E. F. PHILLIPS.
Telephonic-Conductor.

No. 206,821. Patented Aug. 6, 1878.

Fig. 1.

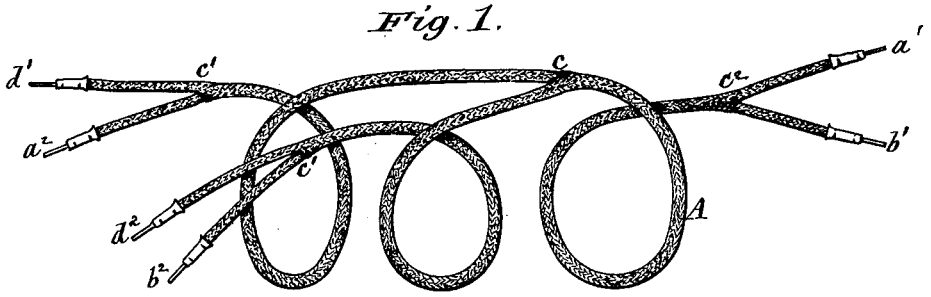


Fig. 2.

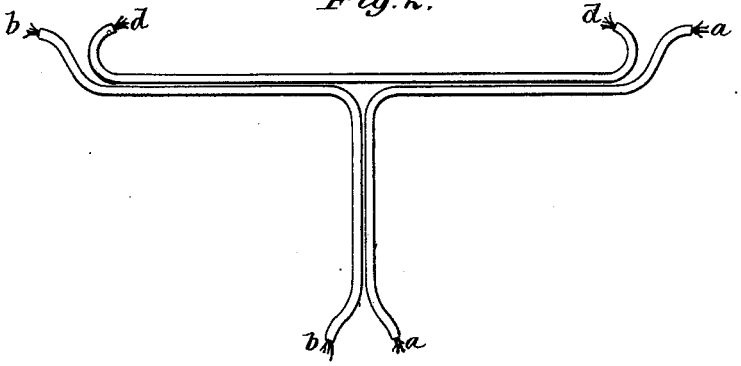
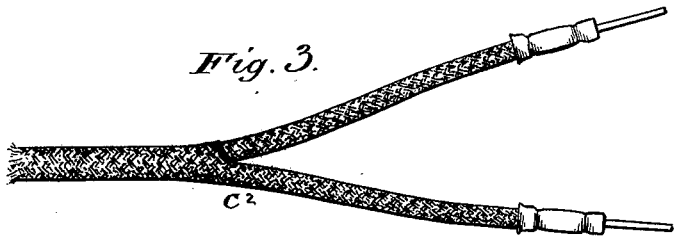


Fig. 3.



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UNITED STATES PATENT OFFICE.

EUGENE F. PHILLIPS, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN TELEPHONIC CONDUCTORS.

Specification forming part of Letters Patent No. **206,821**, dated August 6, 1878; application filed July 6, 1878.

To all whom it may concern:

Be it known that I, EUGENE F. PHILLIPS, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Telephonic Conductors and Switch-Cords; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of my invention.

It is well known that electric conductors containing two or more wires or sets of wires have been heretofore made for use with vocal telephones, and that at each end the two or more insulated conductors have been branched and provided with separate tips. At the point from which these ends diverge from the main body of the cord they have heretofore been wrapped with seizing twine or silk; but this can seldom be done neatly without a greater expenditure of time than the goods will warrant, and as neatness and elegance in these goods are desired by the trade and user if attainable at low cost, one object of my invention is to attain a higher degree of neatness of exterior finish at the junction of these branches than has heretofore been possible with pre-existing methods.

This portion of my invention consists in a telephonic conductor or switch-cord which is branched at one or more points, and has an exterior braided or woven jacket, which is a continuous fabric, at the junction of the branches, and extends continuously from or to the end of one of said branches.

With this construction a braided or a woven jacket from the end of one of the branches throughout the length of the conductor to the extreme end of one of the branches at the opposite end can be made in one continuous tubular fabric, and it presents at the branch a thoroughly neat and attractive appearance. A branched telephone-conductor inclosed within a braided or woven jacket, which is composed of strands extending continuously from the end of one branch throughout the length of the cord to the tip of a branch at the opposite end, constitutes another feature of my invention.

It is also well known that the branch is liable to frequent strains induced by longitudinal strain on the branching ends in lines at right angles to the line of the main cord, and another object of my invention is to practically unite these ends by a strengthening-cord, which extends from the extreme end of one of the branched ends to the branching point, and thence to the extreme end of the other branch, so that when the two ends are pulled in the same line at right angles to the body of the conductor the strain will be borne by the strengthening-cord; and this portion of my invention consists in a bifurcated or branched telephonic conductor or switch-cord containing insulated electric conductors provided with a strengthening-cord, which extends from the extreme end of one of the branches to the main body of the conductor, and thence to the extreme end of the other branch. This strengthening-cord need not necessarily be composed of fibrous matter, as wire can be used if properly insulated from the electric conductors and their tips; but because of this necessity I prefer to use cord or twine.

