically applied thereon. The metallic ribbon is preferably of copper and about .001 inch in thickness and .018 inch in width. However, the size of the thread and ribbon may be varied to produce the particular type and size of finished cord desired. From Fig. 1 it will be noted that the metallic ribbon is applied to the thread smoothly and with a definite pitch or overlap.

In Fig. 2 is shown a conductor composed of six tinsel threads, each formed of overlapped tinsel stranded around a core 12 of hemp twine. Over the stranded tinsel threads is applied two servings of tussah floss 13 in reverse directions. The conductor is then passed through a moisture proofing compound, after which the conductor is covered with a braiding 14, preferably of No. 20 two-play cotton, although other sizes and grades of material may be used.

In Fig. 3 are shown three conductors 15, each like that illustrated in Fig. 2, stranded together to form a connecting cord such as is commonly used for interconnecting subscribers at central offices. In the interstices between the conductors are placed threads or fillers 16 for giving the finished cord a smooth uniform surface. A spaced binding of cotton 17 is applied over the stranded conductors and beneath the outer covering of glazed cotton braiding 18, to keep the fillers in place and to hold the conductors twisted and the cord round under service conditions. The outer braiding 18 is applied with a single thickness, except near the base of the plug where, because the greatest amount of wear and bending takes place, the braiding is applied double. The conducting cord thus formed is screwed tightly into the base of the terminal plug 19 as a means of securing it thereto.

What is claimed is:

1. A tinsel thread for electrical conductors composed of a metallic ribbon helically applied around a central core with a definite overlap.

2. A conductor comprising a plurality of conducting tinsel threads stranded together, each tinsel thread composed of a metallic ribbon helically applied around a core with a definite overlap and a protective covering for said conductor.

3. In a conducting telephone cord, a plurality of insulated stranded conductors, each conductor composed of a plurality of conducting tinsel threads stranded together, each tinsel thread composed of a metallic ribbon helically applied around a core with a definite overlap, the projections caused by the overlapping edges of the ribbon all lying in the same direction.

4. In a conducting telephone cord, a plurality of insulated conductors each composed of a plurality of conducting tinsel threads stranded together, each tinsel thread composed of a metallic ribbon helically applied around a core with each convolution overlapping the preceding convolution, and a plurality of insulated conductors thus formed stranded together.

5. A conductor comprising a group of tinsel threads stranded together, each tinsel thread being formed by helically applying a metallic tape or ribbon around a core with each convolution of the tape overlapping the preceding convolution, and a protective covering surrounding said group of tinsel threads.

In witness whereof, I hereunto subscribe my name this 9th day of May A. D., 1916.

HOWARD H. GLENN.