

No. 810,466.

PATENTED JAN. 23, 1906.

F. H. BLACKBURN.
PROCESS OF MAKING INCANDESCENT LAMPS.
APPLICATION FILED MAR. 2, 1905.

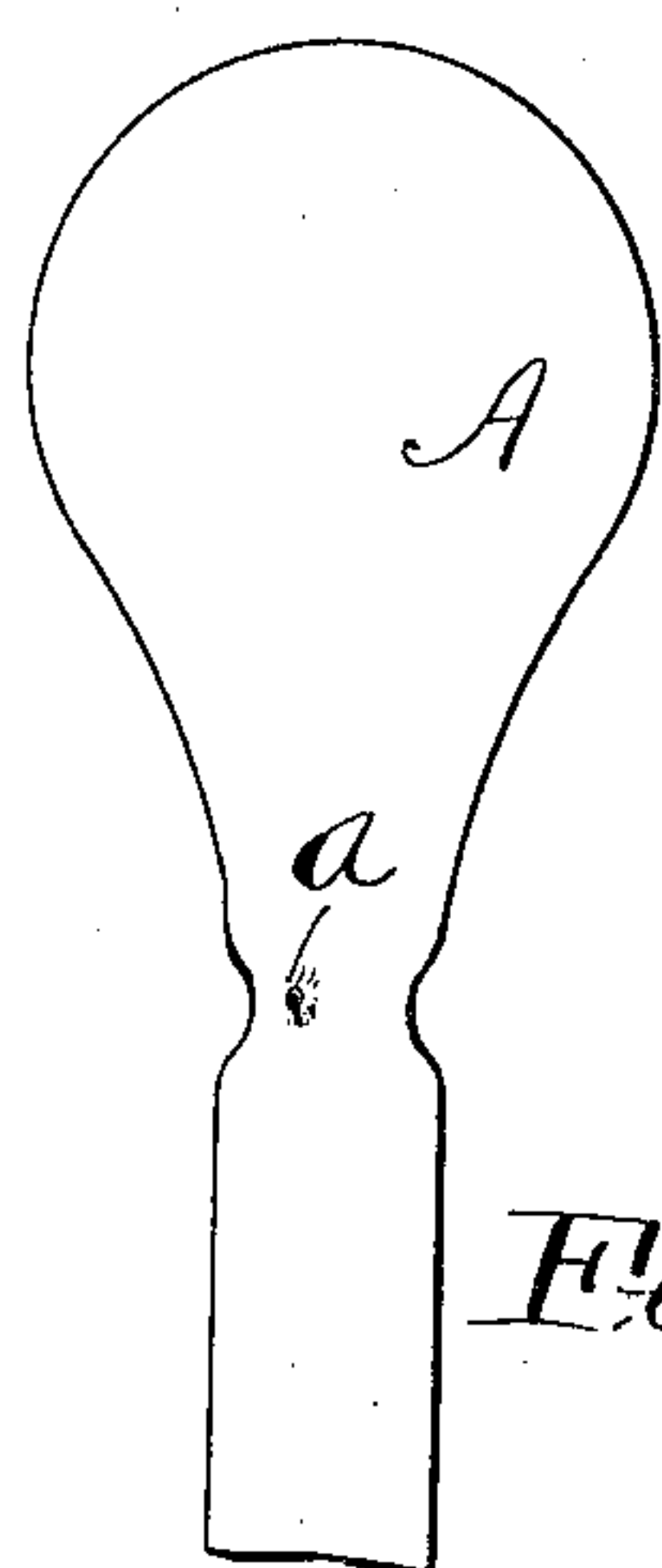


Fig. 1.

