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METALLIC CEMENT FOR ELECTRIC-CONDUCTOR JOINTS.

SPECIFICATION forming part of Letters Patent No. 657,910, dated September 18, 1900.

Application filed February 3, 1900. Serial No. 3,814. (No specimens.)

*To all whom it may concern:*

Be it known that I, WILLARD F. BARBER, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Metallic Cement for Electric-Conductor Joints, of which the following is a specification.

My invention relates to a metallic cement intended to be used in the place of solder for the purpose of forming electrical connections between wires or other conductors.

In order to make good electrical connections between the adjoining ends of wires used as electrical conductors, especially in electric lighting and power circuits, it is customary to first twist or otherwise bind the ends of the wires together in order to make a joint having the required mechanical strength and then to apply solder to this joint for the purpose of making a continuous metallic circuit of low resistance. In order to apply the ordinary lead and tin solder, it is necessary to use a furnace and soldering-irons, and a considerable amount of time is consumed in the operation. On account of the time and labor required in applying the solder the work is frequently neglected by the linemen and inside wiremen, and the joints are made by simply twisting the wires together, no solder being used. The result is a joint, which is of high resistance compared with one which is properly soldered, and the resistance of this joint increases as the surfaces of the wires become oxidized. The resistance of such joints causes heating and a loss in voltage, and in the case of joints having very high resistance, fires are apt to result.

The cement which forms the subject of my invention may be applied to the joints by hand after the wires are twisted or otherwise mechanically secured together without the use of heat, and for all practical purposes takes the place of solder. The cement consists of an amalgam, with which is mixed a suitable binding material, the mass thus formed having about the consistency of putty. When put up in stick form or in mass, the cement will not harden, except at the surface, where a slight crust is formed, and when the mass is worked between the fingers it be-

comes soft and plastic, so that it may readily be applied to the wires. In making a joint the wires are first twisted or otherwise mechanically secured together, and the joint thus formed is then coated with the cement, the latter being applied with the fingers. The cement being an amalgam adheres to the wires, and the binding material, which forms a small proportion of the cement, causes the layer of cement upon the joint to harden to some extent after exposure to the atmosphere.

In carrying out my invention I form an amalgam preferably consisting of the following ingredients in the proportions specified, the parts being given by weight: zinc, four parts; tin, two parts; copper, two parts; cadmium, two parts; bismuth, four parts; lead, two parts; antimony, one part, and mercury eight parts. The solid metals are granulated and melted together, after which the mercury is added, the mass being stirred at the same time. When cool, the mass is pulverized in a mortar, and a binding material, consisting of liquid glucose and silicate of soda, in sufficient quantity to bind the mass together and give it the consistency of putty, is added to the mass and thoroughly incorporated therewith. The binding material preferably consists of equal parts of the ingredients mentioned. The cement thus formed, as previously stated, will not harden when in bulk and may easily be worked between the fingers; but when spread out upon a joint, it not only adheres to the latter, but hardens in from twelve to twenty-four hours. The cement may be applied to the wires without any previous application of acid, and by amalgamating with the conductors it forms as perfect an electrical union as could be formed by the application of solder without the inconvenience attending the application of the latter. The application of the cement prevents oxidation of the wires. After the joints are thus made they are covered with an insulating-tape in the usual manner.

While after considerable experimenting I have found the amalgam and the binding material described above to form a more satisfactory cement than any other, yet other compositions may be employed with fairly satisfactory results. Either the amalgam or the

binding material, or both, may be varied without departing from the spirit of my invention.

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

1. A conducting-cement consisting of an amalgam and a binding material.
2. A conducting-cement consisting of an amalgam and a binding material consisting of glucose and silicate of soda.
3. A conducting - cement comprising an amalgam consisting of zinc, tin, copper, cadmium, bismuth, lead, antimony and mercury, and a binding material.
4. A conducting - cement comprising an amalgam consisting of zinc, tin, copper, cad-

mium, bismuth, lead, antimony and mercury, and a binding material consisting of glucose and silicate of soda.

5. A conducting - cement comprising an amalgam consisting of zinc, tin, copper, cadmium, bismuth, lead, antimony and mercury, substantially in the proportions set forth and a binding material consisting of glucose and silicate of soda.

In testimony whereof I affix my signature in presence of two witnesses.

WILLARD F. BARBER.

Witnesses:

M. H. MCANIFF,  
WM. C. OLDS.