UNITED STATES PATENT OFFICE.

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

MANUFACTURE OF CARBON FILAMENTS FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 490,954, dated January 31, 1893.

Application filed November 6, 1886. Serial No. 218,182. (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 for Electric Lamps, (Case No. 686,) of which the following is a specification.

The object of my invention is to produce carbon filaments for the incandescent conductors of electric lamps which shall be of even density and homogeneous structure and. I accomplish this in the following way. I first cut or otherwise form the carbonizable material, which is preferably fibrous vegetable material such for instance as bamboo, into slips or filamentary pieces of the proper size, and of the shape desired for the finished filament. These filamentary slips or blanks are placed in a suitable carbonizing chamber or crucible and are there exposed to heat in a suitable furnace, at the same time being so held that they will maintain their shape, until they are partially carbonized. Before their structure is entirely reduced to carbon, the filaments are removed from the chamber and are then placed in a solution of carbonizable material such as, sugar, molasses, licorice, coal-tar &c., and are allowed to soak therein for several hours during which time the solution penetrates into the interstices of the partially carbonized material and fills the same. The filaments are then removed from the solution, the superfluous material which adheres to their surfaces is wiped or scraped off and the filaments are allowed to dry. After drying they are again placed in the carbonizing chamber, being held as before so as to maintain their shape, and may then be completely carbonized, the carbonizable material being converted into carbon at the same time, the result being a dense and homogeneous carbon structure through all parts of which when it is placed in use the current passes evenly. I may however only partially carbonize the filaments at this time and then re-soak and again carbonize them, and this may be repeated several times if desired, the last step being a complete carbonization. The carbonaceous solution is preferably of about the consistency of ordinary table sirup. It may be varied within considerable limits however and still efficiently accomplish the desired result.

What I claim is:—

1. The herein described improvement in the method of manufacturing carbon filaments for incandescent electric lamps, consisting in first forming filaments of carbonizable material, then partially carbonizing the same before they have been soaked or otherwise similarly treated, then soaking the same in a solution of a carbonizable substance and finally completely carbonizing the whole.

2. The improvement in the art of manufacturing filaments for incandescent electric lamps which consists in forming filaments of carbonizable material, maintaining them in the desired shape, and partially carbonizing the same before they have been soaked or otherwise similarly treated, then filling the pores of the filaments by soaking them in a liquid carbonizable material, and finally completely carbonizing the filaments, substantially as described.

This specification signed and witnessed this 2d day of November, 1886.

THOS. A. EDISON.

Witnesses:
WM. PELZER,
E. C. ROWLAND.