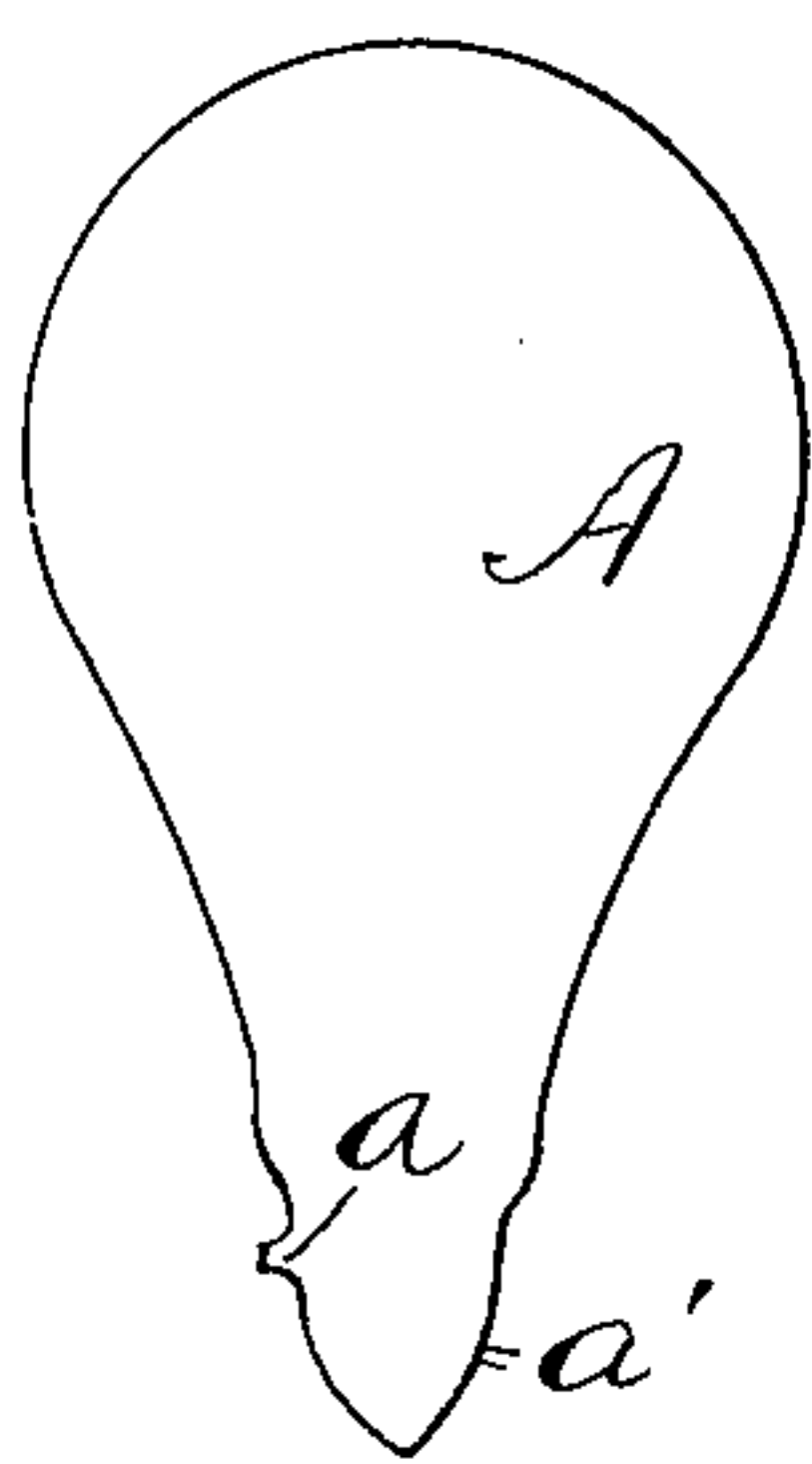


Fig. 2.

