

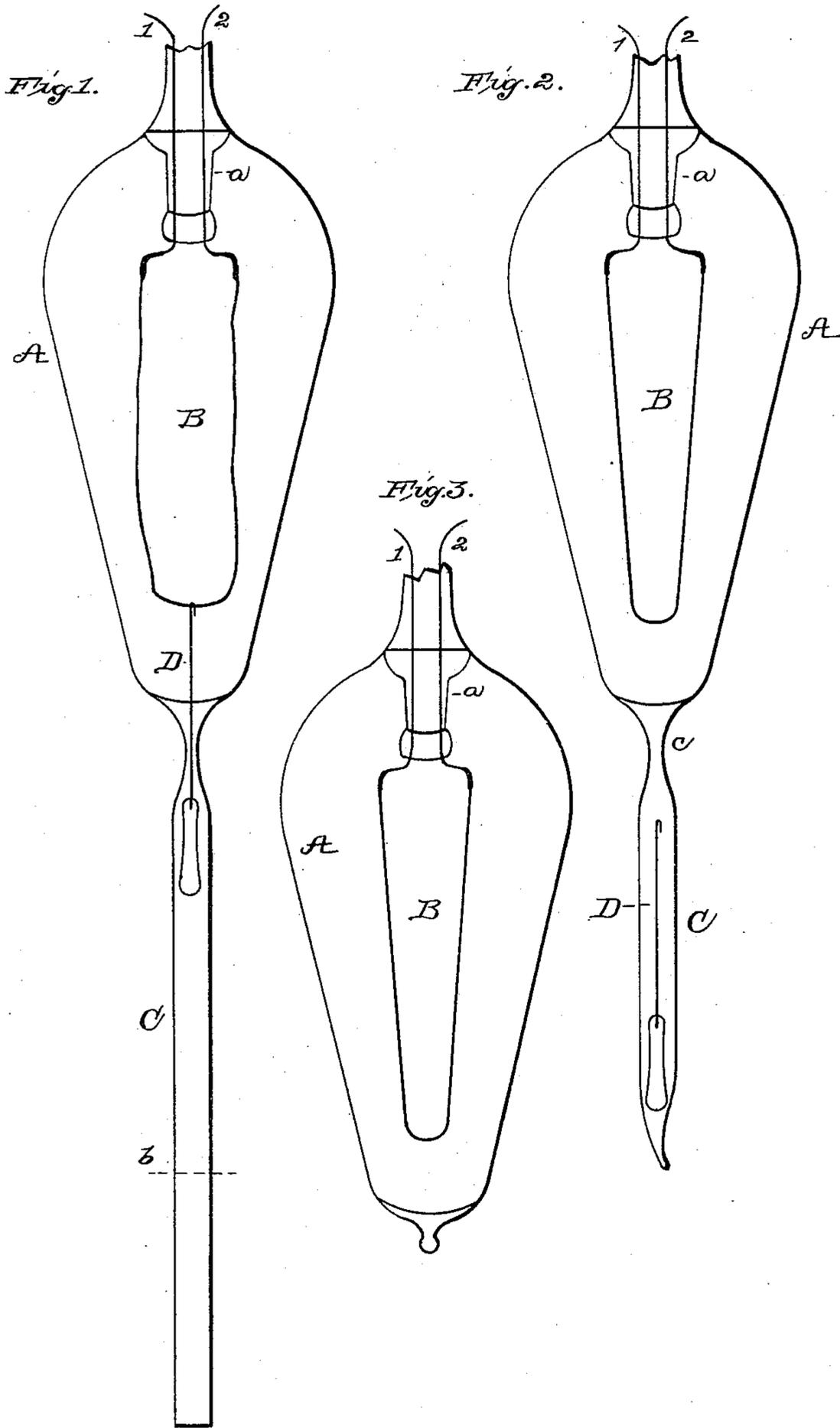
(No Model.)

W. HOLZER.

METHOD OF MANUFACTURING INCANDESCENT ELECTRIC LAMPS.

No. 323,150.

Patented July 28, 1885.



ATTEST:

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# UNITED STATES PATENT OFFICE.

WILLIAM HOLZER, OF HARRISON, NEW JERSEY.

METHOD OF MANUFACTURING INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 323,150, dated July 28, 1885.

