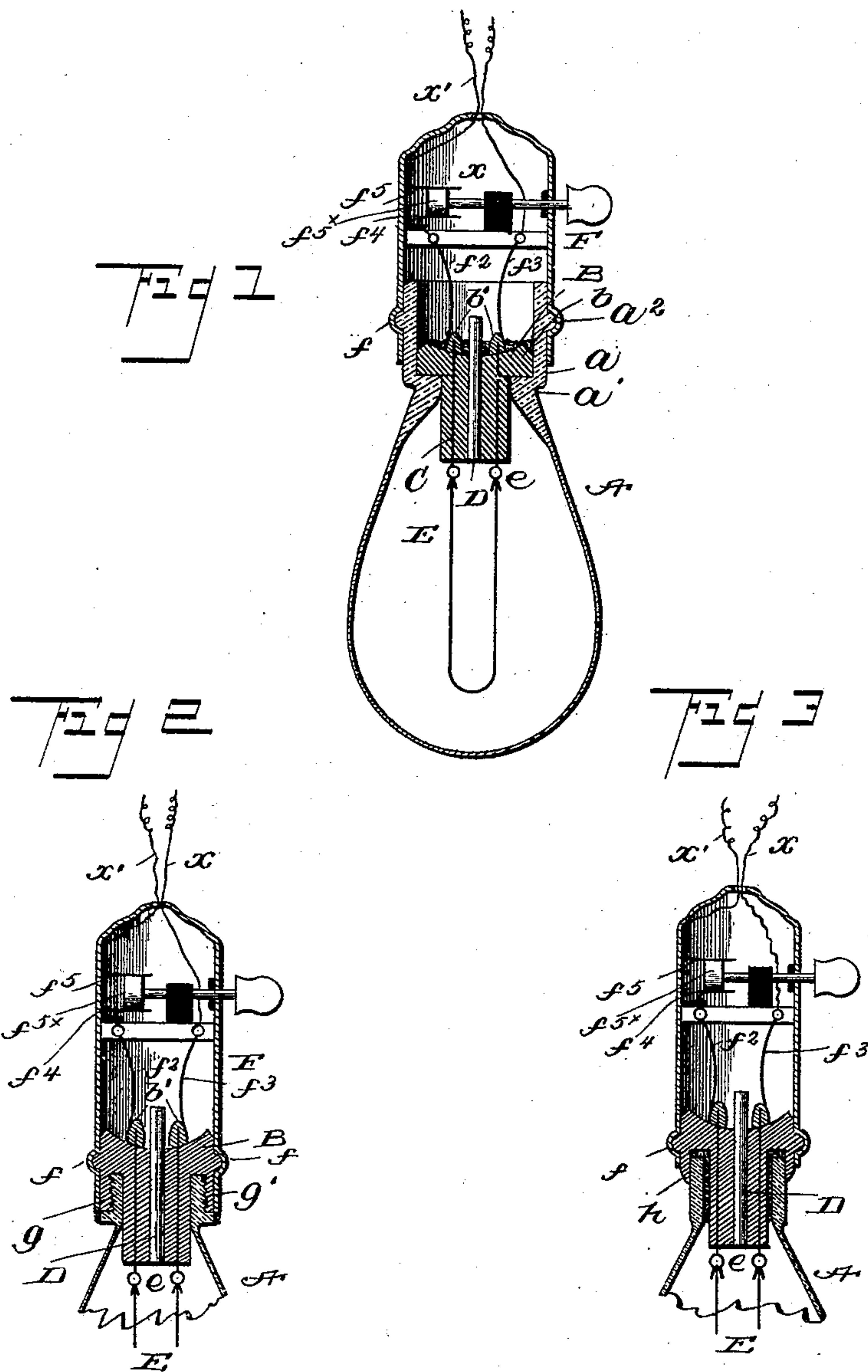


(No Model.)

E. W. APPLGATE.  
INCANDESCENT LAMP.

No. 488,139.

Patented Dec. 13, 1892.