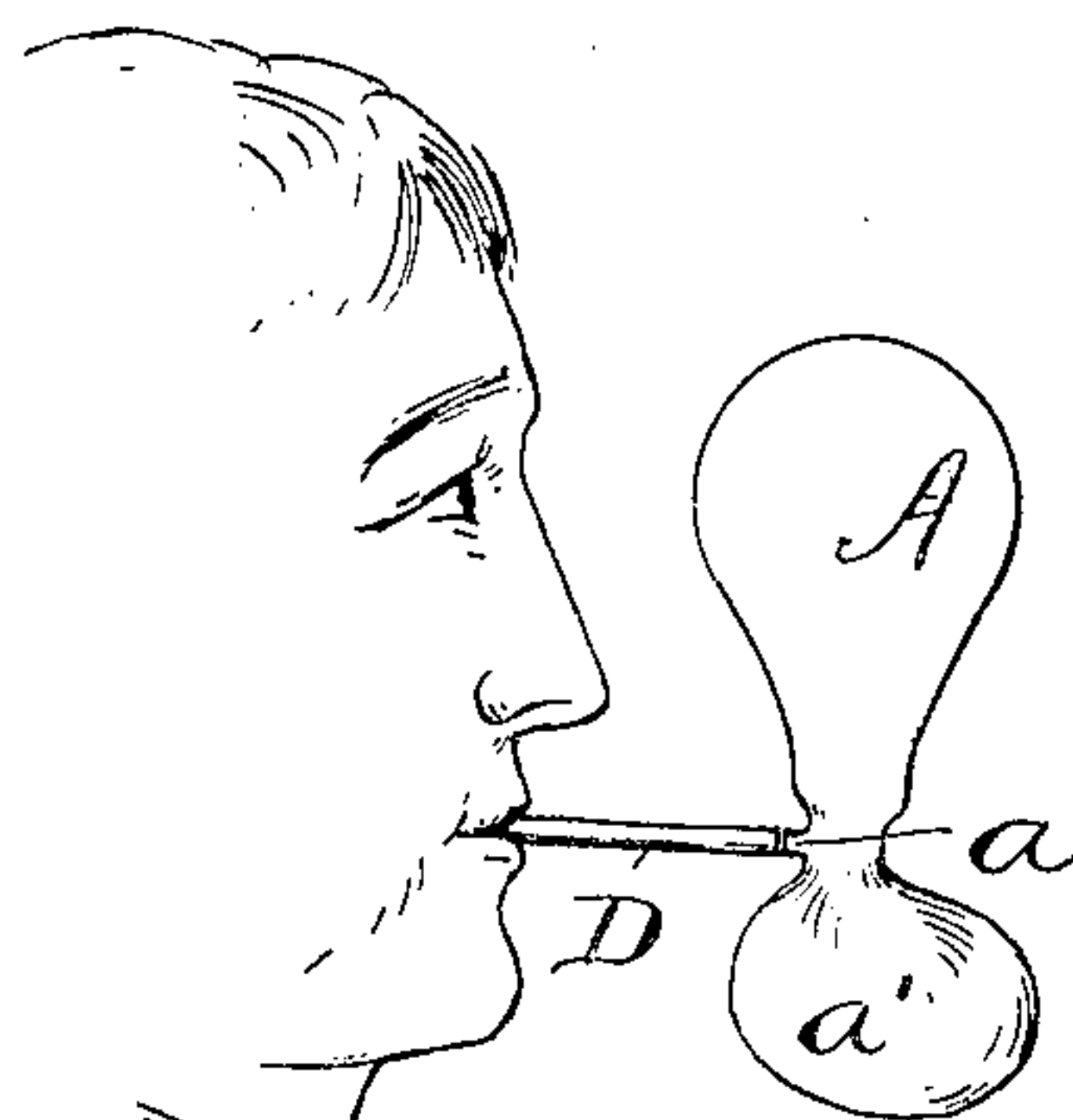


Fig. 3.

Fig. 5.

