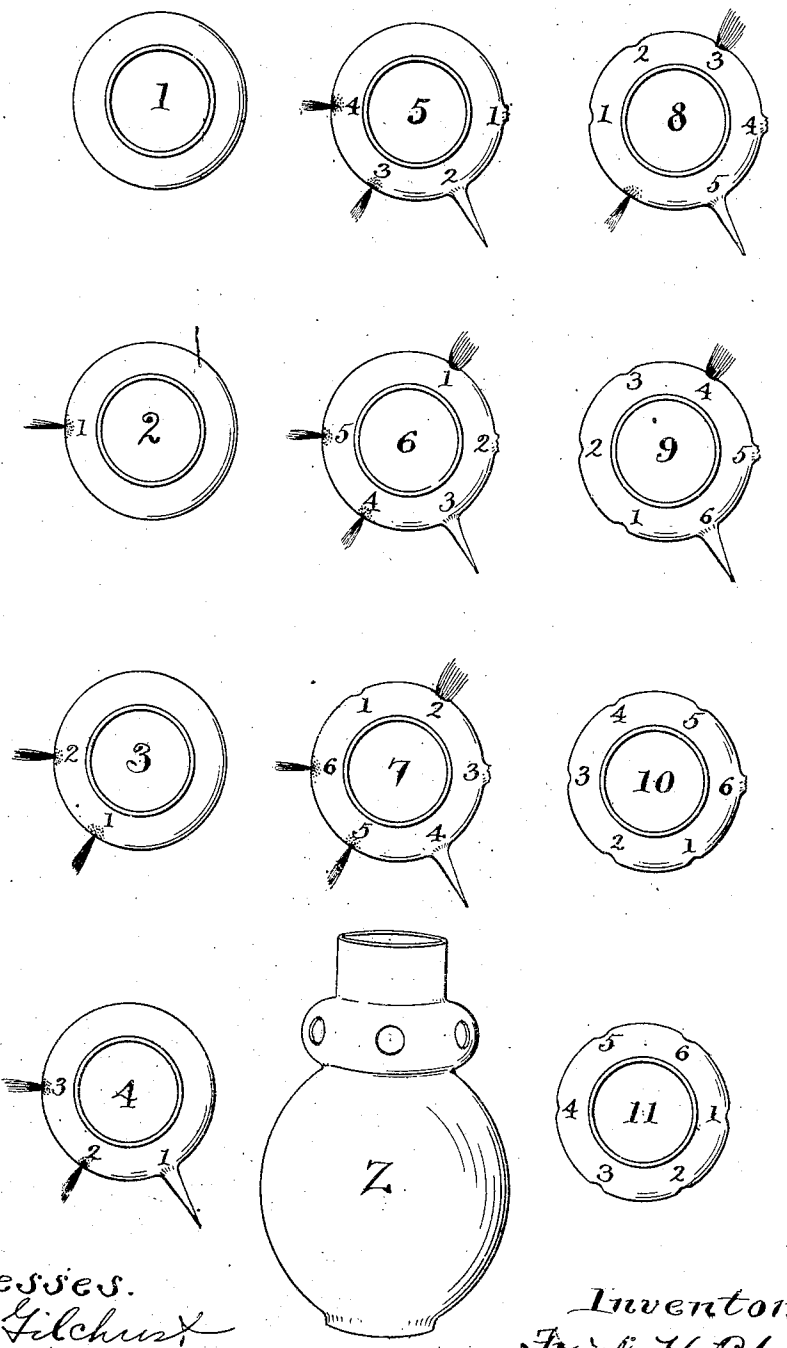
No. 810,463. PATENTED JAN. 23, 1906.

F. H. BLACKBURN.

PROCESS OF MAKING AIR HOLE GLASSWARE.

APPLICATION FILED FEB. 24, 1905.



Witnesses.
E. B. Gilchrist
J. L. Tohn

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 AIR-HOLE GLASSWARE.

