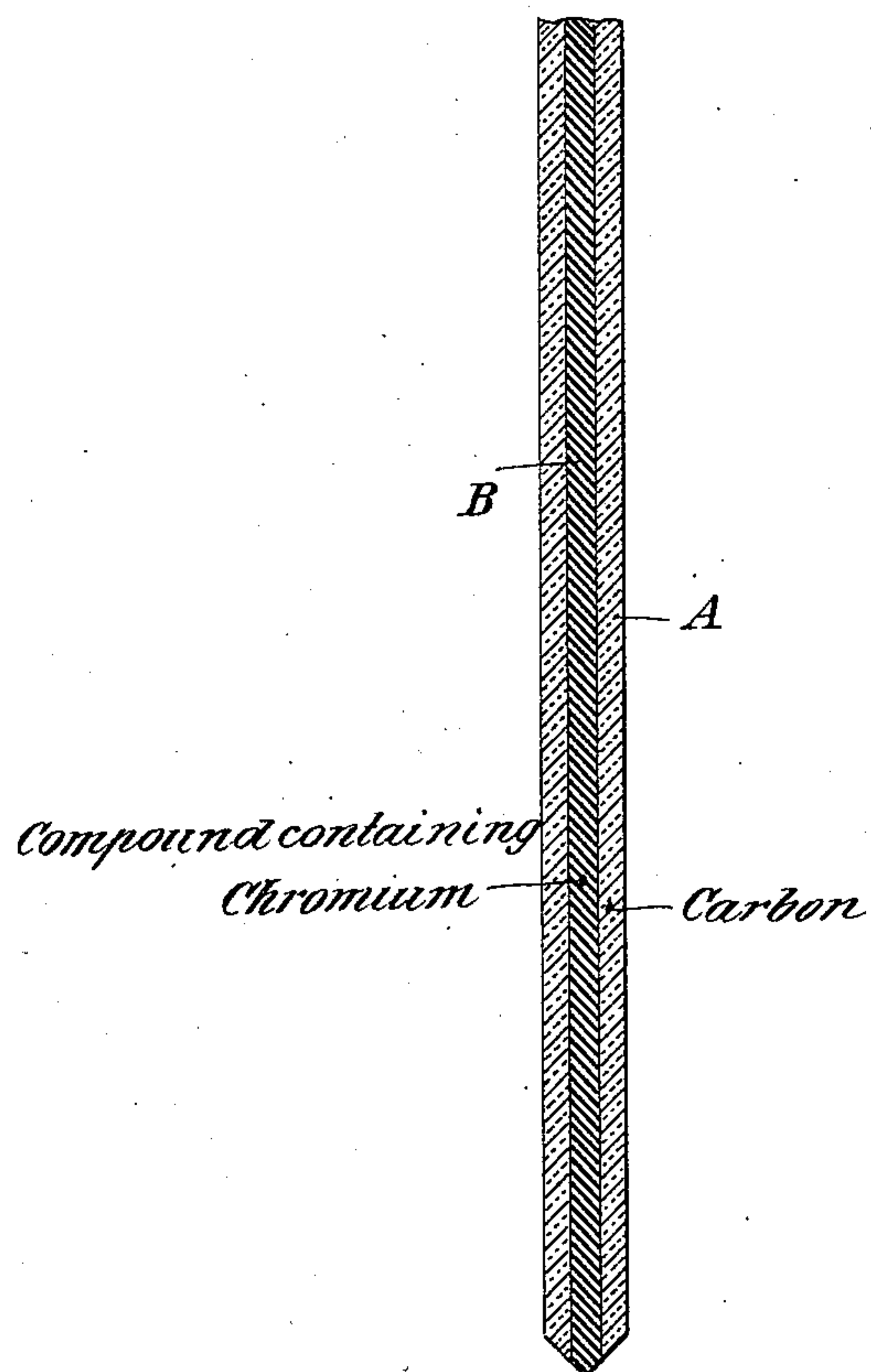


(No Model.)

I. L. ROBERTS.
PENCIL FOR ARC LAMPS.

No. 562,030.

Patented June 16, 1896.



Witnesses:
Raphaël Netter
James M. Catlow

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by *his Attorney*

UNITED STATES PATENT OFFICE.

ISAIAH L. ROBERTS, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ROBERTS-BREVOORT ELECTRIC COMPANY, LIMITED, OF NEW YORK.

PENCIL FOR ARC-LAMPS.

SPECIFICATION forming part of Letters Patent No. 562,030, dated June 16, 1896.

