

UNITED STATES PATENT OFFICE

ISADOR LADOFF, OF CLEVELAND, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF FIFTEEN ONE-HUNDREDTHS TO WALTER D. EDMONDS, OF BOONVILLE, NEW YORK, FIFTEEN ONE-HUNDREDTHS TO PHILIP C. PECK, OF NEW YORK, N. Y., AND SEVENTY ONE-HUNDREDTHS TO ANNA M. LADOFF.

ELECTRICAL CONDUCTOR FOR LIGHTING PURPOSES.

1,019,902.

Specification of Letters Patent.

Patented Mar. 12, 1912.

No Drawing. Original application filed January 4, 1904, Serial No. 187,698. Divided and this application filed February 10, 1909. Serial No. 477,204.

To all whom it may concern:

Be it known that I, ISADOR LADOFF, a citizen of the United States, now residing in the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electrical Conductors for Lighting Purposes, of which the following is a specification, my present application being a division of my former, now pending, application, Serial No. 187,698, filed January 4, 1904.

My invention relates to the constitution of that part or parts of an electrical conductor which are adapted to produce illumination when the current is turned on, as for instance the pencils of the arc light.

My researches have demonstrated that certain substances, including metals and their oxids, possess properties, which impart to the electric light, derived from conductors, containing them, exceptional, if not, hitherto unattained, candle power, besides other desirable qualities such as unprecedented whiteness, *i. e.* absence of the red lines objectionable for instance in lights derived from the usual carbon conductors; besides which such conductors so containing the aforesaid substances are much more durable than others previously known.

Types of the substances to which I refer are titanium, also its oxid rutile, also silicon, also its oxid silica, etc. Such substances have hitherto proved unavailable on an industrial scale at least, for the purposes in hand, largely on account of their inadequate electrical conductivity, and they may be classified generally for the purposes of this specification as being substances, including metals, which for the purposes of electric lighting possess exceptional electroluminous but inadequately conductive properties. I have discovered that these substances may be employed in electrical conductors, for lighting purposes, with industrial economy, and with the advantages described, provided they are intermingled in such conductors with another substance, as for instance a metal, possessing the requisite conductivity and stamina to, as it were, support them within and by itself in a state akin to, if not actually of mechanical suspension.

In my pending application, Serial No.

213,065, filed June 18, 1904, being a division of my application, Serial No. 183,528, filed December 2, 1903, I have particularly described the processes devised by me for combining in pencils or electrodes for arc lighting the said oxid of titanium, *i. e.* rutile with iron.

In producing pencils for the arc light comprising the oxid of silicon, *i. e.* silica, substantially the same processes and methods are employed by me, though the proportions may be considerably varied without losing characteristic advantages attributable to the silica, but my experience leads me to conclude that the best results may be obtained from not to exceed 90% of silica and say preferably between 15% and 35%. Arc light pencils so constituted are preferably prepared as follows: The oxid of silicon, silica, is first pulverized and with the resulting powder is mixed pulverized metallic oxid as for instance preferably magnetite. To this mixture is added, and thoroughly mixed therewith, a sufficient quantity of any available binding material, as for instance water, glycerin, tar, linseed-oil, or the like, to impart to the powder adhesion and plasticity, such as to enable the material to be pressed or squirted into the desired form in molds under hydraulic or other pressures in the manner, for instance, in which carbon pencils are now produced for a similar purpose. The resulting pencils are then allowed to dry in the open air under room temperatures for several hours, it being important, as will be appreciated in this art, to avoid a too rapid drying which tends to distort the shape of the pencils. After this preliminary air drying, the pencils are further dried in an oven at a temperature of about 200 deg. C. or thereabout, for a period of about 48 hours. After this the pencils are packed carefully in carbon, and subjected for about two days and two nights to a temperature of from 1200 to 1500 deg. C., after which they are cleaned and thus finished ready for use, care being taken, it will be observed, to expose them as aforesaid to a sufficiently high temperature in the presence of carbon (or carbon monoxid, hydrogen, or any other reducing agent which may be employed) and for a sufficient time to in-

sure substantially complete reduction of the metallic oxid added to the silica as aforesaid, so as to incorporate into and within the body of the pencil the metallic element of such metallic oxid in its elemental state. I do not, however, wish to be limited to the aforesaid particular method of producing my silica-containing pencil, as the same results may obviously be obtained by combining the silica with the more conductive element to be associated therewith in any other way, the essential characteristic of my present invention being the preponderance in an arc light pencil of my said novel mixture of silica with a substance, preferably a metal, more conductive than silica.

I am aware that prior to my invention the suggestion had been offered that desirable results are attainable, from otherwise carbon electrodes, by incorporating into the coke, employed in their production, a small proportion, *i. e.* one to ten per cent., of an infusible, or difficultly fusible, substance, such as silica for example, in order to make the impurities in the coke difficult to fuse and thereby increase the intensity and steadiness of the light from such carbon pencils.

Such use of silica constitutes no part of my present invention which consists in non-

carbonaceous electrodes composed essentially of silica and metal, the light from which is attributable to the so-called flaming or luminous arc proceeding from the cathode, instead of, as in said carbon electrodes, from incandescence of carbon in the crater of the anode.

What I claim as new and desire to secure by Letters Patent is the following, viz:—

1. An arc light electrode consisting essentially of silica associated with metal and characterized as producing a flaming or luminous arc.

2. An arc light electrode consisting essentially of silica associated with iron and characterized as producing a flaming or luminous arc.

3. An arc light electrode containing at least 15 per cent. of silica mixed with metal and characterized as producing a flaming or luminous arc.

4. An arc light electrode containing at least 15 per cent. of silica mixed with iron and characterized as producing a flaming or luminous arc.

ISADOR LADOFF.

Witnesses:

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JOHN R. ORPUTT.