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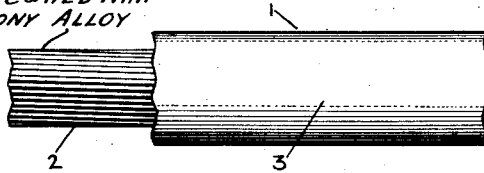
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PROTECTIVE COATING FOR COPPER WIRES

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COPPER WIRE COATED WITH
LEAD-TIN-ANTIMONY ALLOY



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UNITED STATES PATENT OFFICE

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PROTECTIVE COATING FOR COPPER WIRES

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The copper wires of rubber insulated conductor cores are, as a rule, coated with a protective layer of tin, to prevent a reaction between the copper and the sulphur of the rubber, and the consequent deterioration of the copper and rubber coating. Since tin is a comparatively expensive raw material, it has been suggested that instead of the pure tin coating, a coating of a tin-lead alloy be employed. However, tin-lead alloys have the disadvantage that with primary separation of lead crystals, the latter, owing to their slight degree of hardness, or insufficient smoothness, do not adhere sufficiently tightly to the wire during working. This has had the effect that, in the production of wire cable, the dies employed become badly smeared. This defect may assume such dimensions, that the wire will not pass through the die, and will break in the working. In addition to this, wire coated with an alloy of this kind can be soldered only with great difficulty.

The novel features which are characteristic of the present invention are set forth with particularity in the appended claims. The invention itself however will best be understood from reference to the following specification when considered in connection with the accompanying drawing in which the single figure represents an insulated wire core embodying the features of the present invention.

Referring more particularly to the drawing, I have indicated at 1 a conductor cable the core of which consists of a plurality of spirally wound wires 2 each of which is coated with an alloy in accordance with the present invention. The spiral strands of wire are covered with rubber insulation 3.

According to the present invention the disadvantages of a tin-lead coating are avoided by the use of a protective coating consisting substantially of about 40%–90% lead, about 5%–15% antimony and the remainder tin. The antimony serves to increase the hardness of the alloy. Furthermore, a very smooth coating is obtained and consequently any smearing of the dies and breakage of the wire, when being worked, is avoided. In addition to this, a wire coated with the above alloy may be soldered readily. With a tin content in the alloy of less than 50% the content of antimony preferably should amount to at least 5%; with a decreasing tin content a slight increase of antimony is desirable to attain the best results. Satisfactory results have been obtained with alloys of 40% tin and 5% to 15%

of antimony and the remainder lead. Very good results have been attained with alloys having more than 7.5% antimony, 20%–40% of tin and the rest lead. By the addition of antimony, the total percentage of the expensive constituent parts (antimony, tin) may be reduced greatly so that the total alloy will not be more expensive than a tin-lead alloy although simultaneously showing substantially better properties.

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

1. An insulated wire comprising a plurality of copper conductors, said conductors having a protective metal coating thereon said coating containing about 40% to 90% lead, about 5% to 15% antimony with the remainder substantially tin.

2. A rubber insulated electrical conductor comprising a plurality of copper wires having a protective coating thereon said coating containing about 5% to about 15% antimony, about 40% tin, and the remainder substantially lead.

3. A rubber insulated electrical conductor comprising a plurality of copper wires having a protective coating thereon, said coating containing about 15% antimony, an appreciable quantity but not more than about 40% tin with the remainder lead.

4. An electrical conductor comprising a copper wire having an outer insulating coating containing rubber and an intermediate protective adherent coating consisting of a lead, tin, antimony alloy.

5. An electrical conductor comprising a copper wire having an outer insulating coating containing rubber and an intermediate protective adherent coating consisting of an alloy containing about 40% to 90% lead, about 5% to 15% antimony with the remainder substantially tin.

6. A stranded electrical conductor, each of the strands of said conductor comprising a copper core having a coating of a lead-tin-antimony alloy thereon and a coating of rubber on said conductor.

7. In an insulated electrical conductor which consists of a copper core, an outer rubber insulating coating and a metal coating intermediate said core and rubber coating, an intermediate metal coating which consists of an antimony-lead-tin alloy containing 5 to 15% antimony, an appreciable quantity but less than 50% tin with the remainder lead.

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