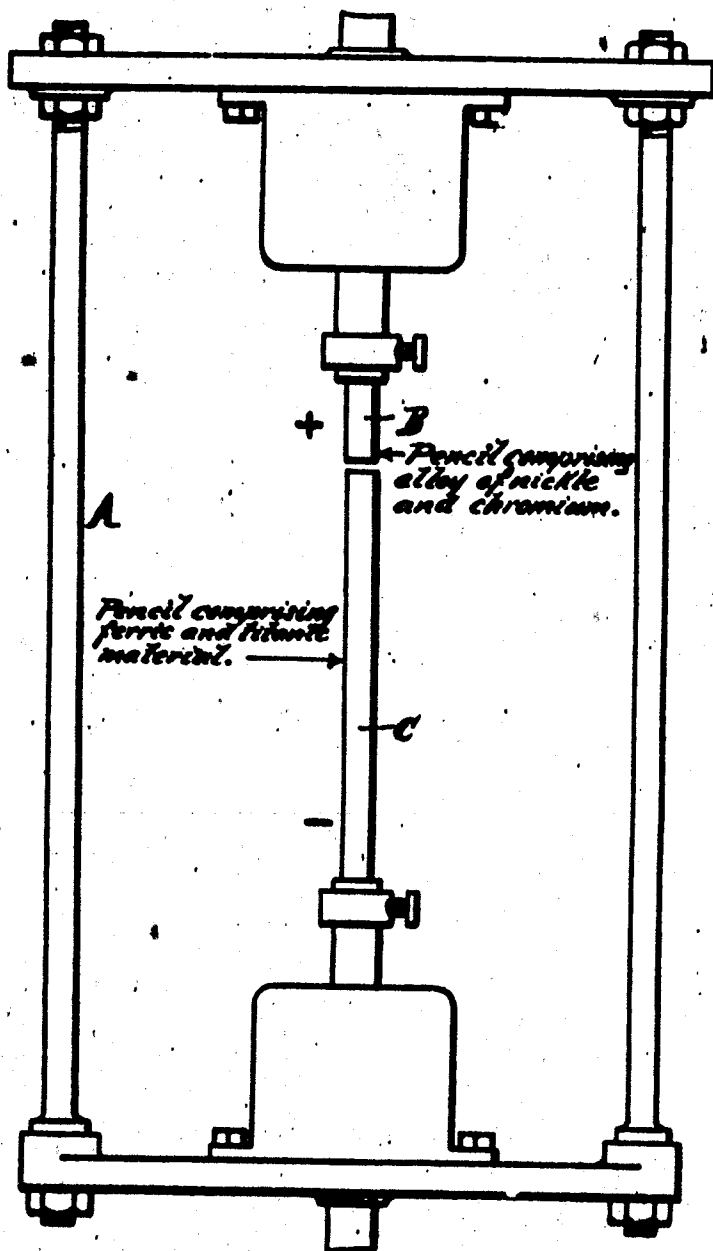


I. LADOFF.
ARC LIGHT ELECTRODE.
APPLICATION FILED SEPT. 14, 1900.

948,936.

Patented Feb. 8, 1910.



Witnesses:
C. A. Jorg
Philip Beck

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by *Wm. L. Smith*
His attorney

UNITED STATES PATENT OFFICE.

ISADOR LADOFF, OF CLEVELAND, OHIO, ASSIGNOR OF THIRTY ONE-HUNDREDTHS TO
PHILIP C. PECK, OF NEW YORK, N. Y.

ARC-LIGHT ELECTRODE.

948,926.

Specification of Letters Patent.

Patented Feb. 8, 1910

Application filed September 14, 1909. Serial No. 517,552.

To all whom it may concern:

Be it known that I, ISADOR LADOFF, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Arc-Light Electrodes, of which the following is a specification, reference being had to the accompanying drawings.

