# UNITED STATES PATENT OFFICE.

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## INCANDESCENT.

SPECIFICATION forming part of Letters Patent No. 334,142, dated January 12, 1886.

Application filed November 20, 1883. Serial No. 112,318. (No specimens.)

*To all whom it may concern:*

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Manufacture of Carbon Conductors, of which the following is a full, clear, and exact description.

In a patent granted to me September 26, 1882, No. 264,986, I have described carbon conductors for incandescent lamps, which are prepared in substantially the following manner: A given quantity of pure cellulose—such as cotton-waste, linen, or paper—is converted into pyroxyline, and this in turn, after being washed and dried, converted by the use of well-known solvents into collodion or celluloid, according to the solvent used. The compound thus produced, being a viscous fluid, is poured upon glass plates and allowed to spread out into sheets and dried. These sheets are then immersed in a bath of ammonium sulphide, protochloride of iron, or other chemically-equivalent reducing agent, and exposed to the action of the same until they are reconverted into cellulose so far as their chemical composition is concerned, but cellulose without fiber or definite structure. The reconverted material is then washed, dried, and cut up by any suitable means into strips or blanks, which are carbonized and used as incandescent conductors in electric lamps.

I have found that the conductors obtained from the material when treated in the manner described are often imperfect, the imperfections and variations in electrical resistance being due to irregularities in the sheets brought about by the uneven spreading of the material while in liquid form and uneven contraction and warping when drying. These objections I have in a great measure overcome by preparing sheets or films of greater thickness than that required, and reducing these sheets by rolls to a standard thickness, and then cutting out the blanks from them.

The best manner of carrying out this invention of which I am aware is by taking advantage of a certain degree of plasticity which I have found that the reverted or amorphous cellulose after being dried retains, and to roll or reduce the sheets after they have been brought to this condition.

This method in detail is as follows: I prepare the desired quantity of non-fibrous or amorphous cellulose by the process above described, but in sheets or films of greater thickness than that required for the blanks from which the carbons are made. These sheets or films are washed and placed between sheets of bibulous paper, where they are kept until all the moisture is absorbed, after which they are passed between rolls and reduced to the required thickness. The rolls for this purpose may be of the ordinary kind, care being taken to have their surfaces extremely smooth and to move them evenly and steadily. The material may be reduced to the desired thickness by one passage through the rolls, though it will generally be found advisable to pass the sheets through several pairs of reducing-rolls. The sheets when thus reduced present a smooth and even surface, and are of practically uniform thickness and density. From these sheets blanks of approximately the shape desired for the carbons are cut or stamped, preferably by ordinary dies. These blanks are then placed in a muffle and carbonized, after which they may be mounted in the globes of the lamps. When desirable or necessary, the blanks or the carbons may be subjected to other treatment for improving or modifying their character.

The thickness of the sheet required for producing carbons approximating to a standard resistance is readily determined by experiment.

While the most accurate results are attained by the treatment described, making it the most desirable on this account, it is also possible to roll the sheets of collodion or celluloid either with or without the admixture of other substances to the standard thickness, and then convert them into cellulose.

I am aware that various plastic substances employed in the manufacture of carbon conductors have been rolled out into sheets and cut up into blanks of the desired shape, and I do not claim broadly, therefore, this method of manufacture; but,

Having described my improvements, what I claim is—

The process of manufacturing carbon conductors for incandescent lamps from non-fibrous or amorphous cellulose, which consists in producing the cellulose in sheets or films of greater thickness than desired, and drying the same, then reducing the thickness of the sheets by passing them between rolls, then cutting or stamping the blanks for the conductors from the sheets and carbonizing the same, substantially as herein set forth.

In testimony whereof I have hereunto set my hand this 17th day of November, 1883.

EDWARD WESTON.

Witnesses:

HENRY A. BECKMEYER,

PARKER W. PAGE.