

UNITED STATES PATENT OFFICE.

EDWARD J. DE SMEDT, OF WASHINGTON, DISTRICT OF COLUMBIA.

INSULATING OR NON-CONDUCTING BITUMINOUS COMPOUND FOR ELECTRICAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 239,466, dated March 29, 1881.

Application filed February 19, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, EDWARD J. DE SMEDT, of Washington city, in the District of Columbia, have invented certain new and useful Improvements in Insulating or Non-Conducting Bituminous Compounds for Electrical Purposes, of which the following is a specification.

It is my aim to obtain a cheap, easily applied, efficient, and durable non-conducting or insulating material for electrical purposes generally, but particularly for use as or in a covering, sheath, or coating for telegraph-wires. Coal-tars and heavy oils of petroleum, whether natural or the residuum resulting from the distillation of petroleum, are known non-conductors of electricity, and are cheap and easily obtained in large quantity; but in use they deteriorate, their relatively quick destruction and deterioration being due, in part, to the evaporation of certain volatile constituents, but mainly to their gradual oxidation under the natural influences to which they are subjected during their period of use. Oxidation beyond a certain point brings the material to a condition in which it is brittle and easily disintegrated, and this is fatal to the efficiency of the material as a non-conducting covering. A further objection as regards heavy petroleum-oils is that in their ordinary condition they have no adhesiveness. In order to obviate these difficulties I subject said products, when heated so as to be brought to the proper state of fluidity, to the action of an oxidizing agent, or an agent which will readily give up its oxygen to the same when brought in contact therewith. The result is that I obtain an oxidized hydrocarbon product possessing adhesiveness, great tensile strength, and impermeability, resulting from lack of affinity for moisture, qualities which combine to render the oxidized hydrocarbon product particularly valuable for use as an insulating coating or covering for telegraph-wires, the material not being at all brittle, and, owing to the oxidizing process to which it has been subjected, preserving its condition practically unimpaired during its period of use, whether the wire on which it, or the covering of which it forms part, is deposited, be suspended in the air, submerged in the water, or buried in the earth.

In order to oxidize the coal-tar product I employ the process described in my Letters Patent No. 236,995 of January 25, 1881, and to oxidize the heavy oils of petroleum I make use of the process described in my Letters Patent No. 237,662, of February 8, 1881. The oxidized hydrocarbon product thus obtained is available for use as an insulating or non-conducting coating or covering for telegraph-wires and other conductors of electricity. It can be used alone or intermingled or combined with other suitable substances or materials used for coating, sheathing, or covering telegraph-wires, and may be applied in any suitable way, according to the conditions of its use. The coating thus obtained will be flexible, tough, and impervious to moisture, and will remain practically unaffected by the natural influences to which it may be subjected during its period of use. In case it should be desired, in order to protect the wire from abrasion, or for other reasons, to sheath the wire with fibrous or other covering the oxygenated hydrocarbon hereinbefore described may be applied in any suitable way to the wire, to the fibrous or other material of which the sheath is composed, or to the exterior of the sheath. In fine it may be used in any of the ways in which other non-conducting compounds have heretofore been used as or in a covering or coating for telegraph-wires.

I am not necessarily restricted to the particular degrees of heat specified in my aforesaid Letters Patent. The modes of treatment therein set forth answer the purpose well; but, in so far as the oxidizing feature is concerned, only so much heat is needed as will put the material in a sufficiently liquid condition to enable the oxidizing agent, such as the pyric or permanganic acids named in my aforesaid Letters Patent, to properly mix and unite with it; and, on the other hand, I can raise the heat to any desired extent—the higher the heat the more of the oxidizing agent will the material take, and, beyond a certain point, the harder and less ductile will the product be. The process, however, should never, for the purposes which I have here in view, be carried to a point at which the product will become brittle or will have its toughness and tenacity impaired.

I remark, in conclusion, that I can employ the hereinbefore-described process of treating heavy oils of petroleum for the treatment of what are known as "liquid asphalts" in order
5 to bring them to a condition in which they may be available for the uses herein contemplated. Liquid asphalt in its natural state is too thin and has too little coherency. It cannot be evaporated so as to thicken it to the
10 proper degree without materially reducing its bulk, and at the same time rendering it brittle; but by treating it with an oxidizing agent, such as picric or permanganic acid, while under the influence of heat sufficient to bring
15 it to a condition in which it will readily receive and combine with the agent, and then by subsequently raising the heat, if need be, in order to drive off any light oils which should not remain, I produce a homogeneous oxidized
20 hydrocarbon product which, while thickened

and tough, has lost but little, if anything, in bulk.

Having described my invention, what I claim and desire to secure by Letters Patent is—

1. The application and use of the hereinbefore-described oxidized hydrocarbon product
25 for insulating or covering telegraph-wires and other electrical conductors, substantially as set forth.

2. Telegraph-wire coated with or incased
30 in the herein-described oxidized hydrocarbon product, whether used alone or in conjunction with other substances or materials.

In testimony whereof I have hereunto set my hand this 19th day of February, 1881.

E. J. DE SMEDT.

Witnesses:

E. A. DICK,
N. O. LANE.