

# UNITED STATES PATENT OFFICE.

TRUMAN J. PEARCE AND MELVIN W. BEARDSLEY, OF OAKLAND, ASSIGNORS  
TO THE PARAFFINE PAINT COMPANY, OF SAN FRANCISCO, CAL.

INSULATING WIRE AND CONDUCTORS FOR ELECTRICAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 348,994, dated September 14, 1886.

Application filed March 21, 1885. Serial No. 159,879. (Specimens.) Patented in England February 5, 1885, No. 1,604; in France March 30, 1886, No. 162,442, and in Belgium March 30, 1886.

*To all whom it may concern:*

Be it known that we, TRUMAN J. PEARCE and MELVIN W. BEARDSLEY, citizens of the United States, residing in the city of Oakland, Alameda county, State of California, have invented certain new and useful Improvements in Insulating Wire and Conductors for Electric Purposes; and we do hereby declare that the following is a full, clear, and exact description of our said invention and of the manner in which we produce, apply, and carry out the same.

Our invention relates to improvements made in coating or covering wires and conductors for electrical purposes with an insulating water-proof and weather-proof compound.

We have discovered that by coating or covering the surface of wires and conductors for electrical purposes with a mixture of bisulphide of carbon and maltha, as hereinafter specified, a protecting surface or covering will be produced and obtained that is both an excellent protecting medium against the action of water and moisture and the influences of the weather and an efficient insulator of the wire or conductor from other surrounding conducting surfaces or objects. The compound itself is new, and it may be made with many variations of its incidental qualities, such as are common to other substances, and yet all of the newly-found characteristics which are peculiar to itself will be preserved. Upon the compound itself Letters Patent have been granted to us, No. 338,868, dated March 30, 1886, and the formula given in said Letters Patent is employed by us in this invention when found applicable.

The following is a description of the mode in which our compound should be prepared for producing and carrying out our said invention; but we would not be understood as limiting ourselves thereto, as the proportions may be varied to make a thicker or a thinner composition.

It is better to make our new compound thicker for some purposes—such, for instance, where the electrical wire or conductor is to be laid or embedded in a trough or trench underground or in wooden or metal conduits—than it should

be when it is intended to be applied as a coating or covering to the wire or conductor either alone or in connection with a wrapping or covering of textile or fibrous material around the wire or conductor. On account of this fact we will herein specify enough of the various proportions in which the bisulphide of carbon should be mixed with maltha, in order to make the compound of any desired consistency and quality, to illustrate the nature of the mixture and enable persons skilled in the art of covering electric wires and conductors and producing insulated conductors of the kind to make any grade desired of the compound which the bisulphide of carbon and maltha is capable of producing when mixed together, both when other substances are and when they are not mixed in the compound.

We make the compound very limpid by combining forty (40) parts of bisulphide of carbon and sixty (60) parts of maltha. We also make the compound extremely heavy and stiff by mixing twenty-five (25) parts of bisulphide of carbon with twenty-five (25) parts of refined maltha and twenty-five (25) parts of refined asphalt. This mixture is as thick in consistency as could well be applied with a brush; but the form of composition which we prefer to use is produced by mixing together sixty-six (66) parts of refined maltha and thirty-four (34) parts of bisulphide of carbon, as we find those proportions give satisfactory results. This form of the mixture is recommended both for coating the wire and for treating the wrapping or fibrous covering. By using a larger proportion of maltha than any herein mentioned the compound can be made so nearly solid that it can be applied with a trowel or similar instrument. All the proportions herein given are intended to be ascertained by weight.

In this compound the various well-known properties of various substances are employed to produce their natural effects—as, for instance, asphalt tends to make the compound more tenacious and adds body to it. Sulphur furnishes hardness and smoothness of surface, but makes it more brittle when it becomes dry. Rosin tends to make the com-



pound flow more freely, and also adds hardness to it. Paraffine makes it more elastic and pliable. Therefore, when desirable to give the compound special characteristics for special purposes, a proportion may be added to the compound of any of these substances.

In proceeding to carry out our invention we form a covering upon the surface of the wire by applying the compound in a coat or in successive coats laid one upon the other directly to the wire and either by spreading it upon the wire by means of brushes or suitable implements in such manner as to produce an even coating of uniform thickness, or, as will be found the more practicable in treating a considerable length of wire, by running the wire through the compound. In this operation the apparatus can be of the character used for coating wire with other substances and materials; but where the wire is to be used in situations exposed to rubbing contact with surfaces and objects, and be subject to abrasion, and where a covering for cables and submerged wires is required, we employ fibrous or textile material or a braided covering, which we thoroughly saturate and coat with the compound. In such cases we apply a layer or coating of the compound to the surface of the wire, and then wrap the woven or fibrous material around the wire, either saturating it at the time of wrapping or immersing the wire in the compound after being wrapped with the covering. In applying the braided covering we follow the same course, either saturating the cord or yarn at the time of braiding or immersing the covered wire in the compound until thoroughly soaked. In laying electric wires underground or in troughs, trenches, or conduits, or in other ways where they are designed to lie permanently, we apply the compound of a thicker character or consistency, so that the wire is embedded in and covered by the compound. That form of the compound before described as of a thicker or stiff consistency would be serviceable, it being understood that such form of the compound is produced by changing the proportion of the maltha in the mixture. In proceeding to pro-

duce any of the forms of our said compound we first eliminate any dirt and objectionable matter in the maltha, and in doing this we take care to avoid forming any particles of coke or solid matter into carbon particles by refining the maltha at low temperature. The covering thus applied and produced will be found to be both an effective insulator and a complete protective against the elements. It will be found, also, to resist the action of acids and alkalies, excepting concentrated sulphuric acid.

The compound can be applied at normal temperature, and when applied will form a firm tenacious coating and surface. The covering is tough, strong, and pliable, it does not harden or crack, and does not impair the pliability of the wire. The process of coating the wires is carried on at normal temperature, neither the wire nor the mixture being heated. The coating is not affected by extremes of heat or cold, nor by moisture in any form, nor by acids, alkali, or saline influences with which it would come in contact in ordinary conditions of use. It is also non-conducting in a very high degree. The good effects named are due to the character of the mixture which forms the coating.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A wire or conductor for electrical purposes having its surface covered or coated by or enveloped in a compound formed by the mixture of bisulphide of carbon and maltha, substantially as and for the purposes herein set forth.

2. The combination, with a wire or conductor for electrical purposes, of an insulating protecting covering formed of bisulphide of carbon and maltha in mixture, and either with or without a wrapping or covering of fiber, applied substantially as herein set forth.

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Witnesses:

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