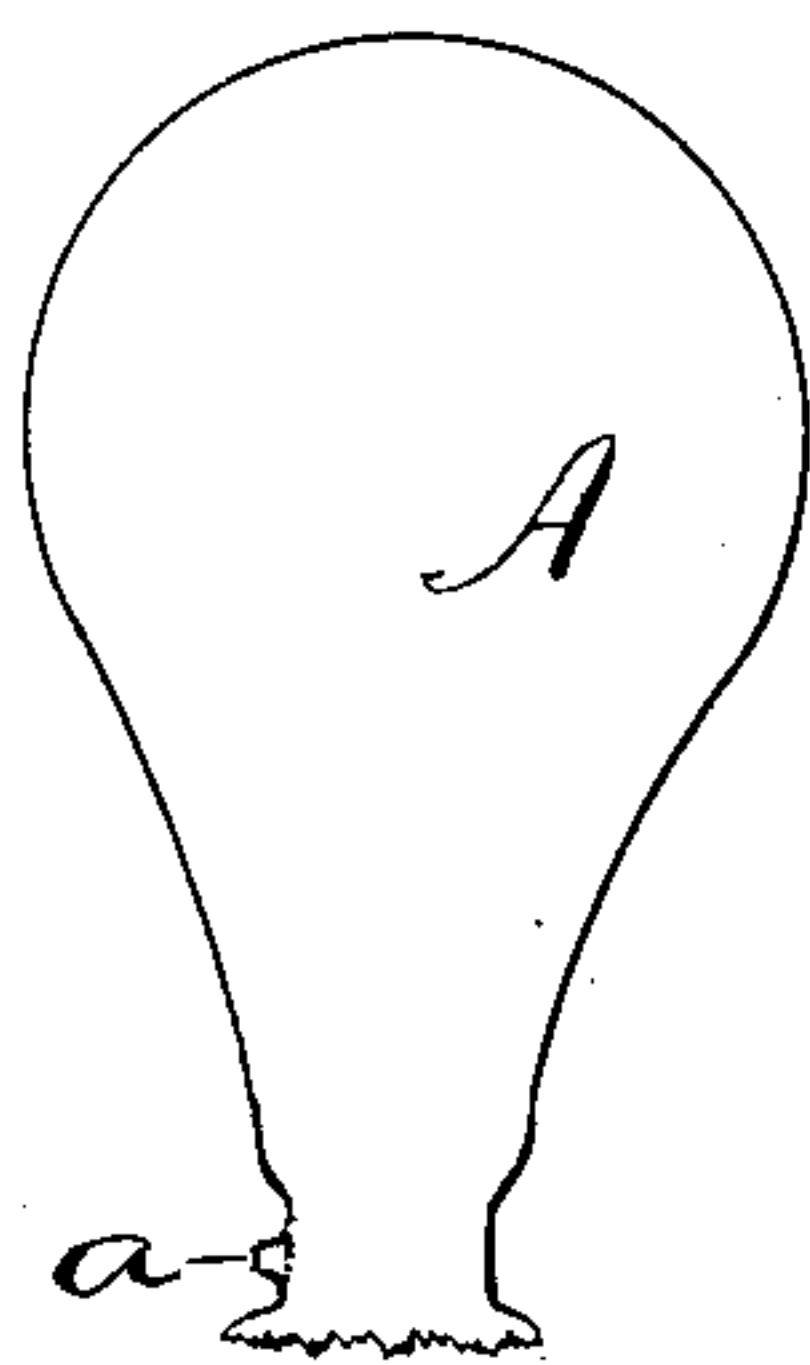


Fig. 4.

