

July 26, 1927.

1,637,033

D. BASCH

COMPOSITE ELECTRIC CONDUCTOR

Filed June 5, 1925

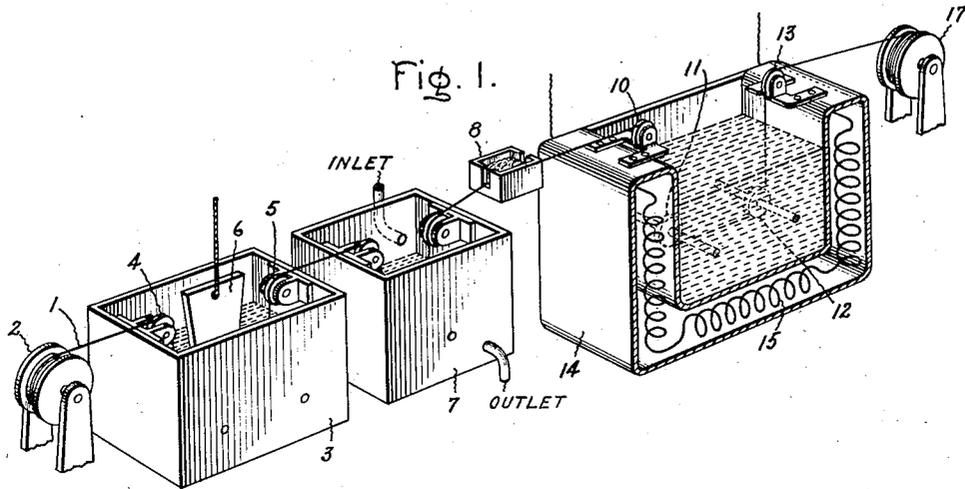
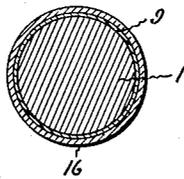


Fig. 2.



Inventor:
David Basch,
by *Myron S. Smith*
His Attorney.

UNITED STATES PATENT OFFICE.

DAVID BASCH, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

COMPOSITE ELECTRIC CONDUCTOR.

Application filed June 5, 1925. Serial No. 35,262.

The present invention relates to the manufacture of aluminum coated copper conductors, and as a consequence of my invention I have provided a conductor in which the core and coating are so well united that they will not separate, and in which the core is not injured or oxidized during the process of manufacture.

Heretofore, when attempts were made to coat copper wire with aluminum, it was found that the copper when brought into contact with molten aluminum became oxidized so that the coating would be imperfect. A tin coating on the copper also became oxidized. Furthermore, molten aluminum alloyed with the copper to such an extent that wire being coated became reduced in diameter, its strength and current carrying capacity were impaired and it was rendered brittle.

In accordance with my invention a non-ferrous foundation metal such as copper is first coated with nickel and then aluminum is applied upon the nickel. No deleterious effects are produced by molten aluminum upon nickel-coated copper.

The accompanying drawing shows in Fig. 1 somewhat diagrammatically an apparatus suitable for carrying out my invention, and in Fig. 2 shows in enlarged cross-section a conductor embodying my invention.

As shown in Fig. 1, copper wire 1 may be drawn from a reel or spool 2 through an electroplating device 3 where the wire is coated with nickel in the usual way. The wire passes over suitable guides, two of which are shown at 4 and 5, and it functions as cathode in the plating bath in conjunction with an anode 6.

Electrical contact to the wire is made through the reel 2, or in any other suitable way. The concentration and character of the nickel plating bath and the rate of progression of the wire through the bath

will depend on the size of the wire and other conditions. After emerging from the plating cell 3 the wire passes through a washing tank 7 and then through a wiper 8 where excess moisture is removed.

The wire which has been coated with a layer of nickel 9 is then passed over rotatable guides 10, 11, 12 and 13 into a bath of molten aluminum contained within the tank 14 which is maintained at the fusion temperature of aluminum by an electric heater 15. The travel of the nickel-coated wire through this bath is maintained at such a rate that the desired coating of aluminum 16 is deposited on the nickel coating 9 as indicated in Fig. 2. The wire is finally wound upon a reel 17.

In some cases the coating of aluminum to advantage may be applied by heating the nickel coated wire in contact with a charge of powdered aluminum and oxide of aluminum, as described, for example, in Van Aller Patent No. 1,155,974 of October 5, 1915.

The conductor finally may be chemically treated to form insulating coating comprising a hydrated aluminum oxide on its surface according to well known methods.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. An article of manufacture, comprising a foundation metal, a coating of nickel thereon and a coating of aluminum superimposed on said nickel coating.

2. An electrical conductor comprising a core of copper, a sheath of aluminum and an intermediate film of nickel.

3. An electrical conductor comprising a core of nonferrous metal, a sheath of aluminum, and an intermediate coating of nickel.

In witness whereof, I have hereunto set my hand this 4th day of June, 1925.

DAVID BASCH.