

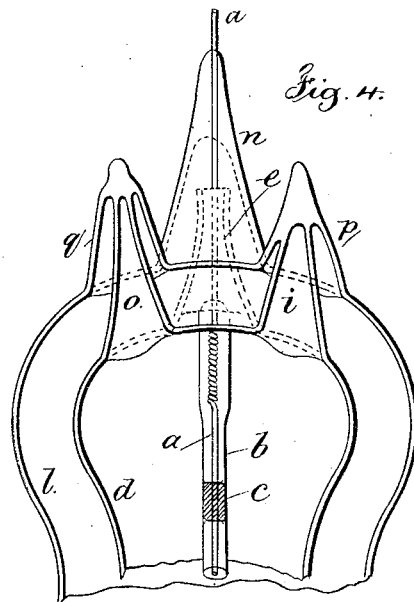
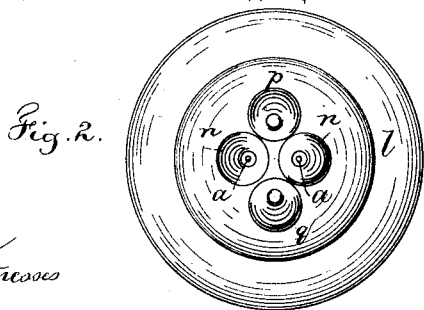
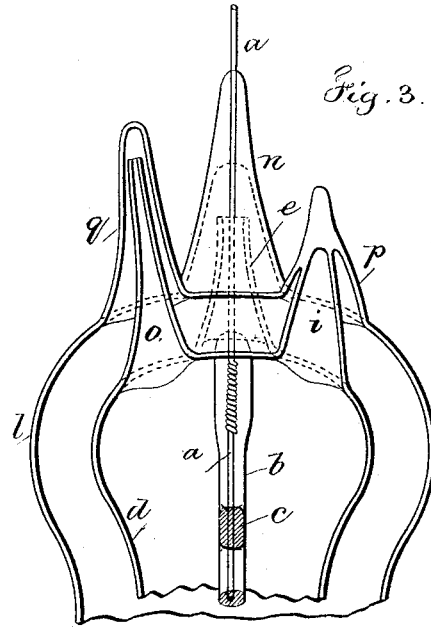
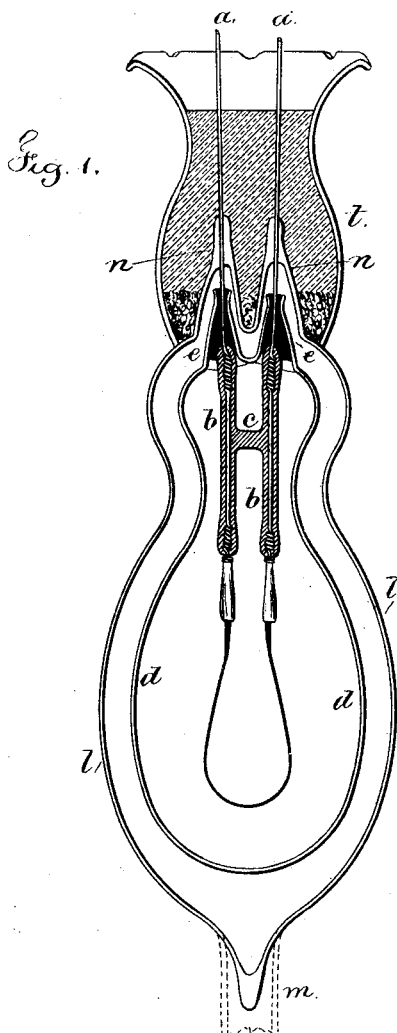
(No Model.)

J. H. GUEST.

ELECTRIC INCANDESCENT LAMP.

No. 258,747.

Patented May 30, 1882.



Witnesses

Chas. H. Smith
J. Fraib

Inventor

John H. Guest
Per Lemuel W. Ferrrell

UNITED STATES PATENT OFFICE.

JOHN H. GUEST, OF BROOKLYN, NEW YORK.

ELECTRIC INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 258,747, dated May 30, 1882.

Application filed December 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. GUEST, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Electric Incandescent Lamps, of which the following is a specification.

I have heretofore employed one globe inside another, and also a filling of lead between the glass nipple and the conducting-wires, as set forth in applications for patents heretofore made by me.

The object of the present invention is, first, to connect the inner globe to the outer one in such a firm and reliable manner that there is no risk of the inner globe being displaced or the connection of the two injured under the ordinary circumstances of handling; second, to support the conductors within the globe in such a firm manner that there will not be any strain upon the carbon while being secured to the conductors or when being introduced into the globe, and risk of injury to the carbon by concussion in transportation or handling is avoided; third, to more perfectly remove all traces of atmospheric air from the lamp-globes and to make a more perfect and reliable vacuum than heretofore in the globe containing the carbon filament, and in cases where the outer globe is broken the lamp may still be available, because the vacuum is maintained in the inner globe.

In the drawings, Figure 1 is a section of a lamp containing my improvements. Fig. 2 is a plan of the same without the cap. Fig. 3 is a partial section, in larger size, of the escape-opening from the inner globe; and Fig. 4 is a similar section with such opening hermetically closed.

