(No Model.)

J. D. BISHOP.

ELECTRICAL CONDUCTOR.

No. 588,382. Patented Aug. 17, 1897.

Fig. 1.



Fig. 3.

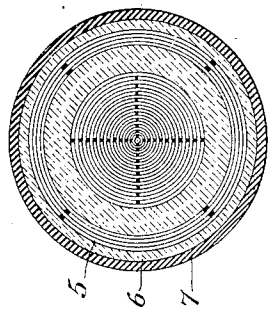
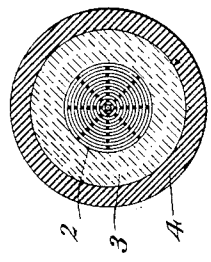


Fig. 2.



WITNESSES:
C. E. Ashley
H. W. Lloyd.

INVENTOR:
James D. Bishop
By his Attorney
Lott H. Read

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES D. BISHOP, OF NEW YORK, N. Y.

ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 588,382, dated August 17, 1897.

Application filed May 6, 1897. Serial No. 635,380. (No model.)

To all whom it may concern:

Be it known that I, JAMES DRAPER BISHOP, a subject of the Queen of Great Britain, residing in New York, county and State of New York, have invented certain new and useful Improvements in Electrical Conductors, of which the following is a specification.

This invention relates to electrical conductors, the object being to make a conductor for heavy currents having high insulation, small inductive capacity, and a maximum degree of flexibility. Conductors of this kind are now made by winding about a central core a number of independent conductors formed each of seven or more strands of round wire and inclosing the whole in rubber and, when a protective armor is deemed necessary, covering the rubber with a sheathing of lead pipe. The large interstitial spaces between the several component conductors and strands make such a compound conductor more bulky and heavy than is necessary, the weight increasing with the bulk. In my construction the size is reduced by winding about the central core wire in the form of ribbon, giving the several layers of ribbon a reversed twist, thereby considerably minimizing the cross-section of the completed conductor, promoting a greater degree of flexibility, and increasing the insulation resistance and reducing the inductive capacity by reducing the conducting-surface. I preferably use a plurality of flat or ribbon-shaped wires for each lay, leaving a clear space longitudinally of the conductor between each pair of ribbons of the same lay, thus permitting them to shift axially of the conductor when the latter is bent or twisted and thus securing the utmost flexibility.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side elevation of a conductor embodying my improvements, the insulation being shown removed. Fig. 2 is a cross-section of an armored conductor embodying my improvements, and Fig. 3 is a cross-section of a concentric or round metallic-circuit armored conductor.

1 represents a core, which may be of jute or other pliable elastic material, but may with advantage be made of copper, steel, or phosphor-bronze wire. About this core is wound spirally in a cabling-machine one or more ribbons or flat wires of copper or other good conductor. The number of conductors used may be determined by convenience of cabling for the pitch required, a steeper pitch and more ribbons per lay being employed where greater flexibility for the completed conductor is required. In the conductor exemplified in the drawings four ribbons are employed in each lay, as seen in Fig. 2, and the consecutive lays are wound in reverse directions, as seen in Fig. 1. When the desired conductivity has been reached, the conductor is inclosed in an envelop of insulating material 3, and may be armored, if desired, by a protective covering 4 of lead.

In Fig. 3 a double concentric conductor is shown, formed of wire ribbon, as hereinbefore described, the return-conductor 5 being laid on the insulating material. This also is provided with an insulating-covering 6, the outer armor 7 being employed or omitted, according to the uses to which the conductor is to be put.

In a conductor as herein described it is evident that the waste interstitial space is much reduced as compared with a composite conductor formed of wound wire, thus rendering it possible to put the same quantity of copper in a smaller section without decreasing the flexibility or tensile strength. With the same degree of conductivity therefore the cross-section of the completed conductor is considerably reduced, thus decreasing the superficial area and increasing the insulation per unit of length and correspondingly lowering the inductive capacity. The weight and cost of such a conductor are also considerably less than that of one made of round wire, since the smaller cross-section greatly reduces the weight of insulating material needed to cover the conductor to a given depth, as also the weight of metal in the armor to attain the same degree of protection.

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

1. An electric conductor composed of a plurality of wire ribbons wound side by side longitudinally of the conductor and having intervening air-spaces.

2. An electric conductor composed of a plurality of metallic ribbons wound spirally, suc-

cessive lays having reversed directions of winding and being in metallic contact with one another.

3. An electric conductor containing layers of copper ribbon wound spirally with intervening air-spaces, one such layer or group of layers constituting the outgoing conductor, the other the return-conductor, and a layer of insulating material between the two.

4. An electric conductor containing a central core and a plurality of metallic ribbons wound side by side spirally about said core, adjacent ribbons having intervening air-spaces.

5. An electric conductor containing a plurality of wire ribbons superposed upon one another in successive reversely-wound layers in metallic contact with one another, an insulating-covering, and a protective outside armor.

In testimony whereof I have hereunto subscribed my name this 31st day of March, A. D. 1897.

J. D. BISHOP.

Witnesses:
W. H. RODIER,
H. T. RICHARDS.