

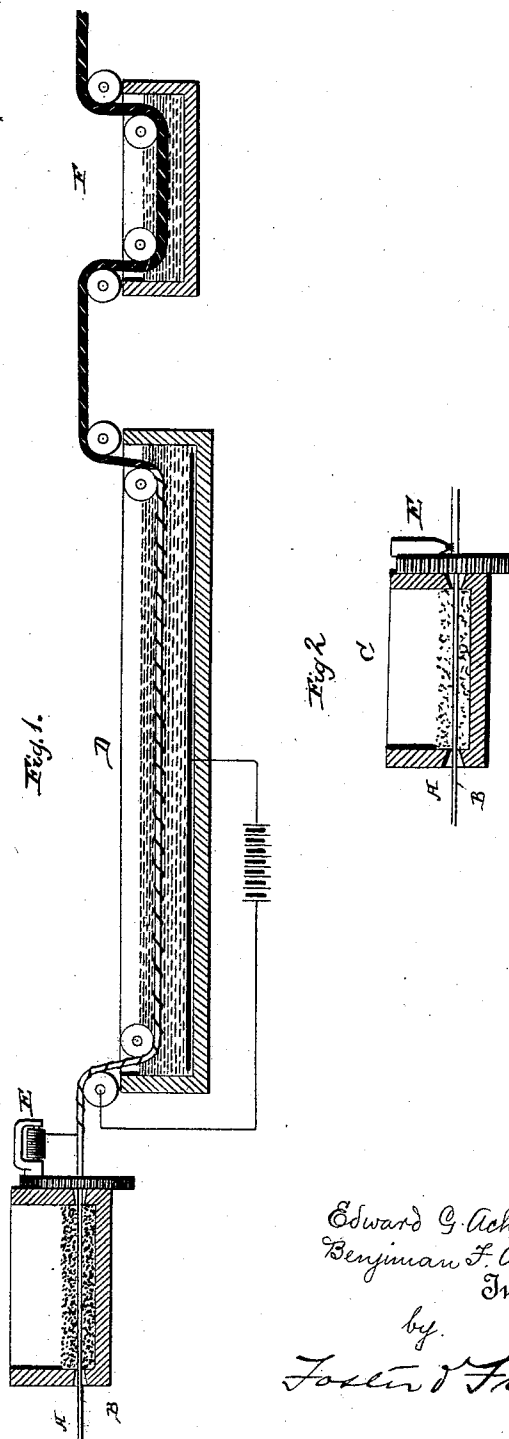
(No Model.)

E. G. ACHESON & B. F. ANDERSON.

MANUFACTURE OF ELECTRIC CONDUCTORS.

No. 380,158.

Patented Mar. 27, 1888.



Witnesses
J. G. Hinkel Jr.
Sidney L. Johnson.

Edward G. Acheson
Benjamin F. Anderson,
Inventors,
by
Foster & Freeman,
Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD G. ACHESON AND BENJAMIN F. ANDERSON, OF PITTSBURG,
PENNSYLVANIA.

MANUFACTURE OF ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 380,158, dated March 27, 1888.

Application filed July 21, 1887. Serial No. 244,911. (No model.)

To all whom it may concern:

Be it known that we, EDWARD G. ACHESON and BENJAMIN F. ANDERSON, residing at Pittsburg, Allegheny county, Pennsylvania, have
5 invented certain new and useful Improvements in the Manufacture of Electric Conductors, of which the following is a specification.

Our invention relates to the manufacture of electrical conductors; and it has for its object
10 to produce a cheap and effective conductor that is not subject to the inductive disturbances due to neighboring electric currents, or that may be used as a return or complete metallic circuit, and one that at the same time
15 will be flexible and capable of being bent and twisted without danger of injury.

To these ends our invention consists in the method of manufacturing electrical conductors, substantially as hereinafter set forth.