Witnesses

*John J. Jamie*  
*W. S. Hodges*

Inventor

*Eugene W. Applgate*  
By his Attorney  
*John W. Westburn*



# UNITED STATES PATENT OFFICE.

EUGENE W. APPLGATE, OF OMAHA, NEBRASKA, ASSIGNOR TO THE APPLE-  
GATE ELECTRIC LIGHT AND POWER COMPANY, OF CHICAGO, ILLINOIS.

## INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 488,139, dated December 13, 1892.

Application filed April 7, 1892. Serial No. 428,139. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE W. APPLGATE, of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and  
5 useful Improvements in Incandescent Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and  
10 use the same.

This invention contemplates certain new and highly-useful improvements in incandescent lamps, and has for its object, primarily, the production of an improved lamp of this  
15 character capable of having its filaments readily and easily replaced when necessary, and to provide cheap and highly-efficient leading-in wires.

A further object is to provide an improved  
20 incandescent lamp from which the air can be exhausted at the neck of the bulb thereof.

A further object is to provide an incandescent lamp with an improved support for the leading-in wires, which support is hermeti-  
25 cally sealed and which can be removed when the filaments are to be replaced.

This invention comprises an incandescent lamp having the peculiar novel construction, combination, and arrangement of parts, sub-  
30 stantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view of an incandescent lamp constructed in accordance with my in-  
35 vention, the socket and bulb being shown disconnected. Figs. 2 and 3 are vertical sectional views showing slightly-modified connections between the lamp-neck and the cap or plug for the leading-in wires.

Referring to the drawings, A designates a glass bulb provided at its upper end with a cylindrical neck  $\alpha$ , at the lower end of the inner portion of which is formed a peripheral flange or shoulder  $\alpha'$ , the glass being thick-  
40 ened at these points. On the outer surface of the neck  $\alpha$  is a bead  $\alpha^2$ .

B is a cap or plug of cylindrical form, having an upper thickened end or head  $b$ , designed to fit snug upon the peripheral flange or shoul-  
50 der  $\alpha'$  and be supported thereby. This cap or plug is made of lava and is thoroughly

treated and compressed, so as to possess great density. Through this cap or plug B are passed the leading-in wires C, made of alu-  
minium, which material I have found equally  
55 as good for the purpose as platinum and far less expensive. The upper ends of these leading-in wires are held by suitable electrodes  $b'$ , attached to the upper concaved face of the head of plug B, while the lower inner ends  
60 of said wires are surrounded with asbestos cement.

D is a vertical tube extended through a central opening in the cap or plug B, its lower inner ends being coincident with the inner face  
65 of said cap or plug and its outer end projected beyond the head thereof. Through the agency of this tube air can be exhausted from the interior of the bulb. The upper end of said tube is sealed to the glass tube of a vacuum-  
70 pump, (not shown,) and after the air is extracted from the bulb the end of said tube D is sealed. The upper concaved face of the head of cap or plug B is covered with glass to seal all openings, and around the beveled  
75 edge of said head is placed soft glass that will fuse at not more than  $1,000^\circ$  of heat, thus practically making all one piece when sealed and permitting of the removal of said cap or plug  
80 when necessary.

The carbon filament E has its ends connected by suitable clamps—such as shown at  $e$ —to the inner ends of the leading-in wires.

F designates the socket, which I have found it advantageous to make of papier-maché.  
85 This socket is of cylindrical form and is provided with a lower spring-collar  $f$ , extending beyond its lower edge and designed to engage the bead  $\alpha^2$  on the neck of the lamp. From a cross-piece or partition  $f'$  in this socket ex-  
90 tend spring-arms  $f^2 f^3$ , the latter being connected with one of the circuit-wires  $\alpha$ , passed in through the top of the socket. The spring-arm  $f^2$  is in connection with a spring  $f^4$ , with which and a similar spring  $f^5$ , connected with  
95 circuit-wire  $\alpha'$ , is designed to engage the oval end of a key  $f^5$ , by means of which the circuit can be completed. The lower ends of the spring-arms  $f^2$  are in contact with elec-  
100 trodes  $b'$  when the socket is properly posi-  
tioned.

