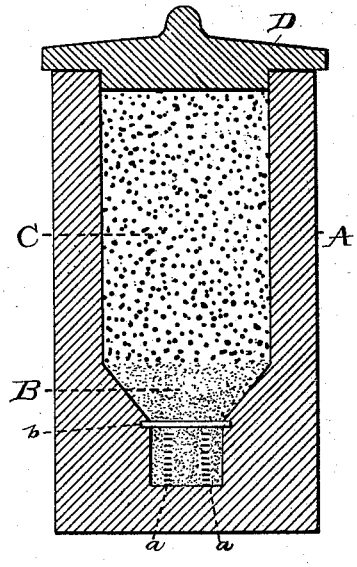
(No Model.)

T. A. EDISON.

MANUFACTURE OF CARBON FILAMENTS.

No. 484,184. Patented Oct. 11, 1892.



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UNITED STATES PATENT OFFICE.

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

MANUFACTURE OF CARBON FILAMENTS.

SPECIFICATION forming part of Letters Patent No. 484,184, dated October 11, 1892.

Application filed October 27, 1886. Renewed March 30, 1892. Serial No. 427,009. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Llewellyn Park, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in the Manufacture of Carbon Filaments, (Case No. 683,) of which the following is a specification.

My invention relates to the carbonizing of filaments for the production of incandescent conductors for electric lamps. In this process it is necessary to keep the filaments under strain or pressure, so that they will not change their shape during carbonization.

The object of my invention is to provide the necessary pressure in a simple and efficient manner and to dispense with the use of the molds or forms and weights which have heretofore been used to maintain the filaments in shape. I accomplish this by placing the carbonizable filaments in a suitable chamber and placing above and around them a quantity of lead or other fusible metal, which when the chamber is placed in the carbonizing-furnace will melt, and the filaments will then be subjected to the pressure of a liquid column formed by the melted metal. After carbonization the lead is poured out before it has time to solidify, and the filaments are then removed.

Appropriate means for carrying my invention into effect is illustrated in the accompanying drawing, which is a vertical section of the carbonizing-chamber.

A is the chamber or crucible, preferably of plumbago.

a a are filaments of carbonizable material placed in the bottom of the crucible. Bars *b b* of carbon are placed above them to prevent them from rising in the liquid.

B is powdered lead filling the lower portion of the crucible.

C represents larger pieces of lead placed above the small particles.

The crucible has a cover D preferably luted upon it. On the crucible being exposed to heat in the carbonizing-furnace the lead melts and forms a column of liquid in the crucible above and around the filaments, so that the same are held under pressure, which as they are carbonized keeps them in shape and also consolidates their structure. The lead will not boil under the heat required for carbonization. The powdered lead prevents the larger pieces from injuring the filaments by contact before the lead is melted. The liquid material permits the contraction which occurs during carbonization. After the filaments are carbonized the cover is removed from the crucible and the lead is poured out. Any small amount of lead or dross which may adhere to the filaments may be removed by the application of suitable acid. Other fusible metals, as tin or zinc, may be employed. I sometimes place in the bottom of the crucible close to the filaments a small quantity of fusible alloy in powdered form, which melts quickly before the lead does, so that the filaments are at once surrounded by liquid before any change takes place in their structure.

What I claim is—

1. The herein-described improvement in the method of carbonizing filaments for electric lamps, consisting in placing the bare filaments in a chamber, together with a quantity of lead or other fusible material in its unfused condition and then exposing the same to carbonizing-heat.

2. The combination, with the carbonizing-chamber, of the filaments, the powdered metal placed around and above them, and the larger pieces of metal above the powdered metal, substantially as set forth.

This specification signed and witnessed this 26th day of October, 1886.

THOS. A. EDISON.

Witnesses:

WM. PELZER,

E. C. ROWLAND.