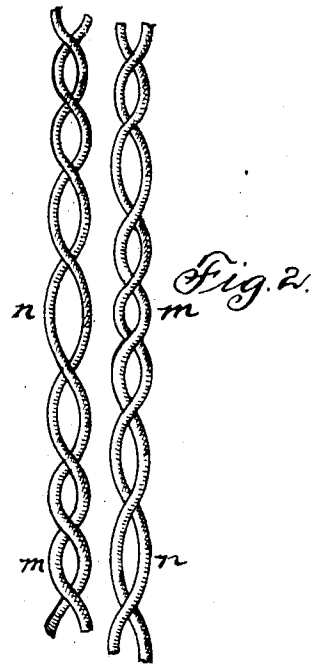
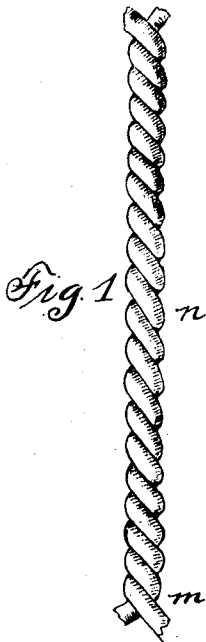


(No Model.)

W. R. PATTERSON.
TELEPHONE CABLE.

No. 502,262.

Patented July 25, 1893.



Witnesses:

George L. Cragg
Harris L. Templeton

Inventor:
William R. Patterson.
By Barton Brown
Attys

UNITED STATES PATENT OFFICE.

WILLIAM R. PATTERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
WESTERN ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-CABLE.

SPECIFICATION forming part of Letters Patent No. 502,262, dated July 25, 1893.

Application filed July 30, 1892. Serial No. 441,683. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. PATTERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone-Cables, (Case No. 98,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to telephone cables and its object is to produce a cable with wires so disposed that cross talk between the different circuits may be prevented.

Heretofore it has been usual to twist the wires together in pairs with a regular and uniform twist, and make use of the different pairs for metallic circuits. The object of twisting the wires in pairs, as heretofore employed, is to provide that the two limbs or sides of the same circuit may be placed as nearly as possible in the same position with respect to the other wires of the cable, in order that the currents induced in the two sides of the same pair may neutralize one another. It is evident that if the two wires constituting a pair are not in the same relative position with respect to the circuit from which the induced currents are received, the current in one wire of a pair will not be equal to the current in the other wire of the same pair, and hence there will be resulting cross talk. In cables laid up as heretofore such want of harmony as between the wires of a pair and the circuit from which the induced currents are received, may be occasioned by two adjacent pairs starting at the same relative positions of their twists, so that there will be a parallelism of the four wires constituting the two pairs throughout the entire length of the cable, the case being the same as using the two adjacent wires of a strand of four, instead of the two diagonally opposite wires of the same strand for the two branches of the circuit. It is evident that if the twist of one of the strands constituting a pair of wires was of a different pitch from that of the other parallel strand, there would

not be that harmful parallelism, as between the two strands, which result in objectionable cross talk.

My invention herein consists, speaking generally, in twisting the wires of the strands or pairs together at a different pitch, or at different degrees at alternate sections, and in combining two or more of such strands into a cable so that parallelism between the two wires of any two different strands may be avoided.

My invention further consists in telephone cables laid up in pairs, the strands constituting the different pairs having a different amount of twisting at alternate sections.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a view of a portion of a strand having its wires at different sections twisted to a different pitch or degree. Fig. 2 is an enlarged view, showing two such strands thus twisted together and placed side by side, so that sections having different degrees of twisting will be opposite one another.

Like parts are indicated by similar letters of reference throughout the two figures.

Referring to Fig. 1, it will be seen that at the end or section *m*, the pitch or degree of twisting is greatest, with its pitch growing less toward the other end, until at section *n*, the pitch or degree of twisting is least. Thus the strand is given, so to speak, an undulatory twist throughout its entire length. In Fig. 2 two of such strands are shown placed side by side, so as to break joints with respect to one another with respect to the degree of twisting as between oppositely placed parts or sections of the different strands. I find that strands thus formed may be made into cables, without giving special attention to the manner in which they are placed in the cable. The chance is remote that two adjacent strands should be cut off at exactly the same relative position of the three feet constituting an undulation with respect to the degree of twisting.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

The combination of two or more pairs of wire, the wires constituting the different pairs
5 being twisted together with an undulating or varying degree of twisting, said strands being laid in the same cable to break joints with respect to the different undulations of twist-

ing, whereby cross talk is prevented, substantially as and for the purpose specified. 10

In witness whereof I hereunto subscribe my name this 23d day of May, A. D. 1892.

WILLIAM R. PATTERSON.

Witnesses:

CHARLES A. BROWN,
GEORGE L. CRAGG.