(No Model.)

# F. L. POPE.

## ELECTRICAL CONDUCTOR.

No. 294,148. Patented Feb. 26, 1884.

*Fig. 1.*

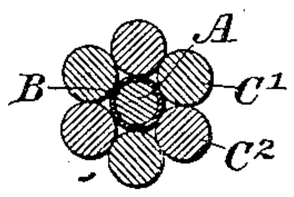
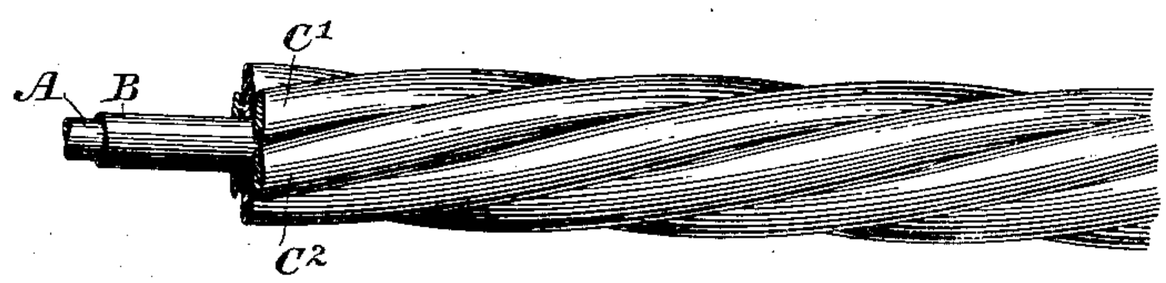



*Fig. 2.*




WITNESSES

Wm A. Skinkle

Geo W. Brick

INVENTOR

Frank L. Pope,

*By his Attorneys*

Pope Edgecomb & Butler.

# UNITED STATES PATENT OFFICE.

FRANK L. POPE, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE POSTAL TELEGRAPH AND CABLE COMPANY, OF NEW YORK.

## ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 294,148, dated February 26, 1884.

Application filed June 2, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK L. POPE, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Electrical Conductors, of which the following is a specification.

My invention relates to conductors designed for the conveyance of electrical currents, and more particularly to a certain class of compound conductors in which one metal selected, primarily, on account of its high coefficient of tensile strength is mechanically combined with another metal possessing high electrical conductivity.

My invention is especially designed to be used in connection with systems of electric lighting and electrical power transmission, or wherever it is necessary to convey electric currents of large volume. In such systems it has heretofore been usual to employ solid cylindrical copper conductors of large diameter, which, having insufficient elasticity and tensile strength in proportion to their weight, are liable to stretch or break when suspended between distant points of support.

My invention consists in a compound conductor composed of a central metallic core of adequate tensile strength, which core is preferably of steel, closely coated, by electroplating or otherwise, with a continuous envelope of a suitable highly-conducting metal—such as copper—and surrounded by one or more conductors of the same metal as that which forms the coating or envelope of the central steel core, or of some other metal having approximately the same electro-motive properties.

The particular subject-matter claimed will be hereinafter specifically designated.

My invention is represented in the accompanying drawings, in which Figure 1 is a transverse section, and Fig. 2 a longitudinal view, of one form of my combined conductor.

Referring to the drawings, A is a central core, which I prefer to make of a tough and properly-tempered steel, the object in view being to obtain therein a high coefficient of tensile strength.

B is a close covering or envelope formed upon the core A, composed of a suitable metal of high electrical conductivity—as, for example, copper; and C′, C², &c., are solid cylindrical wires, preferably of the same metal as the coating B, laid about the central core and in contact with said external coating or envelope, as shown in Fig. 1.

It is essential that the coating of highly-conducting metal surrounding the central core of the conductor should continuously and completely envelop the same and be sufficiently thick to prevent any possible access of moisture to the core; otherwise a local electrolytic or galvanic action will be set up between the dissimilar metals by the action of such moisture. It is therefore preferred to place this metal upon the core by the well-known process of electro-deposition, although in some instances it may be applied by mechanical means.

It will be understood by those versed in the art that no local galvanic action will be set up between the outer wires, C, and the envelope surrounding the central core, inasmuch as the contact of similar metals cannot give rise to an electro-motive force, nor produce electrolytic action.

The central core may be constructed to give any requisite tensile strength, so that the cable or strand may be suspended between far-separated points. The core, while serving primarily to give the necessary tensile strength, also materially increases the conductivity of the complete strand.

The surrounding wires may be of any convenient size or number, either six or eighteen being in most cases preferable numbers.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a central core formed of metal having a high coefficient of tensile strength, a continuous metallic coating of greater specific electrical conductivity than the central core closely enveloping the same, and one or more conductors formed of a metal having approximately the same electro-motive properties and conductivity as the coating laid about said coating and its inclosed central core.

2. The combination, substantially as hereinbefore set forth, of a central conductor of steel closely enveloped in a continuous coating of copper, and one or more conductors of copper laid upon or around the steel conductor and its exterior envelope.

In testimony whereof I have hereunto subscribed my name this 1st day of June, A. D. 1883.

FRANK L. POPE.

Witnesses:
DANIEL W. EDGECOMB,
CARRIE E. DAVIDSON.