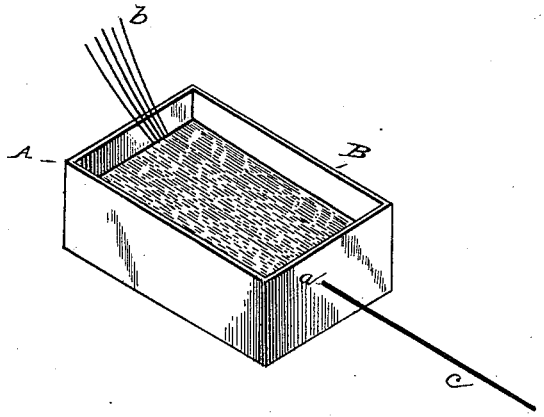
(No Model.)

T. A. EDISON.

MANUFACTURE OF FILAMENTS FOR INCANDESCENT ELECTRIC LAMPS.

No. 470,925. Patented Mar. 15, 1892.



Witnesses
Norris Albeark
H. F. Oberly

Inventor
T. A. Edison.
By his Attorneys
Dyer & Seely.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, NEW JERSEY.

MANUFACTURE OF FILAMENTS FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 470,925, dated March 15, 1892.

Original application filed March 20, 1880, Serial No. 5,864. Divided and this application filed July 2, 1888. Serial No. 278,852. (No model.) Patented in England September 16, 1880, No. 3,765; in Italy November 6, 1880, No. 12,315; in Canada November 11, 1880, No. 11,968; in Belgium November 15, 1880, No. 52,890; in Victoria December 13, 1880, No. 2,936; in Austria-Hungary January 7, 1881; in Queensland February 7, 1881; in New Zealand March 7, 1881, No. 510; in Portugal March 31, 1881, No. 661; in New South Wales April 2, 1881; in Spain April 26, 1881, No. 1,284, and in France June 10, 1881, No. 141,976.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Carbons for Electric Lamps and the Manufacture Thereof, (Case No. 780, division of Case No. 210,) of which the following is a specification, and which has been patented as follows: in Great Britain, No. 3,765, dated September 16, 1880; in Italy, No. 12,315, dated November 6, 1880; in Canada, No. 11,968, dated November 11, 1880; in Belgium, No. 52,890, dated November 15, 1880; in Victoria, No. 2,936, dated December 13, 1880; in Austria-Hungary, T 31, f. 50, dated January 7, 1881; in Queensland, February 7, 1881; in New Zealand, No. 510, dated March 7, 1881; in Portugal, No, 661, dated March 31, 1881; in New South Wales, dated April 2, 1881; in Spain, No. 1,284, dated April 26, 1881, and in France, No. 141,976, dated June 10, 1881.

As before explained in prior applications for patents for inventions of mine relating to lighting by electricity, it is essential that the incandescing conductor should be of high resistance and that great advantages result from the increase of resistance when such increase can be obtained without increase in the extent of the radiating surface. I have discovered that an incandescing conductor of very high resistance in comparison with the radiating surface may be made by taking several exceedingly-fine fibers or filaments of carbonizable material and welding them together prior to carbonization by a suitable cementing carbonizable liquid. For this purpose I prefer to use natural fibers—such as bast, jute, manila, hemp, &c.—or other fibers of endogenous growth made up of a great number of parallel elementary fibers cemented together by a natural cementing material, which on carbonization locks all the elementary fibers together into a homogeneous filament. I take several of these natural fibers, and after removing the extraneous matter by passing them through a cutting-die I form them into a bunch and dip them together into a solution of sugar or other carbonizable liquid and then carbonize them as one fiber, the carbonizable cementing-liquid binding them firmly together into a homogeneous filament of high resistance and moderate radiating surface.

The filament and the method of making it is shown in the accompanying drawing.

A is a suitable receptacle containing the carbonizable liquid B. The receptacle is open at its top. One of its sides is provided with a small hole *a*. A number of fine filaments *b* are taken and their ends passed through the hole *a* from within the box. The filaments are then drawn through the carbonizable liquid, and are thus welded into a compact integral filament *c*, which may be carbonized in any suitable manner.

In my application, (Case No. 210,) Serial No. 5,864, filed March 20, 1880, is described the use of natural fibers for forming on carbonization the incandescing filaments of electric lamps. This application, which is of the division of my prior application, (Case No. 210,) relates to an improvement upon the invention described in that application.

What I claim as my invention is—

1. A filament for forming the carbon incandescing conductor of an electric lamp, consisting of a number of fine filaments welded together by a carbonizable cementing substance, substantially as set forth.

2. A filament for forming the carbon incandescing conductor of an electric lamp, consisting of a number of natural fibers welded together by a carbonizable cementing substance, substantially as set forth.

3. The method of manufacturing incandescing conductors for electric lamps, consisting in uniting by a carbonizable cementing substance a number of carbonizable filaments and then carbonizing the whole, substantially as set forth.

4. The method of manufacturing incandescing conductors for electric lamps, consisting in taking natural fibers, removing therefrom the extraneous matter, uniting a number of such fibers by a carbonizable cementing substance, and then carbonizing them as one filament, substantially as set forth.

This specification signed and witnessed this 21st day of June, 1888.

THOS. A. EDISON.

Witnesses:
WILLIAM PELZER,
A. W. KIDDLE.