(No Model.)

T. A. EDISON.

ELECTRIC LAMP.

No. 248,419. Patented Oct. 18, 1881.

Fig. 1.

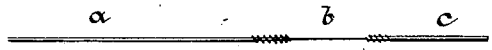


Fig. 2.

Fig. 3.

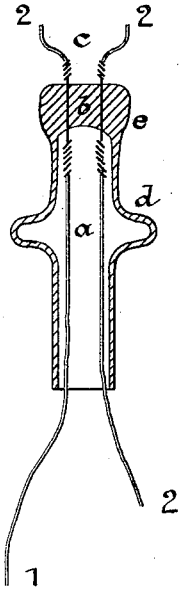
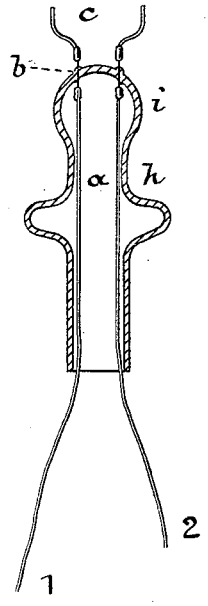


Fig. 4.



ATTEST

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ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 248,419, dated October 18, 1881.

Application filed April 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Electric Lamps; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In incandescent electric lamps the portion to be heated by the current to the light-producing degree, usually termed the "incandescing conductor," is affixed to conductors, one at each of its ends, termed now the "leading-in" conductors, which extend beyond and without the inclosing-globe of the lamp, and are adapted to be secured to and form electrical connection with the ordinary conductors leading from and to the source of electrical energy.

In lamps of the incandescent kind hitherto made, of which the United States Letters Patent Nos. 213,643 and 205,144 may be taken as types, these leading-in conductors were of copper. In such cases the envelope or globe of the lamp was required to be of two diverse materials—the main part of glass, with a metal or rubber portion covering or filling an aperture in the glass, for the reason that it has been found impossible, as a rule, to reliably seal copper leading-in conductors directly into the glass; hence they were secured to the metal or passed through the rubber.

To maintain a stable vacuum I have found that it is requisite that the envelope or globe be of the one material alone—glass. By proper changes in the conditions of the lamp I finally succeeded in producing a lamp wherein the leading-in conductors might be sealed directly into the glass, so that the envelope or globe could be entirely of the one material—glass. This was first disclosed in Letters Patent of the United States No. 223,898, granted me January 27, 1880. In such patent the leading-in wires or conductors are of platinum, the platinum extending inwardly to the incandescing conductor and outwardly sufficiently to form connection with the ordinary conductors. In that case a portion of platinum was sealed in the glass, another portion was secured to the incandescing conductor, and the two were afterward united. For use with the incandescing carbon as now made—namely, as a filament in the shape of an oval or horseshoe—this involved defects: First, the filament being subjected to two manipulations—the securing of a platinum piece to it and the securing of such platinum piece to that sealed in the glass—and being quite delicate, there was considerable liability to breakage; and, second, the use of platinum within the lamp involved considerable expense.

The object of the invention in this case is to remedy or obviate both these defects by such a construction of the leading-in conductors that a minimum of platinum shall be used therein, and so that the incandescing conductor shall be attached to the leading-in conductor sealed in the glass by one manipulation, thereby lessening the chances of breakage.

To accomplish this each leading-in conductor is made of three pieces—a central one, consisting of a bit of platinum as long as or a mere trifle longer than is to be the length of the contact of the inclosing-glass with the leading-in conductor; an inner terminal, which is to rise from the platinum bit within the globe to the height at which it is desired to support the carbon; and an outer terminal, which may be of any desired or convenient length, the terminal being of copper or any suitable low-resistance conductor, and fastened to the central platinum by soldering or in any other efficient method. This is illustrated in the drawings, in which—

Figures 1 and 2 show such a leading-in conductor, and Figs. 3 and 4 supporting-necks, each with two such conductors properly sealed in.

A piece of platinum, *b*, is taken, and to it are secured copper terminals *a c*.

Hitherto I have shown two ways of sealing in the wires, one represented in Fig. 3, wherein the wires are laid in the tube which is to form the support for the carbon and globe, the glass heated and pressed together, as at *e*. In the other case, in Fig. 4, a small bulb, *i*, is blown, and the wires passed through the top and the glass sealed therearound.

In Fig. 3 the wires are in contact with the

glass for a greater distance than in Fig. 4. The length of the platinum *b* should be proportioned to this length of contact, being just about equal or slightly greater in length than the contact. For instance, in Fig. 1 the platinum *b* is slightly larger than the length of the sealing portion *e* of Fig. 3, while in Fig. 2 it is much shorter, but bears the same relation to the sealing length as in the other case.

Of the copper wires, *c* is the inner terminal, and receives upon its free end the carbon, which is fastened thereto either by clamps, by plating, or by wiring. *a* is the outer terminal, and may be of any desired length.

The leading-in conductors thus made are sealed into the glass of the lamp, as shown in Figs. 3 and 4, the carbons being then attached to the inner or free ends, so that the carbons are subjected to only one operation in their proper placement upon the leading-in conductors.

By this construction the advantages of platinum as a leading-in conductor are preserved, while a minimum of the expensive material is used.

What I claim is—

1. The leading-in conductor for an incandescent electric lamp, consisting of a central platinum piece for sealing into the glass envelope of a lamp, and terminals attached thereto, of cheaper metal, the one for union with the incandescing conductor, the other for connection to the exterior conductors, substantially as and for the purposes set forth.

2. In an electric lamp, the combination of a piece of platinum sealed into the glass, and terminals of other metals affixed thereto, one extending into the lamp for union with the incandescing conductor, the other protruding therefrom for connection to the ordinary conductors, substantially as and for the purposes set forth.

This specification signed and witnessed this 30th day of March, 1881.

THOS. A. EDISON.

Witnesses:
BERNARD J. KELLY,
H. W. SEELY.