G. W. BLAIR.

FINISHING GLASSWARE.

No. 193,314. Patented July 24, 1877.

Fig. 1.

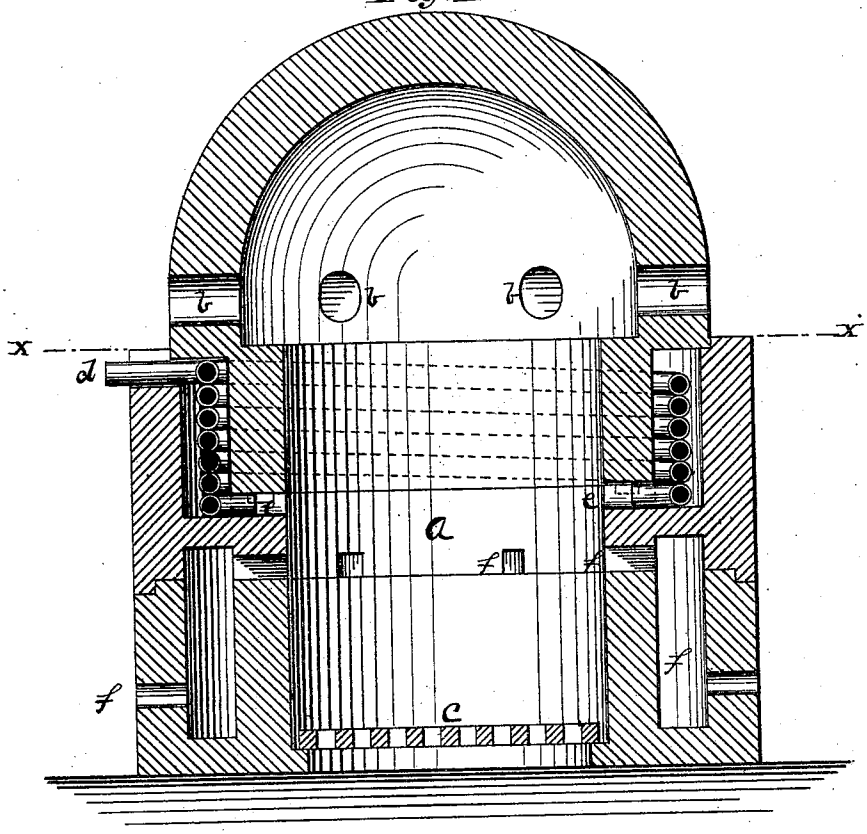
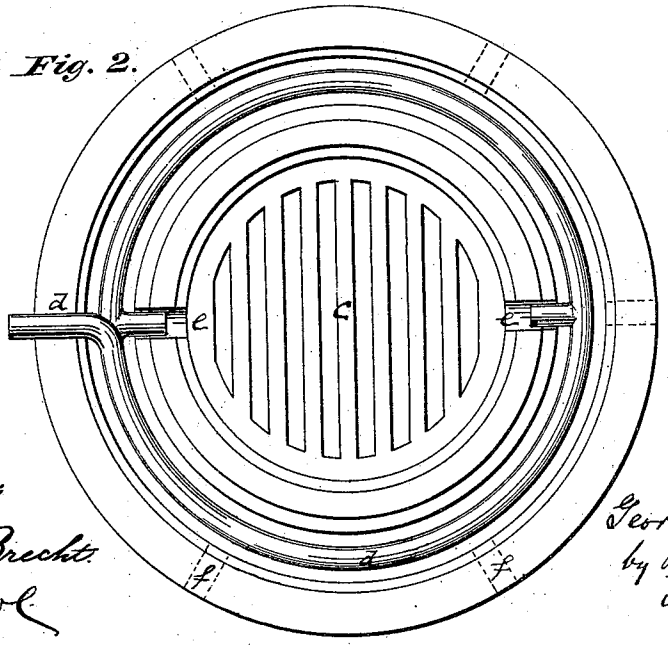


Fig. 2.



Witnesses:

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GEORGE W. BLAIR, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN FINISHING GLASSWARE.

Specification forming part of Letters Patent No. **193,314**, dated July 24, 1877; application filed May 29, 1877.

To all whom it may concern:

Be it known that I, GEO. W. BLAIR, of the city of Pittsburg, county of Allegheny, State of Pennsylvania, have made a certain new and useful Improvement in the Finishing of Glassware, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a "glory-hole" furnace, and Fig. 2 is a section through *x x*, Fig. 1.

Like letters of reference indicate like parts in each.

My invention relates to that class of glass-finishing furnaces which are vulgarly known as "glory-holes," the name being applied to them on account of the great brilliancy of flame in the "work-holes" and radiating therefrom. Glassware requiring to be finished by forming operations must be reheated or "warmed in" in order to render it sufficiently plastic to be shaped by the tools. This reheating is done in the work-holes of the glory-hole furnace. The article is caught in a "snap" and presented to the flame in the work-holes until brought to the required plasticity.

There is a great objection to the reheating operation, and one which is the cause of serious loss to the manufacturer. It is the discoloration of the glass vulgarly known as "sulphuring." The exact cause of it has never been satisfactorily determined. It has been explained in various ways; but it is a fact that it has never heretofore been entirely prevented.

The best results have been obtained by the use of gas as fuel; but even this does not entirely prevent it, and has the objection of being very expensive.

I have discovered by practical experience that the use of steam, and more especially of superheated steam, in the combustion-chamber, almost, if not entirely, prevents this discoloration, and gives a far better result than any heretofore obtained by the use of ordinary fuel.

The injection of the steam into the flame below the work-holes has the effect of destroying or neutralizing in some way the objectionable effect otherwise heretofore uniformly produced with such fuel.

My experience in the use of this invention in my own works has been that the natural brilliancy of the glass is thereby preserved in the finishing operation.

The drawings illustrate the construction of an ordinary form of glory-hole furnace.

It has a combustion-chamber, *a*, the dome of which is known as the "warming-in chamber." The work-holes *b* are made in the sides of the latter. The grate is shown at *c*; the air-opening at *f*. I surround the chamber *a* with a coil of steam-pipe, *d*, having two discharge-openings, *e*. The steam is superheated by the furnace while passing through the coil.

These pipes may be built in the wall or formed as flues in the wall, and may discharge the steam from any desired number of openings, or from small perforations made in any part of the entire circuit of the same.

It is not necessary that the steam should be superheated, and in case it is not desired to be so the steam-pipes can enter directly through the walls of the furnace, and not encircle them, or be otherwise so arranged as to superheat the steam.

I am aware that steam has been used in glass-melting and other furnaces to aid in the combustion of smoke; but I am not aware of its use as an agent to clarify the flame of known and commonly used fuels to render them suitable for the purpose of finishing glassware.

I therefore claim as my invention—

The process herein described, which consists in the application of steam in a glass-finishing furnace as an agent to clarify the flame, and prevent the discoloration of the glass, substantially as described.

GEO. W. BLAIR.

Witnesses:
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