(No Model.)

W. PAUL & T. J. WOOD.

COMPOUND WIRE.

No. 309,509. Patented Dec. 16, 1884.

Fig. 1.

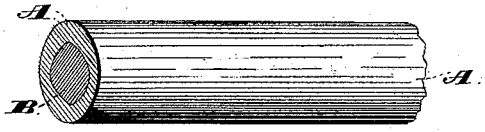
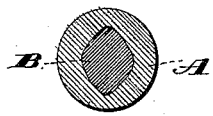


Fig. 2.



Witnesses:
Jas. E. Hutchinson.
Henry C. Hazard.

Inventor.
William Paul & Thomas J. Wood
by Brindle & Russell
Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM PAUL AND THOMAS J. WOOD, OF ANSONIA, ASSIGNORS OF ONE-THIRD TO FELIX CHILLINGWORTH, OF NEW HAVEN, CONNECTICUT.

COMPOUND WIRE.

SPECIFICATION forming part of Letters Patent No. 309,509, dated December 16, 1884.

Application filed December 11, 1883. (No model.)

To all whom it may concern:

Be it known that we, WM. PAUL and THOS. J. WOOD, of Ansonia, in the county of New Haven, and in the State of Connecticut, have invented a new and useful Improvement in Compound Wires; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a perspective view of a piece of our improved compound wire, and Fig. 2 a view of a cross-section of the same.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to provide an improved compound wire for electrical purposes; and to this end it consists of a compound wire having a non-cylindrical core, as hereinafter described, and specifically pointed out in the claims.

In the drawings, A designates the envelope or outer portion of the wire, and B the contained core of a non-cylindrical shape. Compound wires have been found a necessity where great conductivity and still considerable tensile strength are required. Copper, which is considered the best metal to use in wires where great conductivity and little resistance are desirable, has not tensile strength enough. As is well known, where a wire made of this metal alone is stretched between poles as a telegraph or telephone wire, it gradually lengthens out and sags down under the influence of its own weight and the changes in temperature. Such sagging is obviously objectionable where several wires are strung near each other. In order to obtain a wire which shall combine the advantages of the great conductivity of copper and the stiffness and strength of steel or iron compound wires have been made having a core of steel or iron surrounded by a conducting envelope of copper. The core in this case forms the backbone for the highly-conducting portion of the wire. As heretofore made, however, these wires have always had a round or cylindrical core. The great objection to the use of such wire has been found to be that a little bending suffices to separate the envelope from its core, a result which is especially to be avoided. Wherever the envelope is thus separated from its core, it is liable to rupture, either partial, so as to diminish the conductivity of the wire, or complete. Such separation and cracking or breaking of the envelope exposes the core to moisture from without and the rapidly-deteriorating action of the atmosphere.

With compound wire as heretofore made and described above with its cylindrical core it has been found impossible to successfully join the ends of two portions of wire by the ordinary telegraph-joint without separating the envelope from its core and rupturing it. Other and less desirable means or methods of joining the ends of the wire must be used.

With our improved wire the telegraph-joint can be successfully made without any separation or breaking of the envelope, notwithstanding the bending and necessary twisting in making such a joint.

The peculiarity of our compound wire, as distinguished from those heretofore manufactured, is that the core is non-cylindrical, as shown in the drawings. This irregularity can be produced in any desired way. The core as used in forming the compound bar or rod from which the wire is to be formed can be made irregular or non-cylindrical in shape, or such core can be cylindrical in form as it appears in the bar, and be rendered irregular or non-cylindrical in the process of rolling and drawing down, as described in another application to be filed by us; also, where the compound bar or rod is made by depositing a coating of copper upon the core by galvanic action the latter can obviously be either non-cylindrical in shape at first before the copper is deposited upon it, or can be afterward rendered so in the process of manufacturing the wire from the bar or rod, as indicated above. Where the wire is to be formed directly by the plating process, the core is of course to be made irregular or non-cylindrical in shape before subjecting it to such process.

As indicated above, it has been found that if the core of the wire be non-cylindrical in shape the copper covering or conducting envelope cannot easily be separated therefrom, and the compound wire can be used as a single metal wire could, and the ends of the different portions of the wire can be connected together by the strongest, simplest, and most

desirable form of connection for electrical conductors, known as the "telegraph-joint."

If for any reason it should be found desirable to form the core of material of great electrical conductivity, and to make the envelope of metal or material having the necessary tensile strength to support the whole, the core can obviously, to advantage, still be made of a non-cylindrical shape for the same purpose as in the construction already described herein.

We do not limit ourselves to a wire formed of copper and iron or steel, as it may be found advantageous for certain purposes to use other metals, metallic compounds, or alloys for the core and envelope.

Whatever the materials may be, the wire, as an article of manufacture made in accordance with our invention, is to have a non-cylindrical core, so that the most perfect union between core and envelope will exist, and the two will be most firmly and inseparably held together against separation by bending or twisting of the wire.

Having thus described our invention, what we claim is—

1. As an article of manufacture, a compound wire having a non-cylindrical core, substantially as shown and described.

2. As an article of manufacture, a compound wire consisting of a conducting envelope or covering surrounding a strengthening-core of non-cylindrical shape, substantially as shown and described.

3. As an article of manufacture, a compound wire consisting of a non-cylindrical iron or steel core surrounded by copper, substantially as shown and described.

4. As an article of manufacture, a compound wire having a non-cylindrical core and a cylindrical envelope, substantially as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands this 1st day of December, 1883.

WM. PAUL.
THOS. J. WOOD.

Witnesses:
C. B. MATTHEWMAN,
PHILIP G. RUSSELL.