(No Model.)

# T. A. EDISON.

## INCANDESCENT ELECTRIC LAMP.

No. 264,654. Patented Sept. 19, 1882.

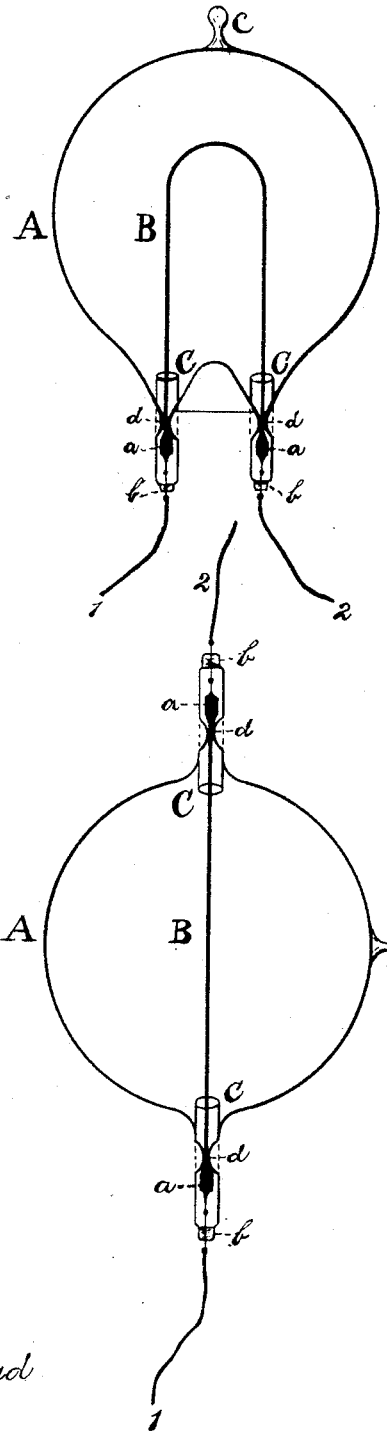


Fig 1.

Fig 2

WITNESSES:

Edward C. Rowland

H. W. Seely

INVENTOR:

T. A. Edison

BY Rich'd N. Dyer.

ATTORNEY.

# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

## INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 264,654, dated September 19, 1882.

Application filed August 7, 1882. (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 Incandescent Electric Lamps, (Case No. 396;) 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 the use of incandescent electric lamps in which the carbon incandescing conductor is attached to metal wires sealed in the glass of the inclosing-globe and extending up into the interior of such globe difficulty has sometimes been experienced from the exudation of the occluded air or other gases from the said metal wires and the clamps connecting them with the carbon, which may ensue upon the application of heat to the latter. Such occluded gases are removed from the carbon by heating it electrically during the process of exhausting the globe; but this heating is usually insufficient to completely eliminate them from the metal, and a portion of them therefore remain within the pores of the metal until driven forth by the heat occasioned by the passage of the electric current through the lamp. The vacuum thus becomes gradually impaired.

The object of my invention is to construct a lamp in which this difficulty shall not occur; and to this end my invention consists in a lamp having within its vacuum-chamber nothing but the carbon filament, the metal conductor and clamps being entirely outside. To accomplish this the ends of the carbon are first attached to the conducting-wires, (preferably by electroplating,) and a glass tube open at both ends is placed over each of the wires and pushed up so far as to include the point of union between the wire and end of the carbon within it. The lower end of the tube is then softened and pinched down upon the wires. The tubes holding the wires and carbons are then inserted into the glass inclosing-globe and hermetically sealed to the glass thereof by fusion. The air is then exhausted from the globe, the carbon filament being raised to high incandescence during the earlier part of this operation, and the globe is then sealed off at the exhausting-point, after which the glass of the tubes above mentioned is softened by heating at points above the junction of the carbon and wires and pinched down upon the carbon at such points. Thus the wires and all metallic portions of the lamp are excluded from the vacuum-chamber, which contains nothing but carbon. This may be better understood by reference to the annexed drawings, in which—

Figure 1 is a view of my lamp containing my ordinary U-shaped carbon, and Fig. 2 a view of a lamp in which a straight carbon filament is used.

A is the inclosing-globe, and B the carbon filament.

C C are the glass tubes, holding the ends of the wires 1 2 and of the carbon B, which are joined together at the points *a a* by electroplating. The wires 1 2 are sealed in the outer ends, *b b*, of the tubes, which are themselves fused to the glass of the globe A. The globe is exhausted at the point *c*, and the tubes are pressed down upon the carbon at points *d d*.

The wires 1 2 should be of platinum at the points where they pass through the glass.

What I claim is—

1. The exhausted inclosing-globe of an electric lamp, sealed directly upon the carbon incandescing conductor thereof, whereby all metal portions of the lamp are excluded from said globe, substantially as set forth.

2. The combination, with the exhausted glass globe of an electric lamp, of glass tubes projecting within and hermetically sealed to such globe, and having hermetically sealed within them the point of union of the incandescing conductor and the wires leading thereto, substantially as set forth.

3. The method of securing a stable vacuum in incandescing electric lamps, consisting in first exhausting the lamp and driving the occluded gases from the incandescing conductor by heating the same to high incandescence and then sealing the glass directly upon such incandescing conductor, substantially as described.

This specification signed and witnessed this 10th day of February, 1882.

THOMAS A. EDISON.

Witnesses:
H. W. SEELY,
WM. H. MEADOWCROFT.