The conductors are composed of the wires *a a*, which will usually be of copper, except at the ends that project outside the outer globe, where they terminate preferably with platinum. These wires forming each conductor are carefully twisted together, as shown, and covered with glass at *b b*, and there is a glass bridge, *c*, that connects the glass cases *b* of the wires and keeps them at the proper distance apart and in their correct relative positions. The carbon filament is connected with the ends of the respective metal conductors. This is usually done by carbonaceous materials, and when a

deposit of metal is made upon the bases of the carbon the glass cases for the conductors and the bridge facilitate the handling of the conductors and the carbon during the plating operation.

The globe *d* is of any desired shape, preferably of the elongated form shown. There are three or four hollow glass nipples, *e e i o*, made at the base of the globe *d*. The conductors *a a* are passed through the nipples *e e*, and retained therein by lead or similar metal drawn into the nipple in a melted state and caused to adhere to the glass and to the metal wires, so as to form a perfectly-tight joint, and one that will not be liable to crack when in use, because the metal in contact with the glass will not become heated at any time by the passing electric current.

The outer globe, *l*, is of a shape corresponding generally with the inner globe, but larger, and it is provided with three or four hollow teats, *n n, p*, and *q*, at its base, corresponding in position with the teats *e e i o*, but rather larger. When the inner globe is placed in the outer globe the wires *a a* are passed through the teats *n n* and secured by the glass being melted around the said wires, so as to be perfectly air-tight; or the wires may be secured in the outer globe-teats by lead, as aforesaid. The teat *i* passes into the teat *p*, and the two are melted together for the twofold purpose of hermetically sealing both globes at the point and also of forming a firm connecting leg or support for the globe *d* inside the globe *l*. The teat *o* passes into the teat *q*. The end of the latter is hermetically sealed, as shown in Fig. 3; but the end of the teat *o* is left open. The outer globe is properly shaped to inclose the globe *l*, and there is a tube at *m*, (see dotted lines, Fig. 1,) by which the apparatus is connected with any suitable air-pump or exhausting apparatus.

In removing the air I exhaust the glass globe, the air passing out of the inner globe through the teat *o* into the outer globe. When a good vacuum is obtained I admit hydrocarbon gas until atmospheric pressure, or nearly so, is obtained. Then I exhaust the said gas and obtain a good vacuum. Hydrocarbon gas is again admitted and partially exhausted, and the electric current is now passed through the carbon

filament and the same gradually raised to the desired incandescence, and a good vacuum obtained during the operation. Then the tube to the pump is hermetically sealed by melting the glass. As it is no longer necessary to maintain an opening in the inner globe, the teat *o* is hermetically sealed, and at the same time connected with the teat *q* by melting the two together, as seen in Fig. 4, which at the same time forms a strong connection for maintaining the inner globe in its proper position to the outer globe.

The outer globe may be ornamented by figures or designs engraved or etched upon its surface.

The cap or base piece *t* is preferably of glass, and it is of a size sufficient to receive within it the teats.

The parts are to be united by plaster or any suitable substance poured into the cap around the nipples, after the introduction of a narrow packing of cotton or similar material between the cap and the nipples.

The lamps may be placed so as to stand above the cap or base piece *t*; or they may be placed, as shown, so as to hang down below the base or point of support.

If desired, the lamps may be exhausted with the base uppermost. In this instance it is preferable to melt off the tube to the air-pump. Then turn the lamp with the base downward, apply the current to the carbon to heat any remaining air or gas, and cause it to pass down and out of the open teat *o* into the outer globe, *l*, and then the inner globe is sealed, as before described.

I am aware that two glasses have been applied around an electric lamp, such glasses being attached at their edges to the separate base-pieces. I do not claim an internal glass or globe and an external glass or globe combined with an incandescing filament and leading-in wires passing into such globes and sealed, whether such globes are exhausted or whether they are not. By my improvement I am able to make each glass globe

wholly of glass, without any base-piece, and of nearly uniform thickness throughout, and to connect the glass of the inner and of the outer globes permanently together.

I claim as my invention—

1. The metal conductors for an electric lamp cased with glass inside the globe and united by the glass cross-bar, substantially as set forth.

2. The combination, in an electric lamp, of the globe, the metal conductors, the glass cases covering such conductors, the carbon filament, and the lead or similar metal surrounding the conductors and within the glass teats of the globe, substantially as set forth.

3. In an electric lamp, the combination, with the inner and the outer glass globes, of teats through which the metallic conductors pass, and one or more projections or teats on the inner globe projecting into glass teats on the outer globe, and the glass melted together for supporting the inner globe in its proper position to the outer globe, as set forth.

4. The method herein specified of exhausting and hermetically sealing the inner globe of an electric lamp, consisting in providing an open teat on the inner globe, passing into a closed teat on the outer globe, exhausting both globes, and then hermetically sealing the parts by melting the glass of the outer and inner teats together, substantially as set forth.

5. In an electric lamp, two globes made wholly of glass, and each globe being of nearly-uniform thickness throughout, and the glass of the globes contracted around the conductors, and the two globes exhausted of air and each hermetically sealed, in combination with the conductors passing through the globes, and the incandescing filament within the inner globe, substantially as set forth.

Signed by me this 22d day of December, A. D. 1881.

J. H. GUEST.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.