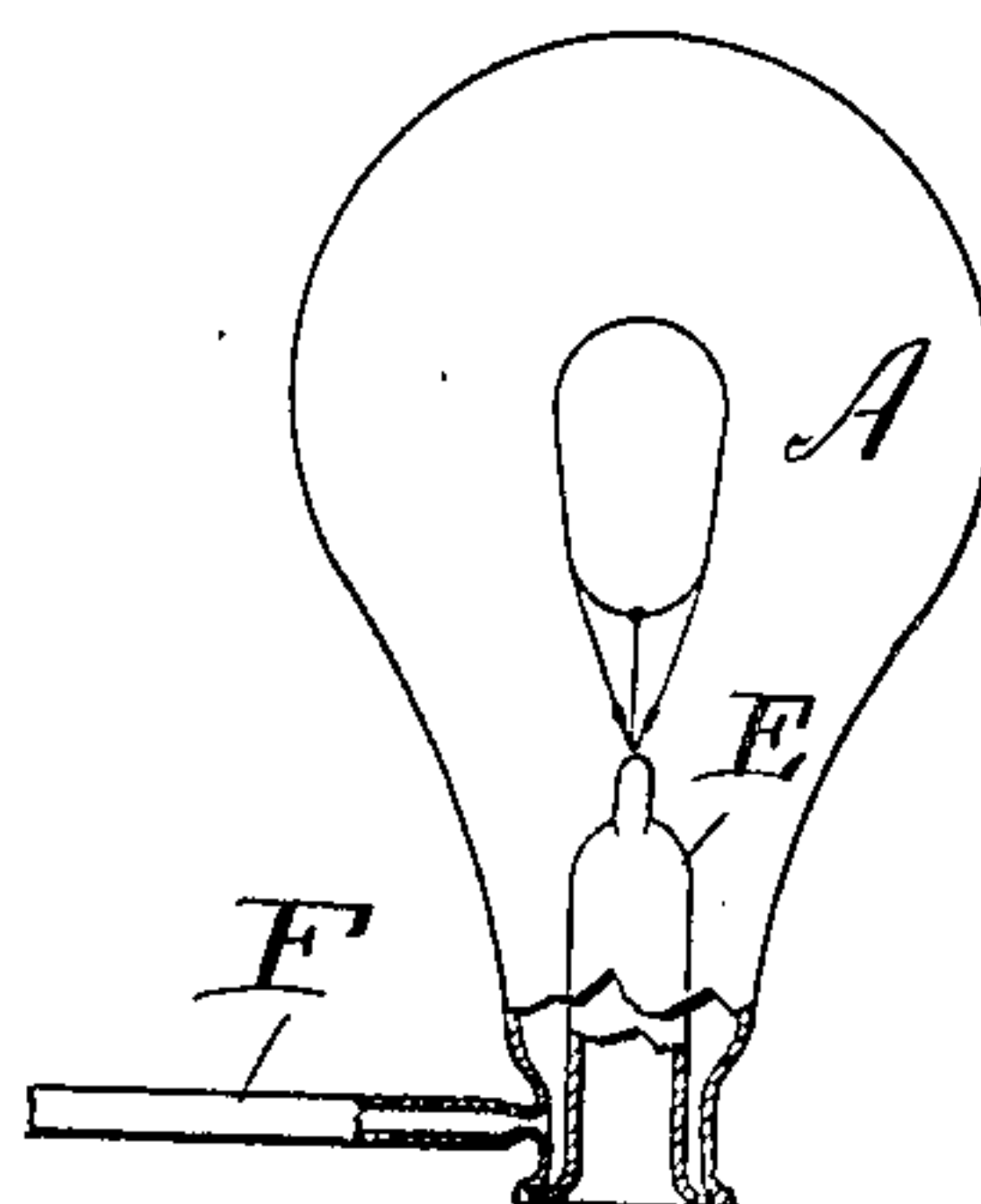
