

(No Model.)

2 Sheets—Sheet 1.

J. V. NICHOLS.

MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

No. 266,187.

Patented Oct. 17, 1882.

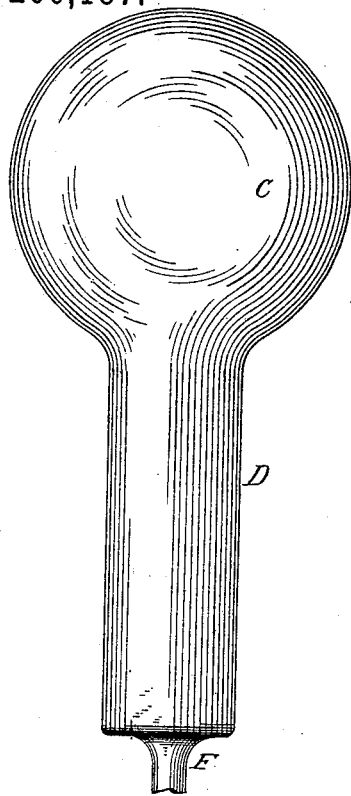


Fig. 1.

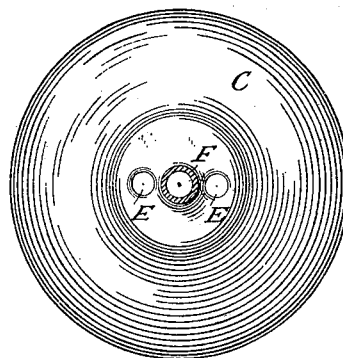


Fig. 2.

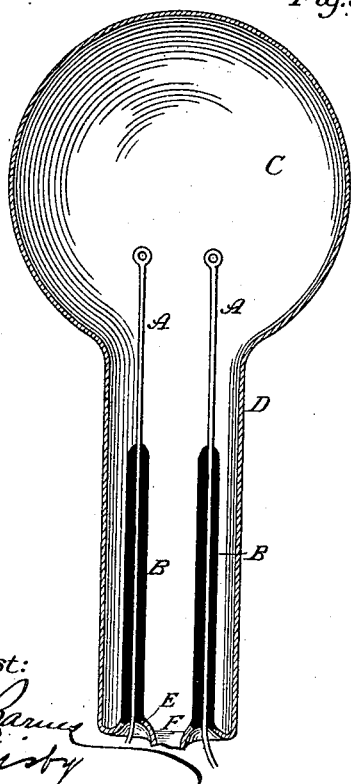


Fig. 3.

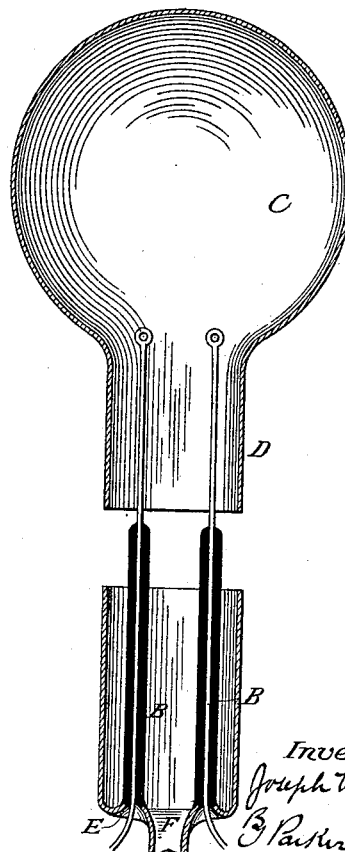


Fig. 4.

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Fig. 5.

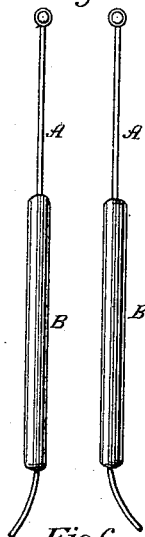
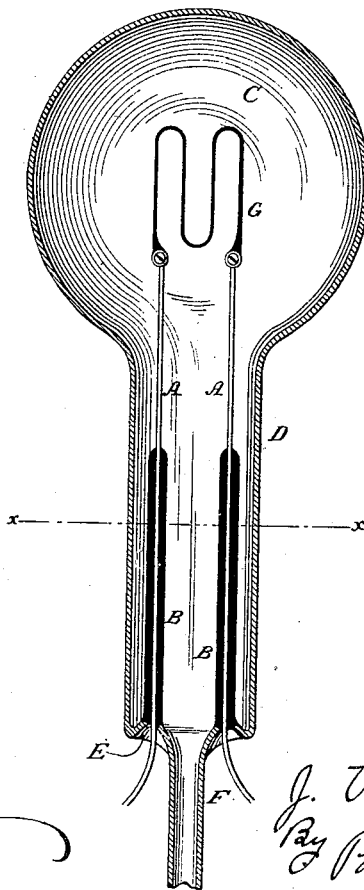


Fig. 6.



