

W. E. SAWYER & A. MAN.

ELECTRIC LIGHT.

No. 317,676.

Patented May 12, 1885.

Figure 2.

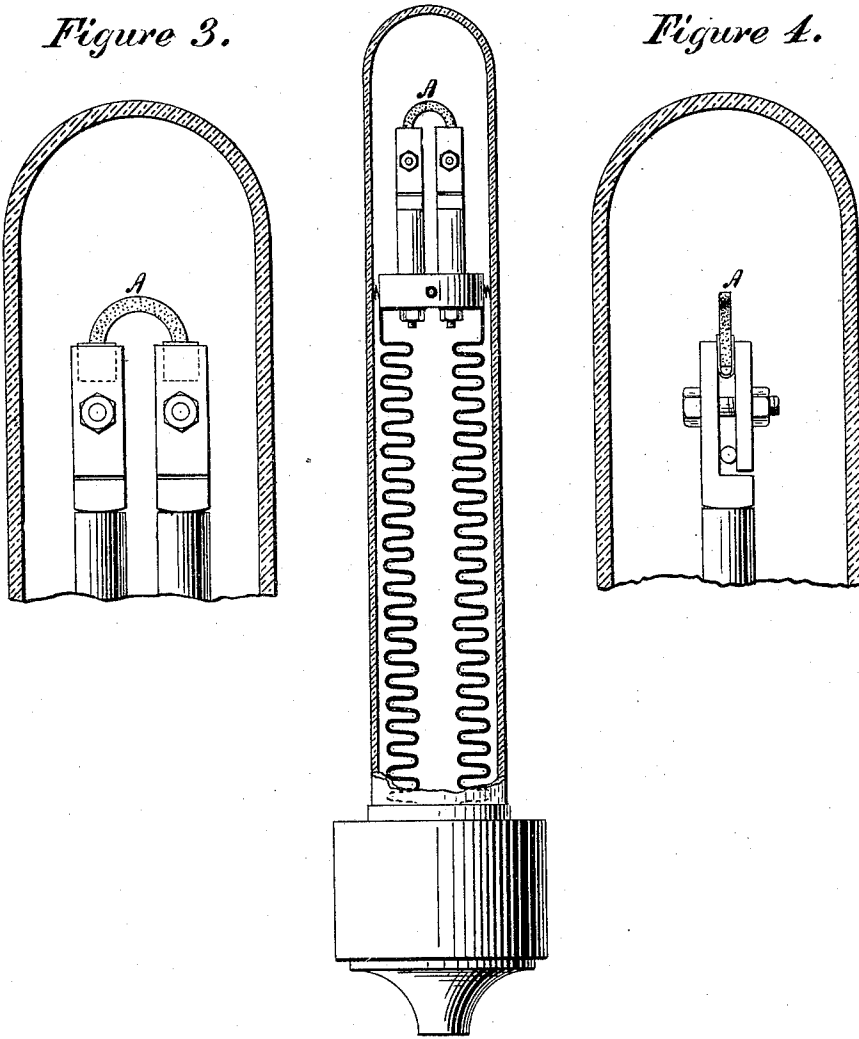


Figure 1.

Witnesses:

Geo. W. Miatt

Jas. G. Cooper.



Inventors:

W. E. Sawyer
Alban Man
by their atty
W. D. Baldwin

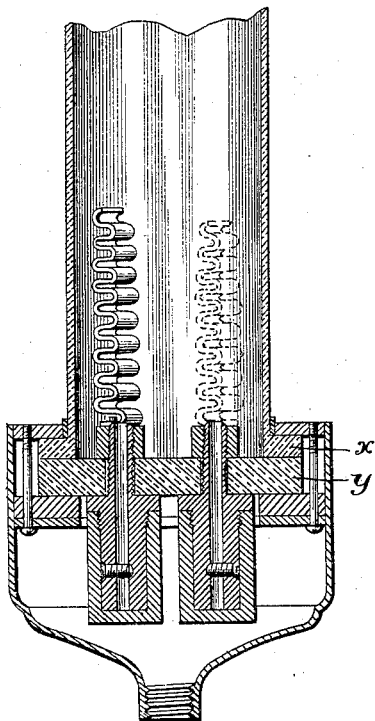
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Fig 5



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM EDWARD SAWYER, OF NEW YORK, AND ALBON MAN, OF BROOKLYN, N. Y., ASSIGNORS TO ELECTRO-DYNAMIC LIGHT COMPANY OF NEW YORK.

ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 317,676, dated May 12, 1885.

Application filed January 9, 1880.

To all whom it may concern:

Be it known that we, WILLIAM E. SAWYER, a resident of the city, county, and State of New York, and ALBON MAN, a resident of Brooklyn, in the county of Kings and State aforesaid, both citizens of the United States, Improvements in Electric Lamps, of which jointly have invented certain new and useful improvements the following is a specification.

Our invention, speaking generally, relates to that class of electric lamps employing an incandescent conductor inclosed in a transparent hermetically-sealed vessel or chamber, from which oxygen is excluded, and constitutes an improvement upon the apparatus shown in Letters Patent No. 205,144, granted to us June 18, 1878.

