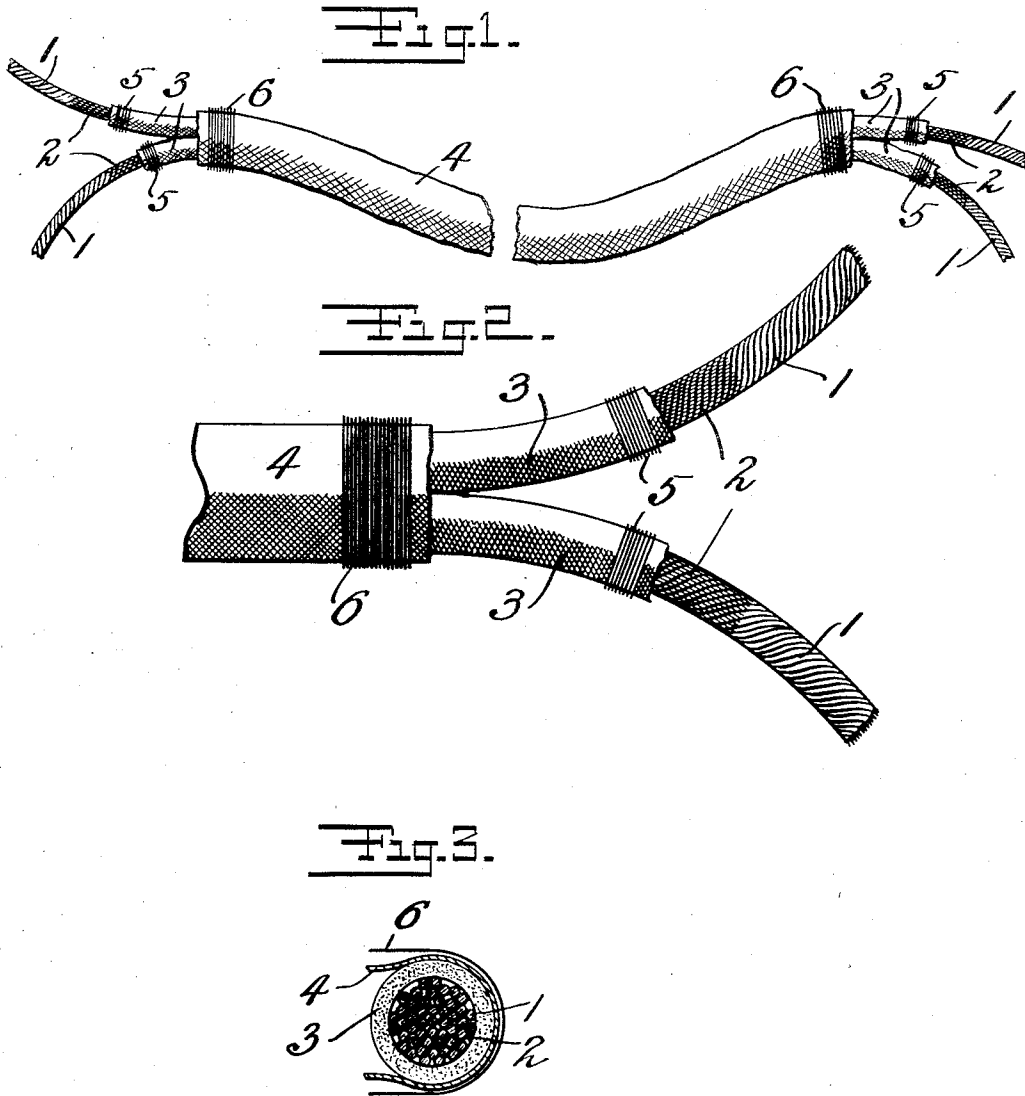


J. C. HENDERSON.
FLEXIBLE INSULATED ELECTRICAL CONDUCTOR.
APPLICATION FILED NOV. 3, 1916.

1,228,670.

Patented June 5, 1917.



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By his Attorneys
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UNITED STATES PATENT OFFICE.

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FLEXIBLE INSULATED ELECTRICAL CONDUCTOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN C. HENDERSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Flexible Insulated Electrical Conductors, of which the following is a full, clear, and exact description.

