

(No Model.)

J. A. VANDEGRIFT.

INCANDESCENT LAMP MANUFACTURE.

No. 397,479.

Patented Feb. 5, 1889.

Fig. 1

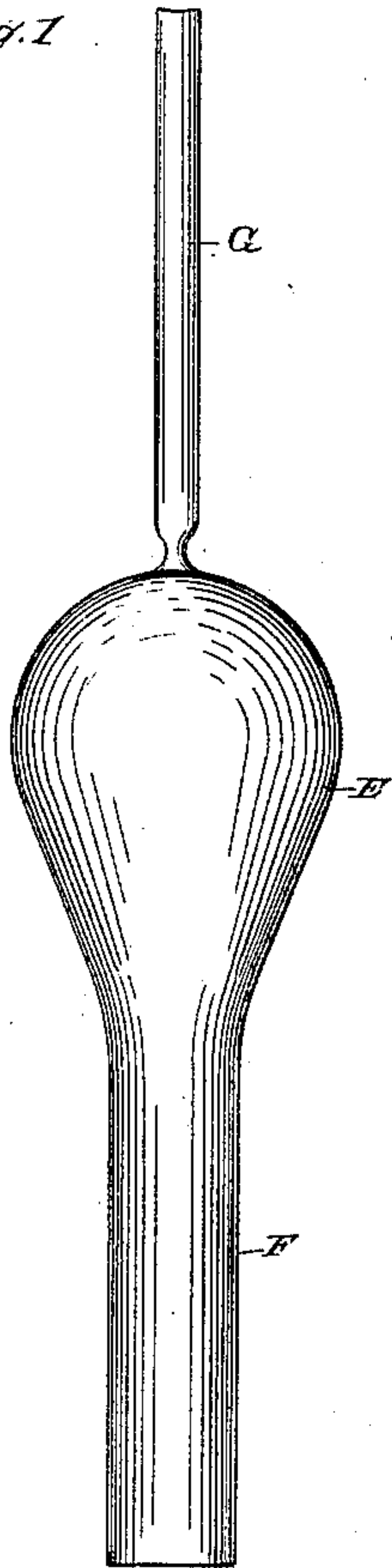


Fig. 2

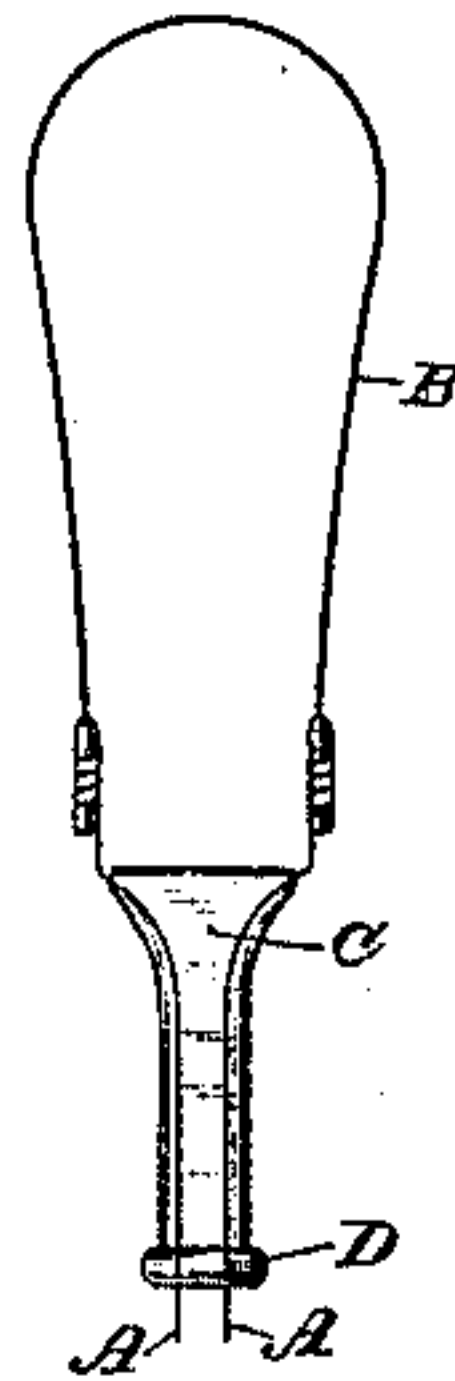


Fig. 5

