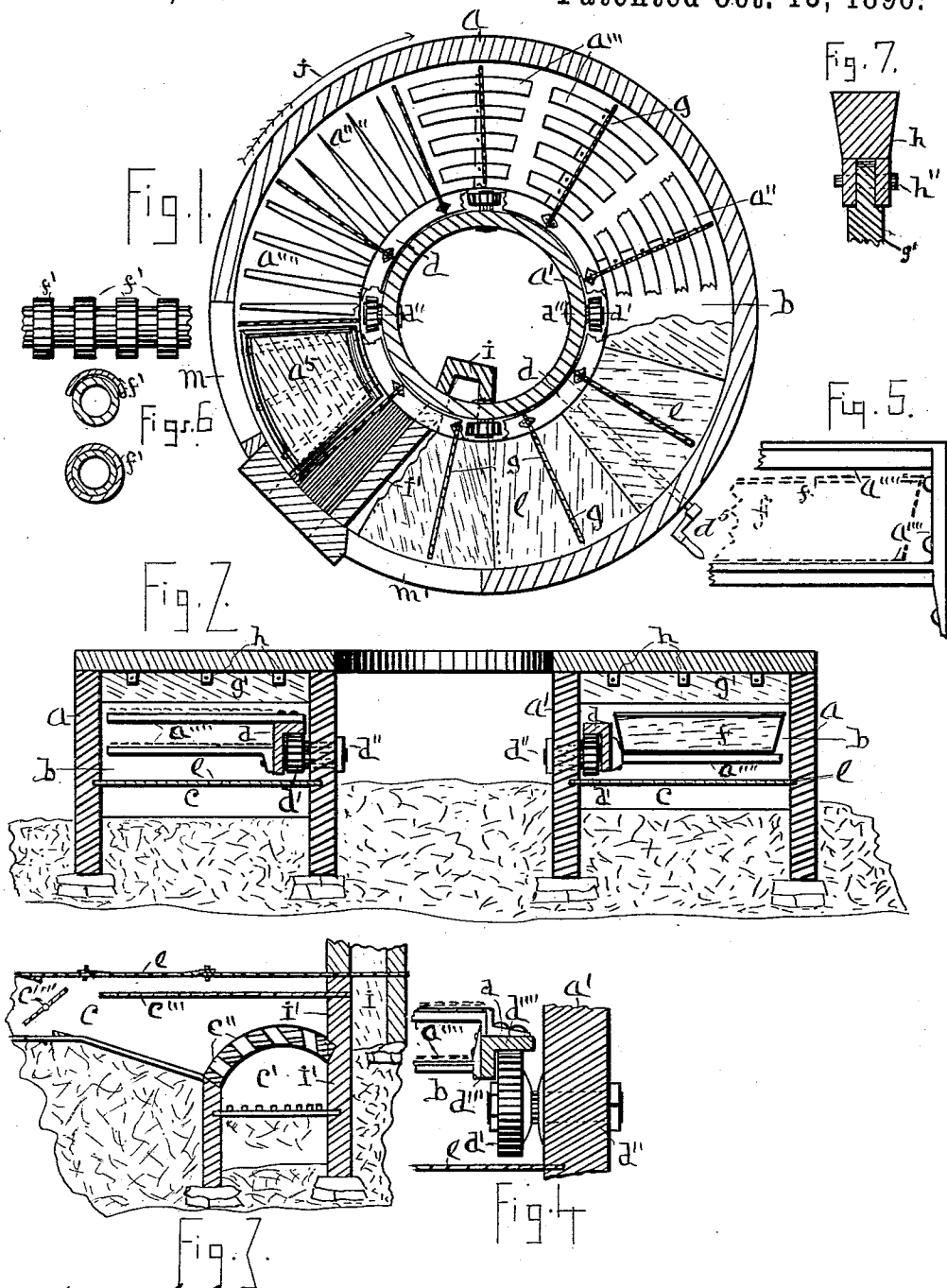


(No Model.)

J. GEORGE.
GLASS ANNEALING FURNACE.

No. 569,279.

Patented Oct. 13, 1896.



M. H. Johnson.
Jesse Johnson.

With [55]

Japhus George.

ΠΛΗΤΗΡ.

UNITED STATES PATENT OFFICE.

JAPHUS GEORGE, OF ITHACA, NEW YORK.

GLASS-ANNEALING FURNACE.

SPECIFICATION forming part of Letters Patent No. 569,279, dated October 13, 1896.

Application filed June 6, 1895. Serial No. 551,878. (No model.)

To all whom it may concern:

Be it known that I, JAPHUS GEORGE, a citizen of the United States of America, and a resident of Ithaca, Tompkins county, New York, have invented an Improved Glass-Annealing Furnace, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to the annealing of hollow ware plate and sheet glass; and its principal feature is an annular-shaped metallic-roofed flue located beneath the glass-annealing beds, from which flue the heat furnished by fuel combustion radiates upward to the annealing-beds above it, and to this flue every other part of my furnace is subservient; as, for example, the suspension of the annular-shaped annealing-bed carriage, which I support on brackets projecting out from the wall of the inner drum-shaped central part of my furnace because the flue-roof is not suitable to sustain the annealing-carriage, and to allow its upper surface to be easily kept clean of broken glass, and that the wheels and rail-track on which the carriage moves may be unencumbered with broken glass that falls from the annealing-beds. These and like matters will be apparent as I describe and claim my invention.

