

# UNITED STATES PATENT OFFICE.

WILLIAM T. HENLEY, OF PLAISTOW, COUNTY OF ESSEX, ENGLAND.

## MODE OF INSULATING ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 239,776, dated April 5, 1881.

Application filed February 2, 1881. (No specimens.) Patented in England November 26, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM THOMAS HENLEY, of Plaistow, in the county of Essex, England, have invented new and useful Improvements in the Mode or Modes of Insulating Electrical Conductors, applicable to all telegraphic and telephonic purposes, (for which I have obtained a patent in Great Britain dated 26th November, 1875, No. 4,115,) of which the following is a specification.

My improvements in the mode or modes of insulating the conductors used in submarine telegraph-cables and for other telegraphic and telephonic purposes, consist in first covering the tinned-copper conducting wire or wires with india-rubber and india-rubber compound in the same way as used in that known as "Hooper's" core, and then vulcanizing the india-rubber covered conductor in ozocerite, paraffine, or other similar hydrocarbons. For this latter purpose I use a double vessel or steam-jacketed cylinder, the outer vessel or jacket only being charged with steam, the inner, in which the core is placed, being charged with the hot ozocerite, paraffine, or other similar substance, which is heated by the steam in the jacket.

The paraffine may be subjected to pressure by means of a force-pump; but the vapor of the paraffine in the "cure" will exert sufficient pressure. I prefer using more sulphur in the outer coating of india-rubber compound of the core than when cured in the ordinary way; or, after the core is cured in the usual way, by high-pressure steam, then I completely dry all the moisture out of it by any ordinary means, or place it in the steam-jacketed cylinder for that purpose, and when quite dry the core is placed in a vessel with heated ozocerite or other similar hydrocarbon, until the pores are thoroughly closed, the core becoming much larger by the amount of ozocerite absorbed. The vessel may be heated by steam or other means. When thus heated the inductive capacity is much decreased, and the speed of telegraphing consequently much increased. Instead of heat-

ing the ozocerite by steam, it may be heated in any other way in an ordinary vessel with fire under it, and it may be treated in the heated ozocerite without being previously dried after curing, as the hot ozocerite will dry out the moisture and take its place; but I prefer the core being previously dried.

The advantages of thus treating the india-rubber core are: Vulcanized india-rubber, as at present manufactured, slowly absorbs water, and thus loses its insulating properties, and when used where it is alternately wet and dry this absorption takes place very rapidly, and the core, in the course of two or three months, becomes quite useless. This has been found to be the case invariably when laid under ground, and in the parts of shore-end cables, where subject to the ebb and flow of the tide, and a gutta-percha-covered wire becomes deteriorated when placed under ground, not through absorbing moisture, but from becoming dry or oxidizing.

No material of which I am aware has as yet been found suitable for subterranean lines of telegraph or telephone; but by these improvements india-rubber core can be made which shall remain perfect for any length of time, whether used for land or sea lines.

I claim—

1. The improvements in the mode or modes of insulating telegraph or other electrical conductors for telegraph-cables, telephones, and other purposes, consisting of the combined process of first covering the wires with india-rubber and then vulcanizing the same in ozocerite, paraffine, or similar hydrocarbon, as set forth.

2. The employment of ozocerite or equivalent hydrocarbon for vulcanizing insulated telegraph and telephone conductors, as set forth.

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