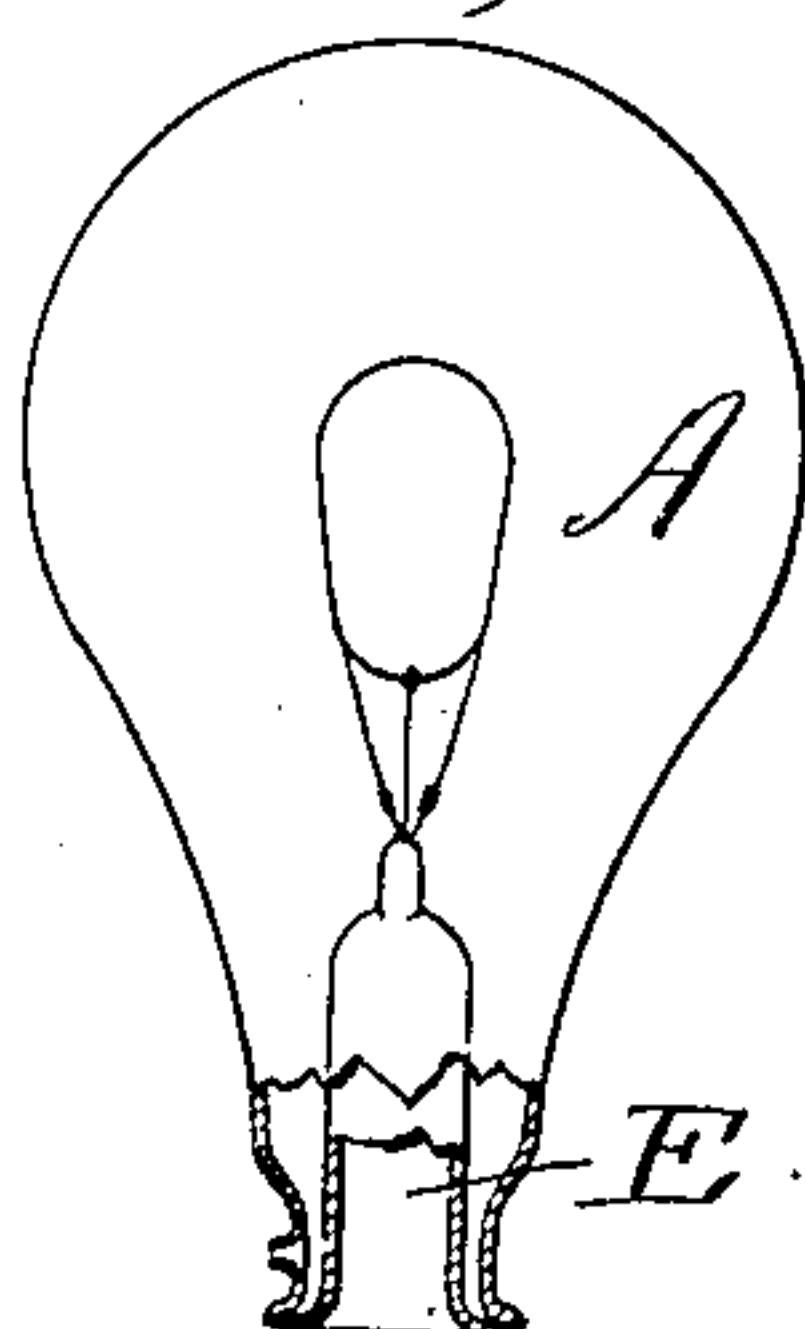