Figure 1 is a horizontal sectional view of a circular furnace, the section being just above the annealing-beds. Fig. 2 is its perpendicular transverse section; Fig. 3, a perpendicular section of its fuel-combustion chamber and of its connection with its flue; Fig. 4, a detached transverse sectional elevation of a portion of the glass-carriage supported by its barbed rim and of one of the brackets and of one of the wheels on which the rim is mounted and rotates; Fig. 5, an enlarged view of two of the bars of the annealing-beds made in one piece of cast-iron. Fig. 6 is a detail view of pipe bed-bars faced with copper, and Fig. 7 a section of one of pintle-pieces for the attachment of the hanging mantle-walls to the roof of the furnace.

In the figures, *a* is the circular encompassing wall of the furnace, and *a'* its inner wall, with the annular-shaped annealing-chamber *b* between these two walls, and *c* is the fuel-flue beneath the annular annealing-chamber

roofed by the metallic plates *e*. To the inner wall *a'* is attached the mechanism for rotating my annular glass-annealing carriage, which consists of the brackets *d'*, wheels *d*, and the annular bar-bed rim-rail *d*, which supports the carriage above and clear of the floor of the furnace, which floor is the roof of the heating-flue.

The bars of the annealing-beds may be quite variable in their form, but are the same as those contained in the patents issued to Christopher M. Shortle and myself, dated November 21, 1892, No. 508,934, and July 23, 1895, No. 543,207, and are illustrated at *a''* as beds made of circular interspaced bars, and at *a'''* segmental bars, and at *a''''* radiating bars.

In Fig. 2 one set of the radiating bars has a hollow tray *f* on them to contain and anneal hollow ware, and at the left hand of Fig. 2 are two bar-beds, one over the other, fast to the rim *d*, for sheet or plate glass to be annealed on—not that every one of these forms of bar-beds are used in every furnace, but any one may be selected for any one furnace. Preferably the bars of the beds have copper facings, or facings, as of aluminium or composition, which in hardness are approximately near to copper, thus making surfaces suitable for glass to rest on. To the rim *d*, between the bed-spaces, are attached upward-projecting division-walls *g*, and, corresponding with them, mantle-walls *g'* are suspended from the roof of the furnace by pintle-pieces *h*, which, as illustrated in Fig. 7, have mortises, tenons, and pieces *h''*, which hold the walls to the furnace-roof, these parts being made of any one of the well-known artificial-stone compositions used in glass-furnaces, and hanging mantle-walls being for the regulation of heat.

A cut-off wall *i* makes one side of the fuel-combustion chamber *c'*, the upper part of this wall extending up to the roof-plate *e* of the flue above it, and forces the current in the flue in the direction of the arrow *d*. The rim *d* and the annealing-beds can rotate in either direction, to suit the nature of the glass manufactured; as, for example, "chipped" glass and ornamental glass, which may require a partial or wholly reversed rotation.

The fuel-combustion chamber is arched,

and has apertures c'' , which open into the flue c , as indicated in Fig. 3, which flue gradually lessens in height to its exit end or chimney i . The usual entrance for the glass is at m and its exit out of the furnace at m' ; but in certain forms of glass it may be desirable to reverse the entrance and the exit. As shown, I use the usual crank d^5 , shaft, and cogs on the under side of the rim d to rotate the carriage.

Everything else is believed to be apparent. What I claim is—

1. In an annular annealing-furnace, having an annular annealing-chamber, and an annular annealing-carriage; the annular-shaped flue, in which the products of fuel combustion are conveyed about the circuit of the furnace, located beneath the annealing-chamber, and whose roof makes the floor of the annealing-chamber; the flue being separated therefrom by its metallic roof, through which roof its heat radiates up to and anneals the glass, while the glass is conveyed about the annealing-chamber, as set forth.
2. The described annular flue, beneath the described annular annealing-chamber, roofed by metallic plates; in combination with the described glass-annealing carriage, whose rim d is supported on brackets, which project horizontally outward from the inner central wall of the furnace; and on which brackets

the carriage, by its rim, rotates, the wheels being journaled, on the brackets, as set forth.

3. In the described glass-annealing furnace provided with a rotating glass-annealing carriage; the combination of the hanging walls g' the mortised pintle-pieces h , inserted into the roof of the furnace, for the attachment of the hanging walls g' , and the pins h'' , by which several parts the mantle-walls g' are held to the roof, as set forth.

4. In the described annealing-furnace, provided with an annular annealing-chamber, and with an annular annealing-carriage; the angular-shaped rim d ; its horizontal portion furnishing on the under side the rail-track surface, for the wheels d' ; and its perpendicular portion the surface to which the brackets are attached; in combination with the wheels d' on the brackets d'' , on which the carriage rotates, as set forth.

5. In the described glass-annealing furnace, provided with an annular glass-annealing chamber, beneath whose floor is located the annular flue c , the arched fuel-chamber c' provided with the heat-equalizing apertures c'' ; in combination with the heat-equalizing plate c''' , as set forth.

JAPHUS GEORGE.

Witnesses:

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