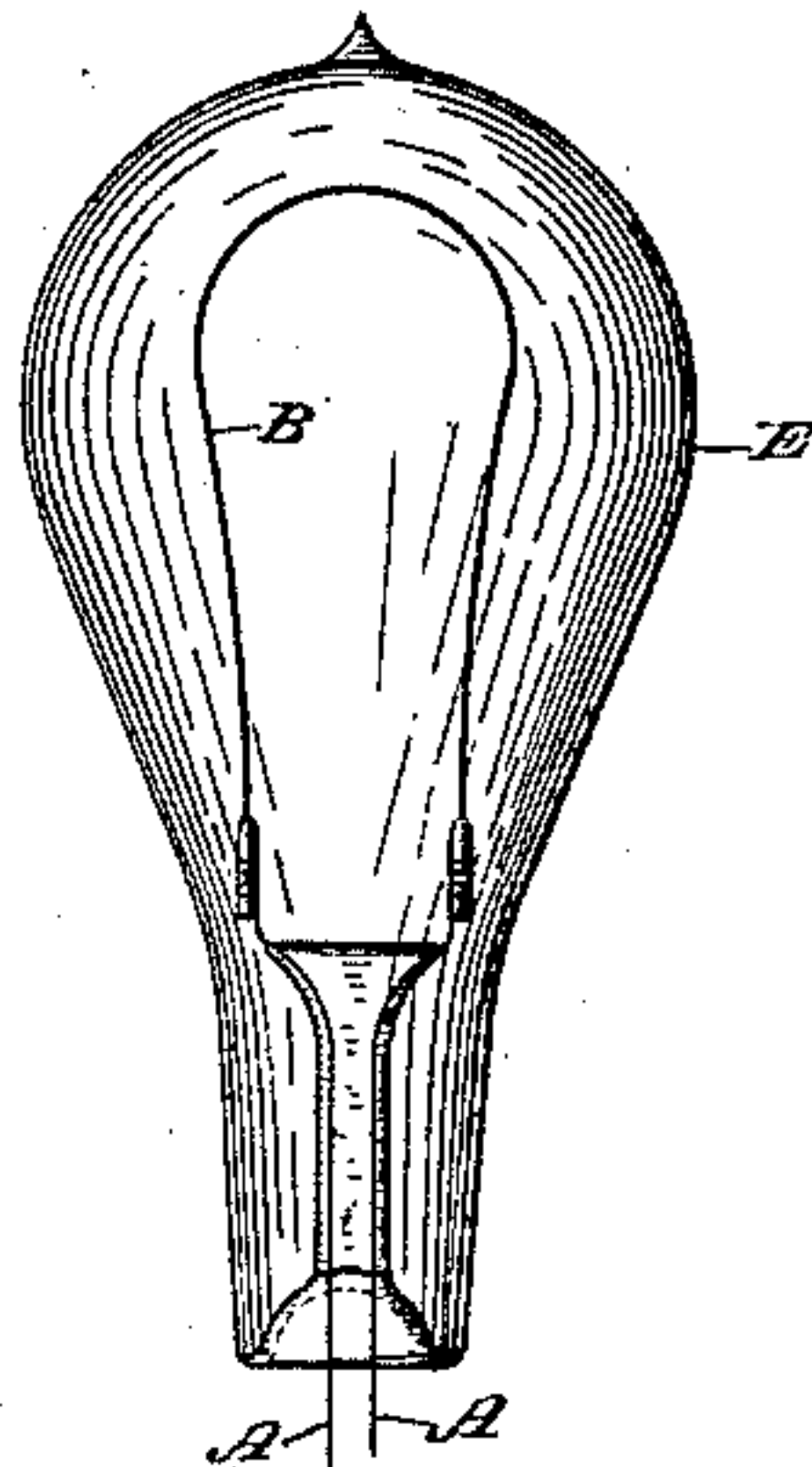


Fig. 3

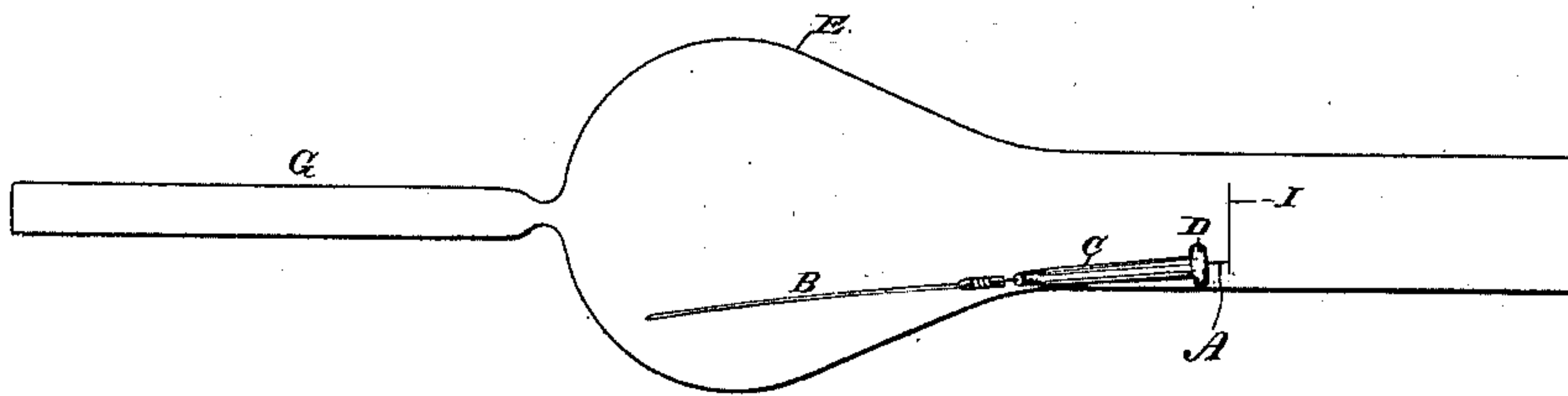
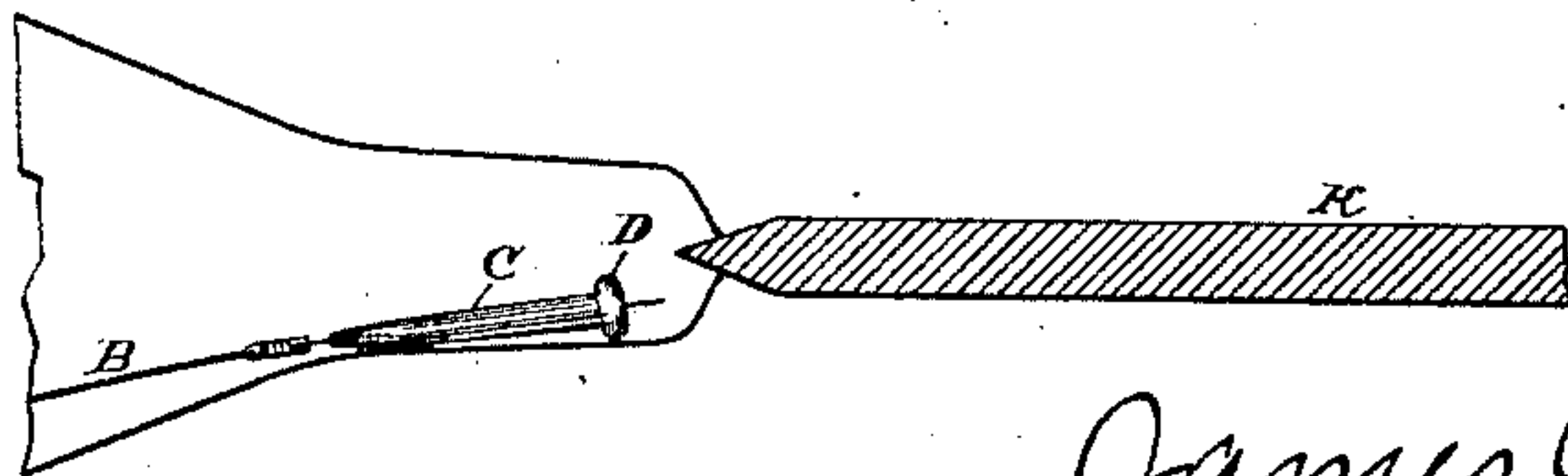