Fig. 6.

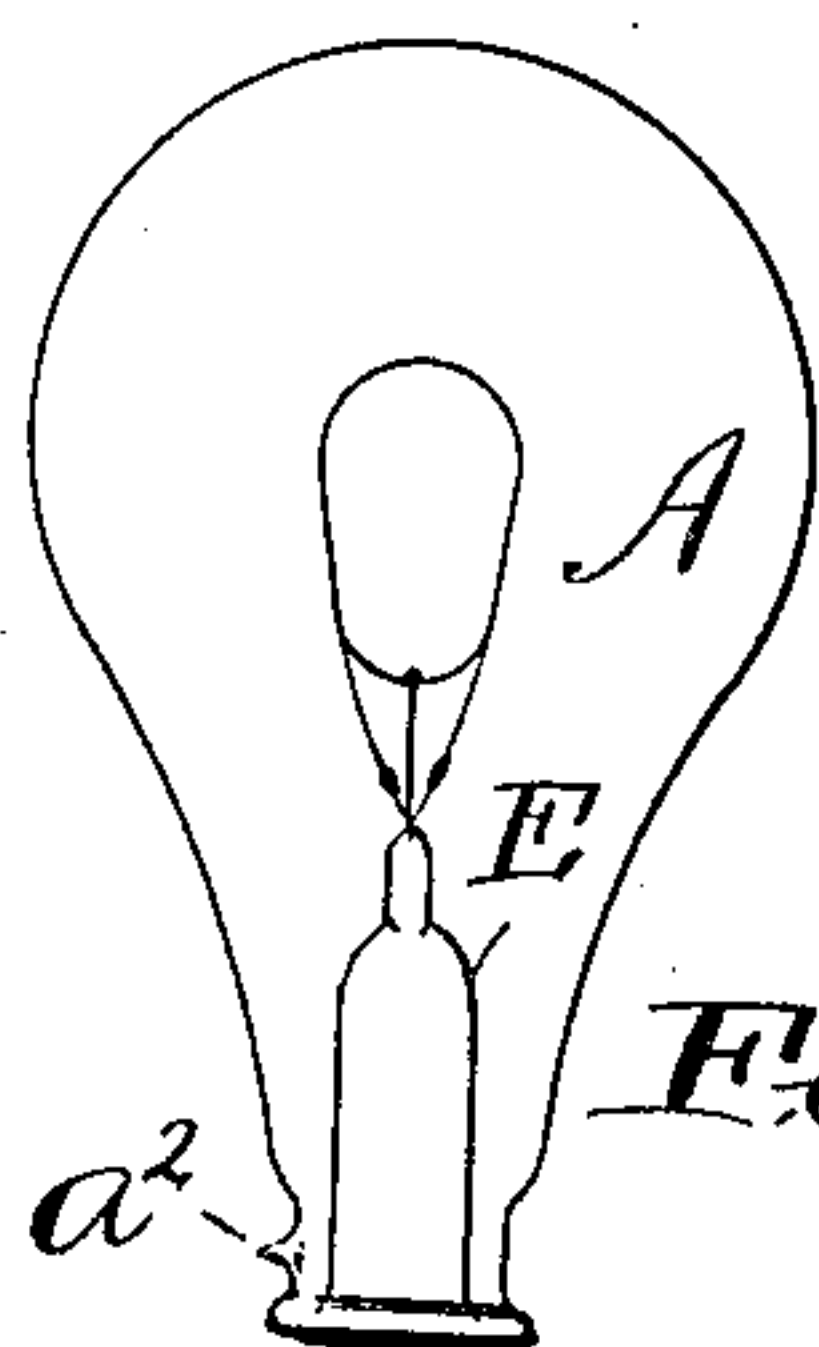


Fig. 7.

Witnesses.
E. B. Gilchrist
J. Kohn

Inventor
Frank H. Blackburn,
By his Attorneys,
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UNITED STATES PATENT OFFICE.

FRANK H. BLACKBURN, OF FOSTORIA, OHIO, ASSIGNOR TO THE NATIONAL ELECTRIC LAMP COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

PROCESS OF MAKING INCANDESCENT LAMPS.

No. 810,466.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed March 2, 1905. Serial No. 248,023.

To all whom it may concern:

Be it known that I, FRANK H. BLACKBURN, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented a certain new and useful Improvement in Processes of Making Incandescent Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention is a process by which to construct from the globe as it comes from the glass-blower a certain tipless incandescent lamp ready to have the air exhausted therefrom.

