(No Model.)

E. WESTON.

INCANDESCENT LAMP.

No. 340,396. Patented Apr. 20, 1886.

Fig. 1.

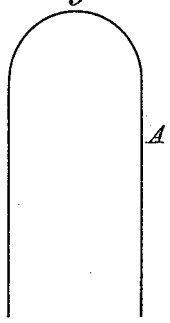


Fig. 2.

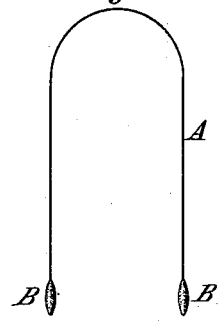


Fig. 3.

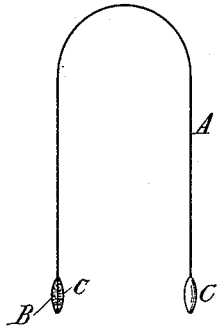


Fig. 4.

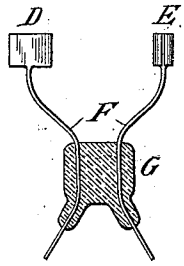
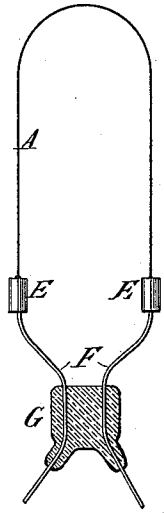


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 340,396, dated April 20, 1886.

Application filed August 26, 1885. Serial No. 175,350. (No model.)

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 Incandescent Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

In incandescent electric lamps as commonly made a slender strip or filament of carbon is united to metallic wires, which are sealed in the material of the receiver or globe in which the carbon is contained. Various expedients have been resorted to for effecting a good mechanical or electrical joint or union between the carbon and its supporting-wires. This is somewhat facilitated by forming the carbon with enlarged ends, or subsequently applying by electro-deposition masses of carbon upon the ends of the filament. The supporting-wires have been united to these ends by screws and nuts, by spring-clamps, by carbon paste, and by an electro-deposited joint; but the best forms of joint as yet devised have many objectionable features, which become apparent after the lamp has been in use for some time.

My object is to produce a better and more durable form of joint or means for uniting the carbon and metallic conductors, and this I accomplish in the following manner: I form the carbons from slender threads or strips cut out by a die or shearing-blade from any suitable material, whether fibrous or amorphous, though I prefer to use the substance called by me "tamidine." Upon the ends of these strips, after carbonization, I build up or deposit enlarged ends of carbon by the well-known process of electro-deposition—that is to say, by raising to incandescence such portions of the carbons only as I desire to enlarge in a hydrocarbon fluid or vapor. The electro-deposited ends or stubs I then immerse in an electrolytic solution—preferably a solution of nickel—and by means of a light current I deposit thereon a coating of hard metal. The conducting or supporting wires of platinum I flatten on the ends, and by a suitable tool I form them into a tube or socket. The electro-plated stubs are then inserted into these tubes or sockets, which are then slightly pinched when necessary to insure good contact.

It has been the practice heretofore to insert the ends or stubs of the carbons into metal sockets on the ends of the supporting-wires, and also to flatten and wrap around the stubs the ends of said wires. It is possible to obtain a good joint in this way when the stub of the carbon is formed in the blank before carbonization or is an integral part of the carbon filament itself; but when it is applied by electro-deposition or similar means, it is less easy to obtain a good joint, for by attempting to insert a tightly-fitting stub into a tube or socket, or to pinch the socket or flattened wire around the stub, the latter or the filament, or both, are very liable to be broken. The electro-deposited stubs are quite brittle, and the least pressure is apt to crack them. An electro-deposited metal or carbon film over and around a joint thus formed avoids the difficulty only in part, for while it prevents to a great extent the joint from loosening under wide changes of temperature, it is a process involving great care in its execution and several steps in the subsequent treatment of the carbon. By the process which I have invented, however, a smooth and even shell or casing of metal is formed upon the stub, which is capable of resisting considerable pressure, and which not only protects the stub, but maintains good electrical contact so long as any part of it touches the platinum tube or socket on the supporting-wires.

In the drawings hereto annexed, Figure 1 represents the carbon strips without the stubs. Fig. 2 shows the same with the stubs. Fig. 3 shows the electro-deposited metal shell on the stubs. Fig. 4 illustrates the manner of forming the wires. Fig. 5 is a view of a carbon attached to the supporting-wires.

A is the carbon; B the stubs formed or applied by the well-known process of electro-deposition described in my Patent No. 306,980, of October 21, 1884.

C is the metal coating or shell of nickel.

The supporting-wires F are flattened at the ends, as shown at D, Fig. 4, and then rolled or drawn into the tube or socket, as at E in the same figure. They are then sealed in a mass

of glass, as G. The carbons are then mounted by inserting the stubs into the tubes E, and, when the two do not fit tightly, pinching slightly the tube upon the stub.

I am aware that stubs or enlarged ends have been formed by electro-deposition and similar means upon carbon conductors; and I am also aware that the ends of carbons, whether enlarged or not, have been electroplated; but in all cases of which I am aware the enlarged end formed originally an integral part of the carbon, and the coating of metal has been applied solely for the purpose of obtaining good contact. My invention applies, however, only to electro-deposited stubs, and the purpose of the metal jacket or shell is not only to secure good contact, but to resist pressure and protect the carbon from being broken or injured. For this reason, as above explained, it must be thicker than the coat required only for contact, and should be of a hard metal that makes a perfect union with the carbon. For this reason I use nickel.

What I claim is—

1. A carbon conductor having electro-deposited stubs or ends of carbon incased in electro-deposited casings or shells of metal, in combination with supporting-wires formed with tubes or sockets at their ends, into which the stubs are inserted, as set forth.

2. A carbon conductor having electro-deposited stubs or ends of carbon incased in electro-deposited casings or shells of metal, in combination with supporting-wires of platinum flattened at their ends and rolled or drawn into tubes or sockets, into which the stubs are inserted, as set forth.

3. A carbon conductor having electro-deposited stubs or ends of carbon incased in electro-deposited casings or shells of nickel, in combination with supporting-wires of platinum formed with tubes or sockets on their ends, into which the stubs of the carbon are inserted, as set forth.

4. A carbon conductor having electro deposited stubs or ends incased in electro-deposited metallic casings or shells, as set forth.

5. The method or process of mounting the conductors of incandescent lamps, which consists in forming or building up on the ends of a carbon strip enlargements or stubs, re-enforcing said stubs with a casing or shell of an electro-deposited metal, such as nickel, and uniting said stubs to the supporting-wires, all substantially as herein set forth.

EDWARD WESTON.

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