Fig. 4



WITNESSES:

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*Frank B. Murphy.*

INVENTOR

*James A. Vandegrift*  
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# UNITED STATES PATENT OFFICE.

JAMES A. VANDEGRIFT, OF NEWARK, NEW JERSEY.

## INCANDESCENT-LAMP MANUFACTURE.

SPECIFICATION forming part of Letters Patent No. 397,479, dated February 5, 1889.

Application filed November 10, 1888. Serial No. 290,443. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. VANDEGRIFT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Art of Making Incandescent Electric Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is an improved process of making incandescent lamps.

It is designed mainly to cheapen and simplify their manufacture and to produce better lamps. It accomplishes the first by making use of only such steps in the process of associating the different parts of the lamps as may be done by comparatively unskilled operators, and by dispensing entirely with some steps or manipulations that have heretofore been regarded as necessary. It secures the second object by treating the lamps in such manner that impurities are much more effectually excluded from the interior of the lamp-globes than by any other process of manufacture of which I am aware.

The methods heretofore proposed of making incandescent lamps are very numerous and diverse; but no plan has been practically adapted in which in the operation of associating the glass "support" or "stem" or "base," as it is variously designated according to the particular kind of lamp, the gas-flame or the unconsumed gas therefrom, by which the fusion of the glass is secured, is not admitted to some extent to the interior of the globe. One of the objects of my invention is to prevent this, as it is deleterious to a greater extent than is generally supposed.

My invention consists in a series of certain steps which collectively make up a process. I may best explain such process by referring to the drawings, after which I shall point out the part or parts which I believe to be original with me and which I claim as my invention.

In incandescent-lamp factories of the present day it is customary to prepare the carbon conductors and to mount them upon suitable bases or supports, which are afterward associated with the globes. In making lamps in

accordance with my invention two short lengths of platinum wire are held in parallel position by a suitable instrument or tool and a stem of glass is formed around them. This is usually done by holding the wires in a gas-flame and winding the fused end of a stick of glass around them. The ends of the wires are prepared for connection with the stubs of the carbon conductor, which is secured to them after the stem is formed.

In Figure 2, which is a side view of these parts associated, A A are the platinum conductors, B the carbon mounted thereon, and C the glass stem or post. At its lower end it has a slight enlargement, D.

The lamp-globes are usually made at regular glass-works, where they are blown in molds. They are formed as globes with a contracted neck much longer than is required in the completed lamp. When received at the lamp-factories, these globes are "tubulated"—that is to say, small glass tubes are fused to their tops by means of which they are exhausted. Figure 1 is a side view of a globe, E, with its neck F and the attached tube G. Two ways of associating the glass stem C and the globe E have been in vogue heretofore. The neck is cut off at the proper point and the stem united to it, either by making the base or stem of sufficient diameter to close the opening in the neck, or by turning in the edge or rim of the open neck; but in either case the gas-flame in which the joining parts are held has always had an opportunity to penetrate to the interior of the globe through the space between the stem and the neck. In carrying out my process, however, I insert the carbon and its glass stem into the open neck, and push it in slightly beyond the point at which, if secured, it would occupy its proper position in the globe. This point may be determined by the eye; but I generally make a mark or scratch on the neck of the globe to indicate the proper point.