The lamp which this process is intended to make is substantially that which forms the subject-matter of my application, Serial No. 187,887, filed January 6, 1904. In endeavoring to make such a lamp commercially by methods employed for making ordinary incandescent lamps the breakage was appalling. The globes for all lamps are blown and come from the glass-blower with a long neck attached, the greater portion of which has to be removed. The usual process for the removal of this surplus neck is to hold the bulb with the neck down and rotate it on a vertical axis while a blowpipe - flame plays against it. As the glass softens the neck below this plane settles down and finally drops off, and the hot edges of the neck coming into contact seal themselves together. Then the tubulation - tube, which was previously attached to the top of the globe, is used for blowing off the end of the hot sealed neck.

In constructing the tipless lamp described in the application above referred to it is not permissible to attach a tubulation - tube at any point except the neck. It was found that when such a tube was attached so as to project laterally from the neck before the neck was blown off it was practically impossible to handle such globe and to subject it to the various and subsequent manipulations without breaking a very large percentage of the tubes and many of the globes.

I have discovered, but it appears not to have been suspected by any one before, that when a sealed neck having a small hole through it is heated below said hole and softened this softened portion can be expanded and blown off by a puff of air blown into said

hole from a nozzle or tube having no connection or even contact with the globe.

In practicing my invention on bulbs as they come from the glass-blower the following operations are performed: First, forming a small hole in the neck; second, fusing off the surplus neck and sealing together the edges of that part of the neck which is not removed; third, blowing a puff of air onto said hole through a nozzle or tube which is entirely independent of the bulb; fourth, sealing in the mount, and, fifth, sealing an exhausting-tube to the neck over the aforesaid hole therein, and, finally, after the air has been exhausted from the bulb sealing off of this exhausting-tube.

In the drawings, Figure 1 represents the globe A after it has been subjected to the first step—viz., the formation of the small hole *a* in the neck. Fig. 2 represents the globe after the redundant part of the neck has been sealed off. Fig. 3 shows in what manner the third step of the process may be carried out—viz., by blowing through an independent tube D onto the hole in the neck—whereby the softened sealed end *a'* of the neck is expanded and exploded. Fig. 4 represents the bulb after this step has been performed. Fig. 5 represents the lamp after the mount E has been sealed onto the same. Fig. 6 represents the lamp after the exhaustion-tube F has been sealed onto the same over the hole *a* in the neck. Fig. 7 represents the lamp after the air has been exhausted from the globe and the tube F sealed off at *a*².

I claim—

1. The process of making incandescent lamps consisting in forming an opening into the globe substantially at the surface thereof, heating the neck of the globe to seal off the end thereof, then applying to such opening a tube separate from the globe and forcing pressure through the tube to blow off the end of the globe.

2. The process of making incandescent lamps consisting of taking a globe having an open neck, forming an opening into it without substantial projection thereat, sealing off by heat the neck of the globe, then applying to the opening a tube unsealed thereto, and by air-pressure through the tube blowing off the end of the globe to free it.

3. The process of making tipless incandes-

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cent lamps consisting in taking a globe having a neck, forming a small opening in it near the point where the neck joins the globe proper, sealing off by heat the neck of the globe just below such opening, then blowing 5 air into the globe through such opening by means of a tube unsealed thereto the air blowing off the end of the neck.

4. The process of making tipless incandescent lamps consisting in taking a globe having 10 a neck, forming a small opening into it near the point where the neck joins the globe proper, sealing off by heat the neck of the globe just below such opening, then blowing 15 air into the globe through such opening by means of a tube unsealed thereto, the air blowing off the end of the neck, then placing the filament and its support in the globe, fusing

the support to the globe below such opening, and then fusing a tube to the opening. 20

5. The process of making incandescent lamps consisting in forming a small hole in the neck, fusing off the surplus neck and sealing together the edges of that part which is not removed, blowing a puff of air into said 25 hole through a tube which is independent of the bulb, sealing in the mount, and sealing an exhausting-tube to the neck over the aforesaid hole.

In testimony whereof I hereunto affix my 30 signature in the presence of two witnesses.

FRANK H. BLACKBURN.

Witnesses:

MARY F. ROBINSON,
ETHEL STAHL.