Another feature of my invention is one of great practical value for use in connection with a pair of telephones, so that one may be applied to each ear of the person receiving communications. Heretofore three separate cords have been used in this connection, two for connecting the proper poles of each magnet with the line and ground, respectively, and a cross-cut cord or wire from one telephone to the other, so connecting the poles thereof as to complete the circuit through the magnets. This multiplicity of separate cords is obviously inconvenient, and the object of this feature of my invention is to consolidate in one complex cord the several conductors required; and my said invention further consists in an electric conductor for service with two telephones, having two main electric conductors and two tips at one end for connection with ground and line, and branched midway, and containing in each branch one of the main conductors and an intermediate or cross-cut conductor, which extends from the end of one branch to the junction of the branches with the main cord, and thence to the end of the other branch, each being provided with its separate tip for connection with a telephone. Such a complex conductor has, therefore, at one end two

tips, and at the opposite end four tips. The disposition of the cross-cut or intermediate conductor, as described, causes it to operate as a strengthening medium at the junction with the main cord, and one of these complete cords, therefore, embraces also the last previously-stated feature of my invention.

To more particularly describe my invention, I will refer to the accompanying drawings, in which Figure 1 represents a telephonic conductor embodying the several features of my invention. Fig. 2 represents the several conductors insulated and arranged as contained within their inclosing-jackets. Fig. 3 represents a short length of the main cord and its two branches, showing on an enlarged scale the finished effect attained at the junction.

The main body A of the cord contains the insulated conductors *a* and *b*, and these are respectively provided with tips, as shown at a^1 and b^1, for connection with the ground and line wires respectively. At a point about midway of the length of the complex conductor it is branched, as at *c*, one branch containing the conductor *a* and the other the conductor *b*, which are each, at a^2 and b^2, provided with tips for connection with the proper pole of the magnet of the telephone with which each is used. Each branch of the complex conductor also contains a cross-cut conductor, *d*, which is as long as both branches, extending from the end of one to the junction with the main stem at *c*, thence to the end of the other branch, and both of its ends are provided with tips, as at d^1 d^2, for connection with two telephones.

When properly connected, it will be seen that electric connection is attained between the ground and line wires through the magnets of both telephones and the cross-cut conductor *d*. In order to provide separate ends for receiving the tips at the end of each branch, these conductors are again branched, as at c^1, and a similar junction occurs at the opposite end of the main cord, at c^2.

That portion of my invention which relates to the finished effect of the outer jacket at these several junctions is attained as follows: The several electric conductors are first suitably insulated, (preferably with fibrous material wound or braided.) and sometimes treated with insulating matter. Commencing, for instance, on the conductor *a*, at a^2, its outside jacket is braided to a point beyond its junction with the cross-cut conductor at c^1, and then it is cut free from the braiding-machine and connected by a winding-twine to conductor *d*. The conductor *d*, from d^1, is then covered down to the junction c^1. The previously-covered end is then passed upward through the strands in the machine, and the braiding operation continues (preferably with a slower feed) upon both conductors to the point at which they are to merge with the main body of the cord at junction *c*. The free end of the cross-cut conductor is then lifted through the strands, and, after passing said junction, say, for an inch or so, the braiding is cut from the machine. Next, at the opposite end of the main cord, one of its ends—as, for instance, that at b^1—is then covered to a point beyond its junction with the main cord at c^2, and then cut from the machine. Now, returning to the uncovered branch at the opposite end, one conductor—as, for instance, that at b^2—is covered beyond the point of junction with wire *d* at c^1, and cut from the machine, after which the wire *d* is covered downward from its end d^2 to the point of junction at c^1. The previously-covered end is then passed upward through the strands and the braiding continued down to the main junction *c;* and after passing the opposite covered branch upward through the strands the braiding is still further continued down the main body of the conductor until the junction c^2 of wires *a* and *b* is reached, and the wire *a* is then continuously covered, after passing the previously-covered end b^1 upward through the strands, as before.

It will be seen that with this method of applying the jacket there are continuous strands and a continuous inclosing fabric from one end of one of the branches to the extreme end of one of the branches at the opposite end of the complex conductor. With a little practice an ordinary operative can skillfully and rapidly apply these jackets in the manner described, and secure desirable finish at the several junctions.

It will be seen that the conductor *d*, with its strong insulating covering, operates as a strengthening medium at the junction *c*, and that, in like manner, strengthening-cords applied to the several branches and junctions will prevent their rupture by strains longitudinal therewith but at right angles to the line of the main cord, or one of its branches, as the case may be.

While my invention is mainly of value in connection with telephones, I do not limit myself thereto, as some or all of the features thereof are of value in what are commonly known as "switch-cords."

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A branched telephone-conductor provided with an exterior braided or woven jacket, which is a continuous fabric, at the junction of the branches, and extends continuously from or to the end of one of said branches, substantially as described, whereby a strong, neat, and desirable exterior finish is attained at said junctions, as set forth.

2. An electric telephonic conductor or switch-cord containing two or more insulated electric conductors, which are branched from the main body of the cord and have an exterior braided or woven jacket which is composed of strands extending continuously from the end of one branch throughout the length of the cord and terminating at the end of another branch, substantially as described.

3. A branched telephone-conductor or switch-

cord provided with a strengthening-cord which extends down one branch to the junction of the branches, and thence upward on another branch, substantially as described.

4. A telephonic conductor containing two main electric conductors insulated and united in one jacket, branched midway, and containing in each branch one of the main conductors, and a cross-cut conductor, which extends from the end of one branch to its junction with the main cord, and thence to the end of the other branch, substantially as described, whereby the cord may be used with a pair of telephones, and the several conductors be united and convenient for use, as set forth.

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