The object of my present invention is to produce, for use in apparatus for producing the arc light, an upper pencil, or anode, which can be more satisfactorily, economically, and efficiently employed than heretofore with a lower or cathode consisting of, or largely containing, ferric and titanic materials. Notwithstanding the many advantages of such lowers, and numerous expedients heretofore devised, mechanical or constitutional, or both, the fact remains that such lowers present, whether in direct or alternating currents, special and difficult problems, as regards welding, flickering of the arc, etc. My researches have demonstrated that the anode, as an upper, and particularly its constitution, plays a most important part in the solution of said problems, and that to overcome the disadvantages incident to use of ferric and titanic materials in large proportions in the lower or cathode is, generally speaking, required an upper, anode, having (1) a very high melting point to overcome welding of the pencils during feeding; (2) a straight line temperature electromotive-force curve to steady the arc; (3) good conductivity at ordinary temperatures; (4) the least possible tendency to oxidize at ordinary temperatures, and (5) the capacity to give off products of oxidation in the arc which are fairly good conductors at ordinary temperatures in order that the arc may be started again readily after its extinction.

By means of prolonged and numerous experiments and tests with a multitude of different substances, variously combined, I have finally discovered that an upper composed of, or containing, predominatingly, the alloy of nickel and chromium, possesses, in much higher degree than any with which I am acquainted, all of the above mentioned, and other, desirable qualities, when burned in the arc lamp in combination with a lower composed of, or preponderatingly containing, ferric and titanic materials, and con-

tributes in consequence in such connection to production of a steadier, more luminous, more continuous, longer-lived, and more easily started arc than heretofore. To said result the peculiar respective characteristic qualities and properties of the said two metals, nickel and chromium, and their respective behaviors in the current, and the qualities and properties of their resultants in the arc when used as anodes in combination with cathodes of ferric and titanic materials, all jointly contribute, the said result being, as I have found, unattainable by either of said last mentioned metals when used alone or in combination with any other available substances with which I am acquainted. I construct my said novel anode out of the alloy of nickel and chromium, various methods of producing which are now well understood by those skilled in the art, as for instance by co-melting nickel and chromium under the high temperatures of an electric furnace, or the said alloy may now be purchased as a well-known article in the market. I either so co-melt nickel and chromium in desired proportions and tap the molten product into molds of the shape required for my said anode, or melt nickel and chromium, in desired proportions, by application thereto of required temperature, in any convenient manner, and after the molten ingredients have been thoroughly conglomerated with each other, by any convenient means, similarly cast the product into said molds. The resistive properties of my pencils may be increased as desired, within limits, by increasing the proportion of chromium.

In arc light systems operated on constant potential lines it will be advantageous to use in my said upper said alloy containing comparatively more chromium than on constant current systems, *i. e.* say from 20% to 50% chromium in the former, and say from 10% to 20% of chromium in the latter, the remaining per cent. being in each instance of nickel. As a guide for usual practice I will say that I have found alloys in which the nickel content varies from 90% to 50% and the chromium content from 10% to 50% to be most effective and desirable.

The constitution, characteristics and behavior of my said novel anode are such that its consumption, when used in the connection mentioned, is extremely slow, being at

the rate of one inch of its length in from 50 to 100 hours according to diameter. Consequently I find it convenient, and preferable, to construct my said anodes in cylindrical form in about the proportion of 11/16 inch diameter by 2 inches long. I prefer the proportions mentioned because the lower, cathode, composed of ferric and titanic materials, employed by me have an average life of approximately 250 hours, and I size my novel anode so as to insure a change of same at each trimming of the lamp.

Referring to the drawings, A indicates an arc lamp of usual form and provided with the usual feed devices, etc., B my said upper pencil or anode composed of or comprising the alloy of nickel and chromium. C the negative pencil or electrode composed of or comprising ferric and titanic materials. The pencils are, of course, to be understood

as connected as usual in circuit with a source of electrical energy not shown.

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

1. In an apparatus for producing the arc light an upper pencil or anode composed of the alloy of nickel with chromium.

2. In an apparatus for producing the arc light an upper pencil or anode comprising a preponderance of the alloy of nickel and chromium.

3. In an apparatus for producing the arc light an upper pencil or anode containing a preponderance of the alloy of nickel and chromium.

ISADOR LADOFF.

Witnesses:

PHILIP C. PECK,
G. G. MEASURES.