Our invention relates more especially to the incandescing conductor, its substance, its form, and its combination with the other elements composing the lamp. Its object is to secure a cheap and effective apparatus; and our improvement consists, first, of the combination, in a lamp-chamber composed wholly of glass, as described in Patent No. 205,144, of an incandescing conductor of carbon made from a vegetable fibrous material, in contradistinction to a similar conductor made from mineral or gas carbon, and also in the form of such conductor so made from such vegetable carbon, and combined in the lighting-circuit within the exhausted chamber of the lamp.

The accompanying drawings show all our improvements embodied in an apparatus or lamp substantially like that represented in the patent above referred to, being the form in which we have practically used it; but some of our improvements may be used in connection with other forms of lamps with equally good effect.

Reference being had to said drawings, Figure 1 is a top view of the lamp; Fig. 2, a side elevation thereof; Fig. 3, a side view in elevation of the burner on an enlarged scale to show its details more clearly, and Fig. 4 is a similar edge view.

Fig. 5 of the drawings shows a vertical section through the bottom of the lamp. In this figure *x* is a glass flange on the bottom of the lamp-chamber. *y* is a glass disk corresponding

in size to the flange, and is ground to the bottom thereof to form an air-tight joint, so that the entire wall of the chamber is formed of glass, the electrodes passing through the glass disk in the manner shown to form the lighting-circuit in the chamber, substantially as in said Patent No. 205,141. The sealing of the electrodes, where they pass through the glass wall, is done with any suitable cement, or in any of the well-known methods of sealing glass upon metal electrodes previous to the filing of this application.

The electric connections of this lamp are made in the base thereof, substantially the same as in our Patent No. 210,809, dated December 10, 1878, and the whole bottom is inclosed in a cup filled with wax or other suitable cement, the same as in that patent, the cement sealing in this lamp being also applied in substantially the same way as in the last above mentioned, the invention making the subject-matter of this application being improvements upon the lamps described in the patents above referred to, to the extent of the claims making part hereof.

In the practice of our invention we have made use of carbonized paper, and also wood carbon. We have also used such conductors or burners of various shapes, such as pieces with their lower ends secured to their respective supports and having their upper ends united so as to form an inverted V-shaped burner. We have also used conductors of varying contours—that is, with rectangular bends instead of curvilinear ones; but we prefer the arch shape.

No especial description of making the illuminating carbon conductors, described in this specification and making the subject-matter of this improvement, is thought necessary, as any of the ordinary methods of forming the material to be carbonized to the desired shape and size, and carbonizing it while confined in retorts in powdered carbon, substantially according to the methods in practice before the date of this improvement, may be adopted in the practice thereof by any one skilled in the arts appertaining to the making of carbons for electric lighting or for other use in the arts.

An important practical advantage which is

secured by the arch form of incandescing carbon is that it permits the carbon to expand and contract under the varying temperatures to which it is subjected when the electric current is turned on or off without altering the position of its fixed terminals. Thus the necessity for a special mechanical device to compensate for the expansion and contraction which has heretofore been necessary is entirely dispensed with, and thus the lamp is materially simplified in its construction. Another advantage of the arch form is that the shadow cast by such burners is less than that produced by other forms of burners when fitted with the necessary devices to support them.

Another important advantage resulting from our construction of the lamp results from the fact that the wall forming the chamber of the lamp through which the electrodes pass to the interior of the lamp is made wholly of glass, by which all danger of oxidation, leakage, or short-circuiting is avoided.

The advantages resulting from the manufacture of the carbon from vegetable fibrous or textile material instead of mineral or gas carbon are many. Among them may be mentioned the convenience afforded for cutting and making the conductor in the desired form and size, the purity and equality of the carbon obtained, its susceptibility to tempering, both as to hardness and resistance, and its toughness and durability. We have used such burners in closed or hermetically-sealed transparent chambers, in a vacuum, in nitrogen gas, and in hydrogen gas; but we have obtained the best results in a vacuum, or an attenuated atmosphere of nitrogen gas, the great desideratum being to exclude oxygen or other gases capable of combining with carbon at high temperatures from the incandescing-chamber, as is well understood.

The nature of our inventions and the operation of our improved lamp will be readily understood from the foregoing description and the following claims.

We claim as our joint invention—

1. An incandescing conductor for an electric lamp, of carbonized fibrous or textile material and of an arch or horseshoe shape, substantially as hereinbefore set forth.

2. The combination, substantially as hereinbefore set forth, of an electric circuit and an incandescing conductor of carbonized fibrous material, included in and forming part of said circuit, and a transparent hermetically-sealed chamber in which the conductor is inclosed.

3. The incandescing conductor for an electric lamp, formed of carbonized paper, substantially as described.

4. An incandescing electric lamp consisting of the following elements in combination: first, an illuminating-chamber made wholly of glass hermetically sealed, and out of which all carbon-consuming gas has been exhausted or driven; second, an electric-circuit conductor passing through the glass wall of said chamber and hermetically sealed therein, as described; third, an illuminating conductor in said circuit, and forming part thereof within said chamber, consisting of carbon made from a fibrous or textile material, having the form of an arch or loop, substantially as described, for the purpose specified.

In testimony whereof we have hereunto subscribed our names this 8th day of January, 1880.

WILLIAM EDWARD SAWYER.
ALBON MAN.

Witnesses:

WM. H. CHURCH,
WM. D. BALDWIN.