My invention relates to improvements in insulated electrical conductors. Electrical conductors in which a plurality of conducting portions,—each composed of closely associated wires uninsulated from each other throughout their length and surrounded by a common sheath,—are bound together by an external sheath, are old and my invention has for its object to produce a conductor having a plurality of thoroughly insulated conducting portions, the conducting portions being each made up of a plurality of closely associated conducting wires insulated from one another throughout their intermediate portions and in electrical contact at their ends so as to be in multiple relatively to one another. A further object of my invention is to produce a conductor having sub-divided conducting portions in which there will be no readily combustible material touching the conducting elements. A further object of my invention is to produce a conductor in which the effect of short-circuiting will be localized so that when a short-circuit occurs the conductors will not be put entirely out of commission. A further object of the invention is to produce a flexible conductor, the conducting portions being composed of separately insulated elements and surrounded by a flexible sheath, the sheathed members being surrounded by a common sheath.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawing, in which,

Figure 1 shows a flexible conductor embodying my invention;

Fig. 2 shows an enlarged portion thereof in side elevation; and

Fig. 3 shows an enlarged transverse section.

Referring more particularly to the drawing, 1—1 are conducting portions or cables, each made up of a large number of fine copper wires grouped together, each copper wire being separately coated with a flexible enamel insulation 2 such as japan or ozocer-

ite or the like, applied in liquid form and hardened thereon. Two such conducting portions are separately covered at their intermediate portions with braided asbestos 3, or other fireproof material and two of these asbestos covered cables are bound together with a braided silk or cotton covering 4. The exposed ends of the wires of each cable are uninsulated, the insulating enamel upon the exposed portions having been removed. The ends of the fine wires at these uninsulated portions are brought together so as to be in electrical contact with one another, thus connecting the otherwise insulated conducting elements of each conducting portion in multiple with the result that if by any chance any short-circuiting occurs only a few of the individual strands of each cable are affected, leaving the cable for the most part intact. The ends of the asbestos sheaths are secured by windings 5 and the ends of the outer sheath by windings 6. The wires in each cable are preferably slightly twisted together.

In this conductor all readily combustible material is kept out of contact with the conducting portion. The insulation used is also very resistant to heat. There is no rubber to deteriorate through aging, or decompose through heat or chemical action. The cost of manufacture is low. The covered conducting portions are protected from moisture and corrosion and also from oxidation. There is practically no capillary attraction such as would exist along cotton covered cables of fine naked contacting wires. The conductor is of smaller diameter and radiates heat more readily than conductors of similar capacities heretofore used. The conductor is of less weight. The amount of covering material is small. The conductor has greater flexibility than is the case where the intermediate rubber or cotton coating is employed.

As will be evident to those skilled in the art, my invention permits of various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. An electrical conductor, comprising a plurality of sets of conducting wires, each set composed of a plurality of closely associated conducting wires individually insulated throughout their intermediate portions and free from insulation at their ends, the

adjacent ends of the individual wires of each set being in electrical contact so as to place all the individual conducting wires of that set in parallel, a fireproof sheath for each set surrounding that set individually, and an external sheath surrounding the intermediate portions of all of said sheathed sets.

2. An electrical conductor, comprising a plurality of sets of conducting wires, each set composed of a plurality of closely associated conducting wires individually coated with enamel insulation throughout their intermediate portions and free from insulation at their ends, the adjacent ends of the individual wires of each set being in electrical contact so as to place all the individual conducting wires of that set in parallel, a fireproof sheath for each set surrounding that set individually, and an external sheath surrounding the intermediate portions of all of said sheathed sets.

3. An electrical conductor, comprising a plurality of sets of conducting wires, each set composed of a plurality of closely associated conducting wires individually insulated throughout their intermediate portions and free from insulation at their ends, the adjacent ends of the individual wires of each set being in electrical contact so as to place

all the individual conducting wires of that set in parallel, a fireproof sheath for each set surrounding that set individually, and an external sheath surrounding the intermediate portions of all of said sheathed sets, the insulation and sheaths being flexible.

4. A flexible conductor, comprising two cables covered with a fibrous fireproof sheathing, the cables being made up of fine conducting wires, each separately insulated by enamel except at their ends, the ends of the fine wires of each cable being free from insulation and in electrical contact with one another so as to place all the individual conducting wires of each cable in parallel.

5. A flexible conductor, comprising a plurality of cables covered with a fibrous fireproof sheathing, the cables being made up of fine conducting wires, each separately insulated by enamel except at their ends, the ends of the fine wires of each cable being free from insulation and in electrical contact with one another so as to place all the individual conducting wires of each cable in parallel, and a fibrous sheathing holding said plurality of such sheathed cables together.

JOHN C. HENDERSON.