20 Prior to our invention a conductor has been made consisting of a primary-line wire covered with some insulating material over which has been applied a shield or covering of metal, and this metal has been applied to the insulated conductor by electrolysis. The metal
25 shield or covering as thus applied, while furnishing a perfect conductor or shield, is subject to some mechanical objections, principal among which is the lack of flexibility and the danger of rupturing the covering or shield when the conductor is bent or twisted, as is often desirable in using the same. If the bend in such a conductor is too great, the covering or shield is liable to crack on the outside
30 of the bend, and such cracks generally being transversely to the conductor are liable to interfere with the conducting qualities of the covering, as well as to interfere with the perfect insulation of the primary conductor. In
35 order to overcome this objection, we make a conductor with a covering or shield having spiral grooves extending partially or wholly through the same, so as to allow the conductor being easily bent without danger of destroying
40 the continuity of the conducting shield or covering or injuring the insulation; and our invention relates to the manner of producing such spirally-grooved covering by electrolysis.

While various means may be used in carrying out our invention, we have illustrated in

the accompanying drawings one form of apparatus that we have found cheap and effective, in Figure 1, and Fig. 2 is a detail of a modification.

The primary conductor A, after being coated
53 in any desired manner with any proper insulating material, B, but preferably some material having a comparatively high melting-point, as asphaltum, is passed through a box, C, containing powdered graphite, or equivalent, that will adhere to the insulating covering and furnish a good surface for the electrical deposition of metal. The conductor as thus prepared is subjected to the action of an electrolytic bath, D, in the usual manner, and we
60 have shown a comparatively long bath, through which the prepared conductor passes continuously, receiving the deposit of metal as it moves through the electrolyte. This operation would cover the insulated conductor with
65 a uniform coating of deposited metal, and in order to form spiral or other grooves in the covering it is only necessary to "stop out" the deposition partially or wholly, and this may be done in various ways.
70

75 We have shown at E a device carrying a spool of thread, which is revolved around the insulated conductor as it moves along through the device, and which thereby winds a thread or cord spirally around the conductor. This
80 thread or cord should be of some non-conducting material that will act as a resist to the deposition of the metal, and while any ordinary cotton or other thread may be used, we prefer to use a waxed or oiled thread or cord. This
85 thread or cord may be applied to the insulated conductor before it passes into the graphite-box, and then be removed, as it thereby prevents the coating of the insulating material with the plumbago, and therefore the metal
90 will not be deposited from the bath on the uncoated portions; but we prefer to apply the cord after the plumbago coating, as shown in the drawings.

The inclination and size of the spiral groove
95 may be readily determined by the relative rates of rotation of the spool and travel of the insulated conductor and by the size of the thread or cord. When the cord is wound tightly upon the insulated conductor, no metal
100

will be deposited upon the portions covered by the cord; but if the cord is loosely wound over the graphite very little metal may be deposited around and under the inner side of the spiral, and the grooves thereby extend only partially through the deposited coating.

Instead of using a thread or cord, the device E may be made to apply a spiral line of non-conducting material on the insulated conductor that will act as a resist and prevent the deposition of the metal from the bath; and in Fig. 2 is shown one form of device for applying the resist, consisting of a brush holding the liquid resist material carried around the wire as it passes through the axis of the brush-carrier.

The conductor, after receiving its metal covering, may be passed through another vat, F, and receive a coat of paint or japan, and it may then be polished or otherwise treated to finish the conductor, as desired. The conductor thus made has a continuous covering with spiral grooves or recesses that permit of its being bent without danger.

It will be understood that we do not limit ourselves to the mechanism shown, nor to the precise mode of procedure set forth, as it is evident that it can be varied by those skilled in the art without departing from the principle of our invention.

What we claim is—

1. In the manufacture of electrical conductors, the method, substantially as herein set forth, of forming a covering with spiral grooves therein, which consists in applying a resist of non-conducting material upon the conductor and subjecting the conductor to the action of an electrolytic bath.

2. In the manufacture of electrical conductors, the method, substantially as herein set forth, of forming a covering with spiral grooves therein, consisting in winding a thread spirally around the insulated conductor and electrolytically depositing a covering on the conductor.

3. In the manufacture of electrical conductors, the method, substantially as herein set forth, of forming a covering with spiral grooves therein, consisting in applying a spiral of waxed thread to the conductor and subjecting it to an electrolytic bath.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EDWARD G. ACHESON.

BENJAMIN F. ANDERSON.

Witnesses:

M. F. CASSIDY,

WILLIAM H. DILLS.