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# UNITED STATES PATENT OFFICE.

JOSEPH V. NICHOLS, OF BROOKLYN, ASSIGNOR TO THE UNITED STATES  
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## MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 266,187, dated October 17, 1882.

Application filed March 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH V. NICHOLS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Manufacture of Incandescent Electric Lamps, of which the following is a specification, reference being had to the accompanying drawings.

My invention consists in an economical and practicable method of making incandescent lamps, such as are now generally used, and which consist of an exhausted glass globe containing a conductor of carbon or other refractory substance, supported by metallic conductors sealed into the globe. The said method is substantially as follows:

I mold or blow a globe having a neck of the desired length, which neck is drawn out into a tube. While the glass is soft, or at any other time, I form two holes in it at the part where the neck tapers down into the tube. Through these holes I then introduce the conducting-wires, which have been previously coated with glass or other vitreous material, and by the application of heat, and by proper and well-understood manipulation, I seal them in. The lower part of the neck is then cut off, and a carbon or other conductor mounted on the wires, which should be of sufficient length to bring the carbon to about the center of the globe. After being properly attached, the carbon is inserted into the globe and the neck welded together by heat. The air is then to be exhausted from the tube drawn from the neck, or by an exhaust-tube formed on the globe at any point desired. This forms the general process of manufacture, which, by reference to the drawings, will be explained more in detail.

A globe, as C, with a neck, D, is first formed, the neck being drawn out into a tube, F. Figure 1 represents the globe thus formed. By proper manipulation the tube F may be pressed upward, so that the part between the neck and tube is formed nearly square, as shown in the drawings. This is not, however, essential. Holes E E are then formed on each side of the tube F, as indicated in Fig. 2, which is an end view of the neck and tube F. Into these holes

conducting-wires, which by preference have received a coating of glass or vitreous cement, are introduced and sealed. These conductors (designated by the letters A A) are represented in Fig. 5, and are there shown coated with glass, or with what I term a "metallo-vitreous cement," which is made by mixing together and fusing silica, potash, or soda, and various metallic oxides, as explained in patents granted to me.

The conductors A may be of various metals, though platinum is preferred, unless the coatings B B of metallo-vitreous cement be used and caused to envelop nearly the whole portion of the wires that are within the globe. These coatings may be applied by heating the wires and winding about them a desired quantity of fused glass or cement, or by passing the wires through tubes of the same and welding these to the wires by heat. The ends of the wires are to be provided with clamping-surfaces or other means of mounting the carbons thereon. The lamp as it appears after the sealing in of the covered wires is shown in Fig. 3.

The next step is to divide in any of the ways well known to glass-blowers the glass neck D, as is illustrated in Fig. 4. The carbon G is then attached to the wires A and the two parts of the neck joined.

Fig. 6 illustrates the lamp after the sealing in of the wires and mounting of the carbon, but previous to exhaustion, the line of union between the two parts of the neck being indicated by the line *xx*. The globe is finally exhausted of air and sealed by means of the tube F.

The tube F is not necessarily formed as described. The lower end of the neck may be simply softened and drawn or welded together, the perforations then made, and the exhaust-tube formed on the globe or neck at any point. The method described is, however, believed to be the most economical.

The same or similar processes of manufacture may be followed in forming lamps of other shapes than that herein described. It may also be stated that the exact order of the various operations described is not essential—as, for instance, the globe may be first formed and

then divided prior to the introduction of the wires.

Having now described my invention, what I claim is—

5 1. The method or process of manufacturing incandescent lamps, which consists in forming a globe with a neck, closing the end of the neck, forming therein perforations, sealing in said perforations wires coated with vitreous material, dividing the neck, mounting the carbon  
10 on the wires, and joining the two parts to form a complete lamp, substantially in the manner hereinbefore set forth.

15 2. The method of forming incandescent lamps, which consists in sealing into a receiver made in one piece conducting-wires, dividing the receiver in two parts, then attaching a carbon to the conducting-wires, and joining the two parts of the receiver together, substantially in the  
20 manner described.

3. The method or process of manufacturing incandescent lamps, which involves the following operations, to wit: forming a closed receiver of glass, perforating the same, and sealing  
25 metallic conductors in the perforations, cutting or dividing that portion of the receiver containing or adapted to contain the metallic conductors from the main portion, mounting the carbon on the said conductors, and joining the  
30 two parts of the receiver together, all substantially as set forth.

In testimony whereof I have hereunto set my hand this 9th day of March, 1882.

JOSEPH V. NICHOLS.

Witnesses:

PARKER W. PAGE,  
W. FRISBY.