Fig. 3 is a side view of the globe and neck, showing the carbon and the stem inserted therein, as above described.

The letter I indicates the line or mark which is made on the neck.

Holding the globe horizontally the glass-blower then introduces the neck F into the



gas-flame and draws it apart at the mark I, by an easy manipulation rounding off somewhat the closed end of that portion of the neck attached to the globe. In doing this the  
5 carbon and glass stem are not perceptibly displaced if some care is exercised.

While the closed end of the neck is still soft the glass-blower, by means of a pointed instrument of carbon, wood, or other suitable  
10 material, perforates the center of the closed end. The size of the perforation may be only such as will permit the ends of the leading-in wires to pass through. The lamp is then turned up and the end of the glass stem drops  
15 down over the perforation. The ends of the wires A A are then seized by a pair of pinchers, and by well-understood manipulation the end of the stem C is united to the neck, which is entirely closed and sealed. When a smooth  
20 seal is obtained by turning the joint in the gas flame, the air is sucked out through the exhaust-tube sufficiently to produce the re-entrant base, with which lamps of this kind are commonly formed.

Fig. 4 is a side view of the end of the neck of a lamp after it has been drawn apart, and showing the pointed tool K inserted through the end of the neck to perforate it. When the carbon has been properly mounted and  
30 sealed in, the lamps may be exhausted and finished off in any of the usual or desired ways, Fig. 5 being a side view of a completed lamp ready for use. It will now be seen that the distinguishing feature of my invention is  
35 the way in which I associate the carbon and the lamp-globe. As I have heretofore explained, the base or stem for the carbon has in all cases been sealed in at the time of its introduction into the lamp. While I intro-  
40 duce it into the lamp and then close up the opening in the neck and then make a perforation in the neck for drawing the wires through I fuse the glass stem to the neck.

In certain respects this process as herein  
45 specifically described may be varied, the main object being to work upon a closed joint between the stem and the globe-neck from the outside in securing their fusion, in order that the gas-flame may not penetrate to the inte-  
50 rior of the globe.

What I claim is—

1. The improvement in the art of making incandescent lamps, which consists in introducing into a glass globe the glass base or stem surrounding the leading-in conductors  
55 on which the carbon is mounted, then closing the globe or neck, and then perforating the same for the passage of the leading-in conductors and fusing or sealing in the glass base or stem, as set forth. 60

2. The improvement in the art of making incandescent lamps, which consists in introducing the mounted carbon and its glass base or stem into the globe, then drawing off the neck of the globe and closing the same, then  
65 perforating the closed end of the neck and sealing the glass stem over or in such perforation, as set forth.

3. The improvement in the art of making incandescent lamps, which consists in intro-  
70 ducing the mounted carbon and its glass base or stem into the globe through its open neck, then heating and drawing off the end of the neck and perforating the closed end attached to the globe while out of the gas flame, and  
75 then sealing the end of the glass stem to the neck, as set forth.

4. The improvement in the art of making incandescent lamps, which consists in introducing the mounted carbon, with its glass base  
80 or stem, into the open neck of the globe, heating the neck and drawing off a portion of its end and rounding off the closed end attached to the globe, perforating the said rounded end, and then sealing the end of the stem over the  
85 opening, with the ends of the leading-in wires projecting through the same, as set forth.

5. The improvement in the art of making incandescent lamps, which consists in uniting  
90 the glass base or stem surrounding the leading-in wires to the globe or its neck over the inside edges of a contracted opening in the same, through which the ends of the leading-in wires project, as and for the purpose set forth.

JAMES A. VANDEGRIFT.

Witnesses:

THOMAS C. PROVOST,  
CHAS. E. BALDWIN.