While the preferred form of supporting the



cap or plug is as above described, yet I do not limit myself thereto, since other forms of connection between such cap or plug and the neck of the bulb may be employed without  
5 departing from the spirit of my invention.

In Fig. 2 the bulb is shown as provided with an outer peripheral flange *g* at the base of its neck, which latter is exteriorly screw-threaded. The cap or plug B is provided  
10 with an outer depending flange *g''*, having on its inner surface a screw-thread engaging that of the neck and resting at its lower end upon flange *g*. Suitable soft glass or asbestos cement is placed around this flange to prevent  
15 the entrance of air between the latter and the cap or plug.

A second modification is shown in Fig. 3, wherein the lava cap or plug is shown as having its lower flange *h* resting upon and partially in-  
20 closing the upper end of the neck of the lamp-bulb. Asbestos or other suitable packing *h'* is placed between the cylindrical portion of the cap or plug and the neck of the lamp and soft glass or cement is placed between the de-  
25 pending portion of the flange *h* and said neck to further seal the same.

The advantages of my invention are apparent to those skilled in the art to which it ap-  
30 pertains, and it will be specially observed that there is a great saving in the cost of these lamps by being able to replace the worn or utilized carbon filaments, and the usefulness or serv-  
35 iceability of the lamp is materially enhanced; also, that by making the cap or plug of lava an inexpensive and highly-durable article is obtained, and said cap or plug is supported  
40 by and removably secured to the neck of the bulb and held by adhesives, which render the sealing hermetic. In the employment of lead-  
45 ing-in wires of aluminium there is still further saving in the cost of manufacture, and wires of this material are equally as effica-  
cious as those made of platinum now in gen-  
eral use.

Another highly-important advantage lies in the ability to exhaust the air from the lamp through the tube in the neck of the bulb.

I claim as my invention—

1. The herein-described improved incan-  
50 descent lamp, comprising the bulb, the cap or plug having a lower cylindrical portion and an upper widened end supported by the neck of said bulb and hermetically connected thereto, the leading-in wires formed of alu-

minium, extended through said cylindrical 55 portion of said cap or plug, and the vertical air-exhaust tube or opening leading centrally through said cylindrical portion of the cap or plug, substantially as set forth.

2. The herein-described improved incan- 60 descent lamp, comprising the bulb, the lava cap or plug having a cylindrical portion and upper widened end supported by said bulb, the leading-in wires of aluminium, extended through said cap or plug, the carbon filament 65 connected at its ends to said leading-in wires, the vertical exhaust-tube leading centrally through said cylindrical portion of said cap or plug, the socket removably secured to said cap or plug and having circuit-wires extend- 70 ing therein, and the connection between the latter and said leading-in wires, substantially as set forth.

3. The herein-described improved incan- 75 descent lamp, comprising the bulb provided at its neck with an inner peripheral flange, a cap or plug having a head at its upper end resting on said flange, the leading-in wires extended through said cap or plug, the carbon filament connected at its ends to 80 said leading-in wires, the electrodes over the upper ends of said leading-in wires, the removable socket having the circuit-wires extending thereinto, the plates designed to en- 85 gage said electrodes, and the key, substan- tially as set forth.

4. The herein-described improved incan- 90 descent lamp, comprising the bulb provided at its neck with a peripheral flange, a cap or plug of lava, having a head resting on said flange, 95 the air-exhaust tube extending through said cap or plug, the leading-in wires having electrodes over their upper ends, a covering around said electrodes, the removable socket of papier-maché having a cross-bar therein, 95 the spring-plates extending from said cross-bar to said electrodes, the circuit-wires one of which is connected directly to one of said spring-plates, and the key designed to form connection between the other circuit-wire and 100 spring-plate, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscrib- ing witnesses.

EUGENE W. APPLGATE.

Witnesses:

WILLIAM J. LLOYD,

EDWARD M. MULFORD, Jr.