No. 810,463. Specification of Letters Patent. Patented Jan. 23, 1906.

Application filed February 24, 1905. Serial No. 247,164.

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 Air-Hole Glassware, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Air-hole glassware consisting of a suitably-shaped globe with holes through it is much used in incandescent gas-lighting. It is a difficult matter to make the holes in the ware smooth, so as to be neat in appearance and so that the glassware shall not be subjected to internal strains. I have devised a process for making such holes which is the subject of the present invention. Such process consists, essentially, of heating the glassware at the spot where the hole is to be, drawing out from the heated spot a long projection or horn, removing such horn preferably by breaking it off, then grinding the rough edge caused by such removal, and finally glazing the edge of the hole. I have also found that after the process is started several of the operations may be carried on simultaneously. This is also a feature of my invention.

The drawings are in the nature of a diagram showing the glassware in the various stages up to the complete product, where there are six holes in it. In making these holes by my process the steps are repeated in a cycle of eleven positions. These are illustrated in plan in the diagram, and the final product is shown in side elevation.

Referring to the diagram, the various positions are as follows:

No. 1. Before any operation is performed.

No. 2. The first spot receives a preliminary heating.

No. 3. The first spot receives an intense heating and the second spot a preliminary heating.

No. 4. The first spot is drawn out to make an external attenuated horn, the second spot is intensely heated, and the third spot preliminarily heated.

No. 5. The horn having been broken off and the rough edges ground down, a horn is draw out from the second spot, the third spot is intensely heated, and the fourth spot preliminarily heated.

No. 6. The ground edges are glazed at the first spot, which thus becomes a completed hole, the second spot is ground, the third spot drawn out, the fourth spot intensely heated, and the fifth spot preliminarily heated.

No. 7. The second spot is now glazed, the third spot ground down, the fourth spot drawn out, the fifth spot intensely heated, and the sixth spot preliminarily heated.

No. 8. The third spot is now glazed, the fourth spot ground down, the fifth spot drawn out, and the sixth spot intensely heated.

No. 9. The fourth spot is now glazed, the fifth spot ground, and the sixth spot drawn out.

No. 10. The fifth spot is glazed and the sixth spot ground.

No. 11. The sixth spot is glazed, completing the operation and producing air-hole glassware, as illustrated at Z in the drawing.

I claim—

1. The process of making air-hole glassware consisting in heating a spot thereon, drawing out a horn from the outside of the ware at such a heated spot, removing said horn, grinding the rough edges, and glazing the hole.

2. The process of making air-hole glassware consisting of subjecting spots on the glassware successively to a preliminary heating, then an intense heating, then drawing out a horn on the outside of the ware at the heated spot, then breaking off said horn, then grinding the rough edges, and then glazing the hole.

3. The process of making air-hole glassware consisting of successively subjecting equidistant spots thereon to the action of a heating-flame, drawing out from the outside of the ware a horn or projection from the heated spots successively while the preceding spot is being heated, then removing the horn and grinding the rough edges and glazing the hole, said operations being performed one at one spot while another is going on at another spot.

4. The process of making air-hole glassware consisting in heating spots thereon, moving such spots away from the surrounding surface of the glassware to make horns, removing such horns, grinding the rough edges, and glazing the holes.

5. The process of making air-hole glass-

ware consisting of successively subjecting equidistant spots thereon to the action of a heating-flame, forming a horn or projection from the heated spots successively while the preceding spot is being heated, then removing the horn and grinding the rough edges, said operations being performed one at one spot while another is going on at another spot.

6. The process of making air-hole glassware consisting in heating a spot thereon, forming a projection at such heated spot, removing such projection and grinding the rough edge thereat.

7. The process of making air-hole glassware consisting in subjecting spots on the glassware successively to a preliminary heating, then an intense heating, then forming a horn on the ware at the heated spot, then breaking off said horn, and then grinding the rough edges.

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

FRANK H. BLACKBURN.

Witnesses:
H. S. BLACK,
F. C. MAXHEIMER.