

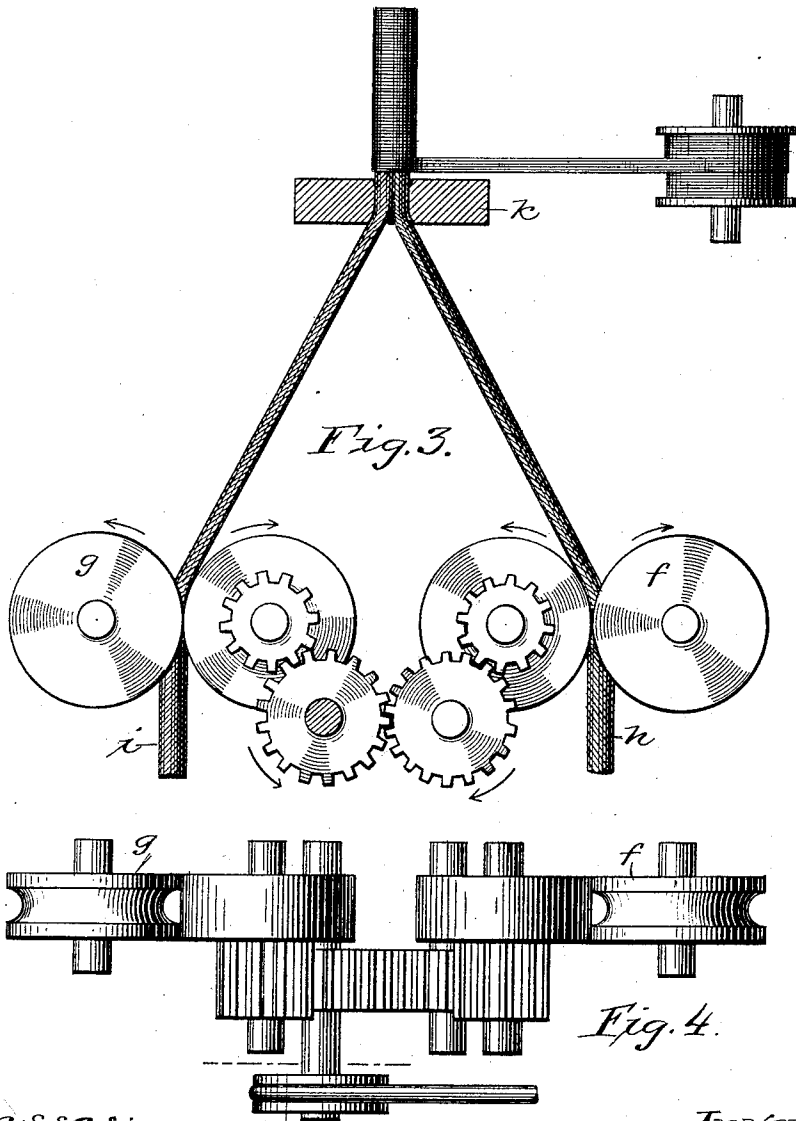
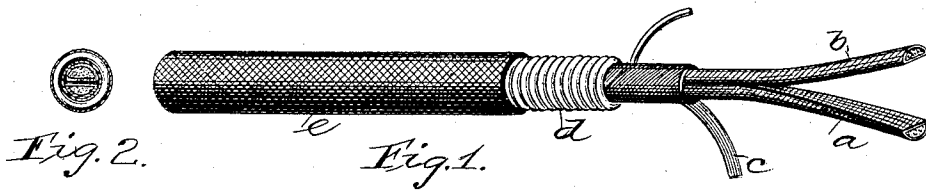
(No Model.)

E. P. WARNER.

METHOD OF MANUFACTURING ELECTRIC CONDUCTORS.

No. 433,917.

Patented Aug. 5, 1890.



Witnesses:

Chas. G. Hawley
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UNITED STATES PATENT OFFICE.

ERNEST P. WARNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

METHOD OF MANUFACTURING ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 433,917, dated August 5, 1890.

Application filed February 2, 1889. Serial No. 298,493. (No model.)

To all whom it may concern:

Be it known that I, ERNEST P. WARNER, 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 the Manufacture of Electric Conducting-Cords, (Case 24,) 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 the manufacture of double-stranded electric conducting-cords; and its object is to produce a cord which shall be of moderate diameter, thoroughly insulated, and at the same time protected from external injury.

My invention consists in making the different strands semi-cylindrical, placing the plane surfaces thereof together, and binding them together, as hereinafter described.

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

Figure 1 is a perspective view of a conducting-cord embodying my invention. Fig. 2 is a transverse section thereof. Fig. 3 is a view illustrative of the manner of compressing the different strands to make them semi-cylindrical and of binding the two strands together. Fig. 4 is a plan view of the compressing-machine. (Shown also in Fig. 3.)

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

I will first describe the product as shown in Figs. 1 and 2. The strands *a* and *b*, as will be seen, are semi-cylindrical, the core of each being preferably tinsel cord or other flexible conducting material, this tinsel being insulated with cotton or other fibrous material. The plane surfaces of these strands are placed against one another and held together by a serving *c*. A coil *d*, of wire, preferably steel wire, is wound about this serving, and serves as an armor to prevent the cores from being injured by external pressure. Over this coil *d* is braided a covering *e*. The double-stranded cord thus constructed is very flexible, is of moderate diameter, and thoroughly protected and insulated.

The method of manufacture will be under-

stood by reference to Figs. 3 and 4. The revolving dies *f* and *g* are semicircular, the rollers being driven by suitable mechanism. The different strands are first made up in the usual manner, each being cylindrical and consisting of a core of tinsel cord or other flexible conducting material insulated with a winding or braiding of cotton or like material. These strands *h i* are run through the revolving dies *f g*, as shown in the same direction and at the same rate, the two strands being brought together face to face and compressed by being passed through a die *k*. As the two cords thus brought together are drawn through the die *k*, they are bound together by a serving *c*. The serving *c* alone would, under certain conditions, be a sufficient insulation and protection. I prefer, however, to provide an armor *d*, consisting of a coil of wire wound about the serving *c*, as shown in Fig. 1, this armor being preferably covered with a braiding *e*. I thus produce a double-stranded cylindrical cord, this form, as is well understood, being best adapted for general use, especially upon telephone-exchange switch-boards.

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

1. The method of manufacturing double-stranded electric cords, which consists in making the different insulated strands semi-cylindrical, placing the plane surfaces of the two strands together, and binding them together, substantially as and for the purpose specified.

2. The method of making cords, which consists in compressing the two strands simultaneously into semi-cylindrical form, placing the two plane surfaces against one another, drawing them through a die, and binding them together, substantially as and for the purpose specified.

3. As an article of new manufacture, a cord consisting of two semi-cylindrical insulated flexible conductors, the said conductors being placed with their plane surfaces against one another and bound together by a serving, substantially as and for the purpose specified.

4. As an article of new manufacture, an

electric cord consisting of two semi-cylindrical insulated strands bound together, the plane surfaces resting against one another, in combination with an armor of coiled wire
5 around the serving and a braiding or covering upon the armor, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 6th day of December, A. D. 1888.

ERNEST P. WARNER.

Witnesses:

GEORGE P. BARTON,
ELLA EDLER.