Application filed June 5, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HOLZER, of Harrison, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in the Method of Manufacturing Incandescing Electric Lamps, of which the following is a specification.

The flexible carbon conductors or loops of incandescing electric lamps frequently become bent and irregular in shape during the process of carbonization, and sometimes, when raised to high incandescence, during the operation of exhausting the globes. This difficulty increases as the loops are increased in length and decreased in cross-sectional area, and forms a serious obstacle in the way of making high-resistance loops of regular and uniform shape. The object I have in view is to overcome this difficulty, which I do by subjecting the loops to strain while raised to incandescence in a vacuum. This I do while the lamps are being exhausted. A weight is attached to the end of each loop and keeps it under constant strain. When the loop is raised to a high incandescence, as it is at the end of the process of exhaustion, the carbon becomes somewhat plastic and the weight draws the loop into regular shape or prevents it from assuming an irregular form. This weight may be a wire with a hook end, and, if not heavy enough itself, may have any suitable body attached to it to increase its weight. The wire is passed into the exhaust-tube of the lamp and hooked onto the loop hanging down into such exhaust-tube. The exhaust-tube is made of sufficient length, so that when the lamp is ready for sealing off from the pump a seal can be made in the tube which will leave a tube attached to the lamp as long as the weight. By manipulation the weight is then unhooked from the loop and drops into the tube, when the lamp is sealed off from the tube carrying the weight. The weight can then be removed from the tube and used with other lamps.

The weight may be just sufficient to straighten the loop or prevent it from bending without materially changing its form, or it may be heavy enough to change the shape of the loop by drawing it into a wedge form.

This process may be applied to lamps in the course of construction, or lamps already con-

structed and having irregular loops may be opened and have exhaust-tubes attached to them, and then be re-exhausted and have their loops straightened by this process.

In the accompanying drawings, forming a part hereof, Figure 1 is an elevation of a lamp with exhaust-tube attached as it appears before exhaustion, the weight hanging on the loop; Fig. 2, an elevation of the lamp after the first sealing, the weight being detached from loop, and Fig. 3 an elevation of the lamp after final sealing.

Like letters denote corresponding parts in all three figures.

A is a lamp-bulb sealed to stem *a*, and inclosing a carbon-loop, B, secured to leading-in wires 1 2, passing through and sealed into the glass, as usual. The bulb has attached to it an exhaust-tube, C, into which is passed the wire-weight D with a hook end for hanging the weight on the loop, as shown in Fig. 1. A wire of copper or platinum has been found suitable. A piece of glass is shown as fused to the end of the wire to increase its weight.

The weight is hooked onto the loop by inserting a suitable tool in tube C, and the lamp is then put on the pump in the position shown in Fig. 1, the weight hanging downwardly.

After the operation of exhaustion is completed, which includes the heating of the loop to high incandescence by an electric current, the tube C is sealed off at the point indicated by the dotted line *b* in Fig. 1, producing the construction shown in Fig. 2. By manipulating the lamp the wire is unhooked from the loop and dropped into the closed tube C, when this tube carrying the weight is sealed off from the lamp at the point *e*, and the lamp is given its final sealing, producing the construction shown in Fig. 3. The lamp is then provided with circuit-terminals in any suitable way, and is ready for use.

The design of the lamp-bulb and carbon shown in Fig. 3 is covered by an application of even date herewith.

What I claim is--

1. The method of straightening a loop-form incandescing conductor or of changing its shape, consisting in subjecting it to strain while raised to incandescence, substantially as set forth.

2. The method of maintaining straight a loop-form incandescing conductor during the operation of exhausting the lamp and heating the conductor prior to sealing, consisting in  
5 maintaining such conductor under constant strain during such operation, substantially as set forth.

3. The method of exhausting and sealing incandescing electric lamps having loop-form  
10 conductors, consisting in attaching weights to the loops, then exhausting such lamps and heating the conductors therein, then sealing

off the tubes some distance from the lamps, then removing the weights from the conductors and dropping them into said tubes, and  
15 finally sealing off the lamps from the tubes above the weights, substantially as set forth.

This specification signed and witnessed this 1st day of May, 1884.

WILLIAM HOLZER.

Witnesses:

ALF. W. KIDDLE,  
E. C. ROWLAND.