

(No Model.)

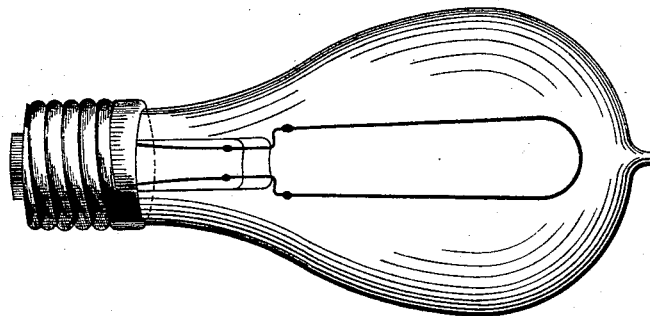
G. ERLWEIN.

FILAMENT FOR INCANDESCENT ELECTRIC LAMPS.

No. 455,187.

Patented June 30, 1891.

Carbon Filament with a Coating of Nitride of Boron.



Witnesses
M. B. Harris
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UNITED STATES PATENT OFFICE.

GEORGE ERLWEIN, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS & HALSKE,
OF SAME PLACE.

FILAMENT FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 455,187, dated June 30, 1891.

Application filed February 18, 1891. Serial No. 381,953. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ERLWEIN, doctor of philosophy, a subject of the German Emperor, residing at Berlin, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Filaments for Electric Glow-Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to filaments for incandescent lights; and it consists in providing filaments, preferably the ordinary carbon filaments, with a solid coating which does not melt at the temperature of the incandescent filament and protects the core of the filament against atomization or dispersion.

Nitrides of silicon and boron, which remain stable at the highest temperatures, prove specially suited for this purpose, and, furthermore, since an incandescent body provided with such a coating neither loses nitrogen nor absorbs oxygen it may be made to glow even in a room filled with air.

Since nitrides of silicon and boron are very similar in their preparation and use, I shall describe the use of boron compounds, considering like silicon compounds as equivalents.

Various processes for the production and deposit of these compounds are well known to chemists; but I prefer to soak the carbon filaments in easily-reducible compounds of boron free of oxygen and in double salts, preferably haloid ammonia double salts, also free of oxygen, and then to gradually heat the filament up to a red heat in the presence of volatile nitrogen compounds, preferably ammonia, free of oxygen.

The required heat is best obtained by passing the electric current through the carbon filament. The boron compounds in contact

with the filament are reduced by the heat and form with the nitrogen of the ammonia solid nitrides of boron, which are deposited nearly uniformly over the surface of the carbon filament, forming a refractory and efficient coating therefor.

The figure represents an electric glow-lamp, showing one form of filament which may be adopted in my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In incandescent electric lamps, a glow body consisting of a carbon filament for a core, and a coating of nitrides of boron incasing the core, substantially as described.

2. The process of preparing a filament for incandescent electric lamps by soaking the said filament in liquid boron compounds and in treating it at a higher temperature in a reducing atmosphere containing nitrogen, substantially as described.

3. The process of preparing a filament for incandescent electric lamps by soaking the said filament in liquid easily-reducible boron compounds and double salts free of oxygen, and in then gradually heating up to a red heat in an atmosphere of ammonia or other nitrogen compound free of oxygen, substantially as described.

4. The process of preparing a filament for incandescent electric lamps by soaking the said filament in boric chloride and in then gradually heating up to a red heat in an atmosphere of ammonia, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE ERLWEIN.

Witnesses:

WILHELM SCHULTZ,
MAX WAGNER.