Application filed October 31, 1895. Serial No. 567,478. (No model.)

To all whom it may concern:

Be it known that I, ISAIAH L. ROBERTS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Pencils for Arc-Lamps, of which the following is a full, clear, and exact description.

In prior patents of the United States granted to me on the 6th day of October, 1891, Nos. 460,595, 460,596, and 460,597, I have shown and described certain improvements in arc-lamp pencils based upon the employment of compounds containing chromium with carbon or metal, the invention in its preferred form being embodied in a pencil composed of a metallic holder with a filling of the refractory compound containing the chromium. These patents evidence the extent of my knowledge of the subject under consideration at that date; but I have subsequently made the further discovery that by the substitution for the metal holder of one composed of carbon, such as is ordinarily used in arc-lamp pencils, I secure results which are not only better in degree, but new in kind, while at the same time I am enabled to produce a more economical and practicable pencil.

I am aware of the previous existence of electrodes or arc-light pencils known as "cored carbons," composed of a cylinder of hard-baked carbon, such as is commonly used for arc-light pencils, with a central core composed of various substances, but generally, in practice, of unbaked carbon mixed with other materials to give it the desired consistency. My present application is not, therefore, based on the production of a cored carbon irrespective of the character of its component parts, but on the discovery that a cored carbon containing a compound containing chromium is not only measurably superior in its effects to either the ordinary carbons or the pencils as I have heretofore made them, but possesses unexpected advantages both in light-giving qualities and its property of requiring much less energy in its operation or use.

In carrying out my invention I use an ordinary carbon pencil having a central hole throughout its length of convenient size—say

about one-eighth inch in diameter. I fill this hole with a compound containing chromium. I prefer a compound containing chromate of potash, asphaltum, and pulverized carbon or plumbago.

The proportions of the different substances will vary greatly, depending mainly upon the current used and partly upon the quality of the carbon pencils. When the pencils are to be used with an alternating current, I prefer a compound containing from thirty to fifty per cent. of chromate of potash, twenty per cent. of asphaltum, and the remainder of pulverized carbon. When the pencils are to be used with a continuous current, I prefer from sixty to seventy per cent. of chromate of potash, twenty per cent. of asphaltum, and the remainder of pulverized carbon. In order to get a good mixture of these substances, I pulverize the chromate of potash to a fine powder, mix it with the pulverized carbon and broken pieces of asphaltum in the required proportions, and heat the mass to about the boiling-point of water, stirring it well. The asphaltum will thus be melted and absorbed by the chromate and pulverized carbon. When the mass is cool, I regrind the whole and pack it into the carbons in any convenient manner. The preferred way is to wet the pulverized compound with glycerin to form a paste of the proper consistency and to then force the paste through a nozzle into the openings in the pencils.

The object of the use of chromate of potash instead of other chromates is that the tendency of chromium in the arc is to impart a bluish, greenish tint to the light, while potash produces a pink tint. The colors blend and produce, with carbon, a white light. The objects of using asphaltum are that it will first melt and bind the other substances together, and will then carbonize as the heat advances in the pencil in burning, and thus hold the core firmly in position.

Other chromium compounds may be used and many different-colored lights may be produced, but in all cases there are two new results obtained—namely, a greater amount of light and less consumption of energy than when carbon is used alone as an electrode. I believe that the reasons for these results are

the high conductivity of the chromium vapor and its great luminosity, which is heightened by the vapor of the potassium. Other substances besides asphaltum may be mixed with the chromium compound, my invention being present whenever chromium is contained in the core of an arc-light carbon pencil.

In the drawing hereto annexed a pencil made in accordance with my invention is shown in central longitudinal section.

A is the shell or cylinder of carbon, and B the core, composed of a material containing chromium.

What I claim is—

1. An electrode or pencil for arc-lamps composed of a cylinder or holder of carbon with a core of a material containing chromium, substantially as described.

2. An electrode or pencil for arc-lamps com-

posed of a cylinder or holder of carbon with a core containing a chromium compound associated with a carbonizable substance such as asphaltum, substantially as described.

3. An electrode or pencil for arc-lamps composed of a cylinder or holder of carbon, with a core composed in whole or in part of chromate or bichromate of potash, substantially as described.

4. An electrode or pencil for arc-lamps composed of a cylinder or holder of carbon, with a core consisting of a chromium compound, a carbonizable substance such as asphaltum, and glycerin, substantially as described.

ISAIAH L. ROBERTS.

Witnesses:

ROBT. F. GAYLORD,
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