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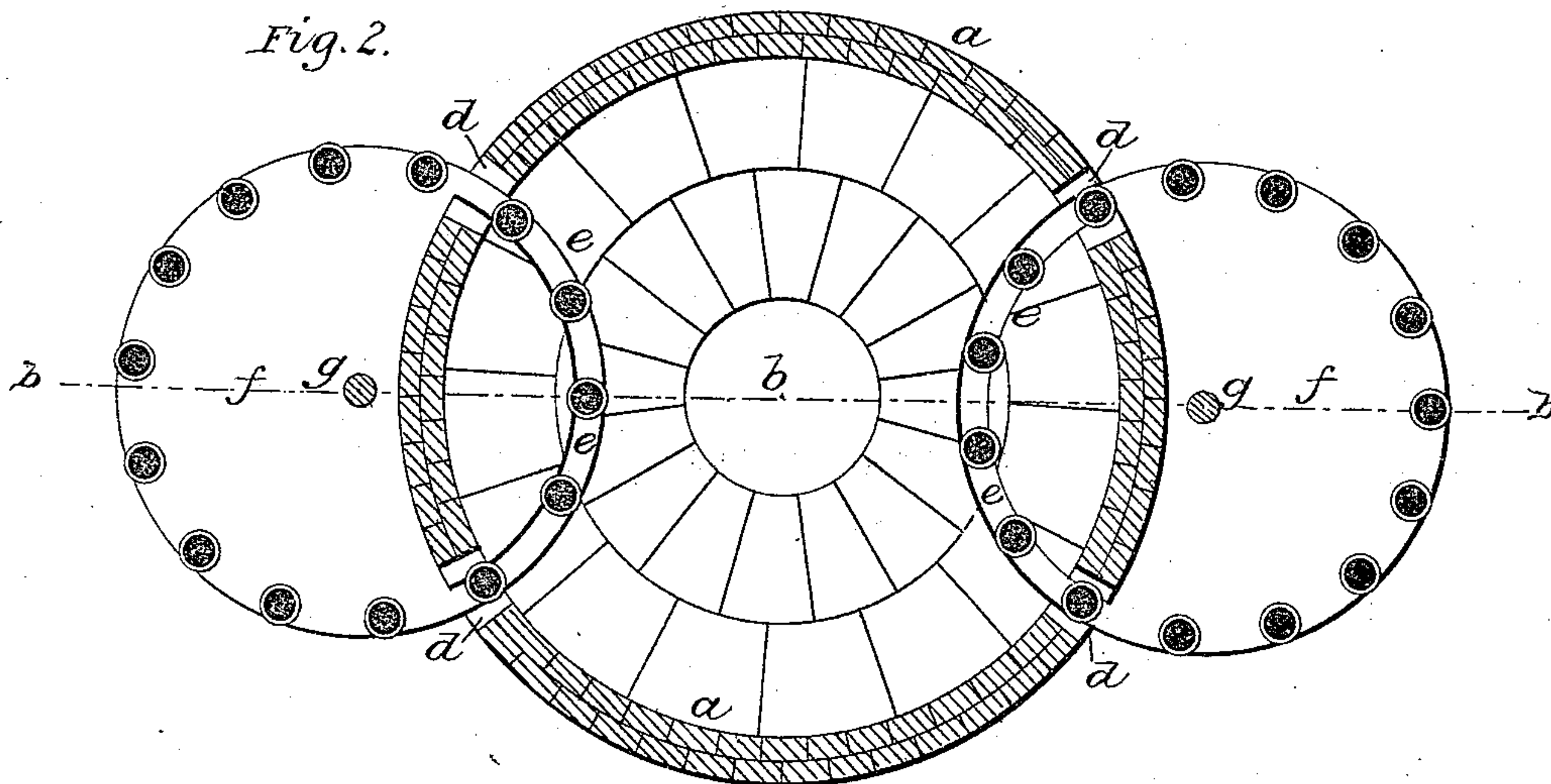
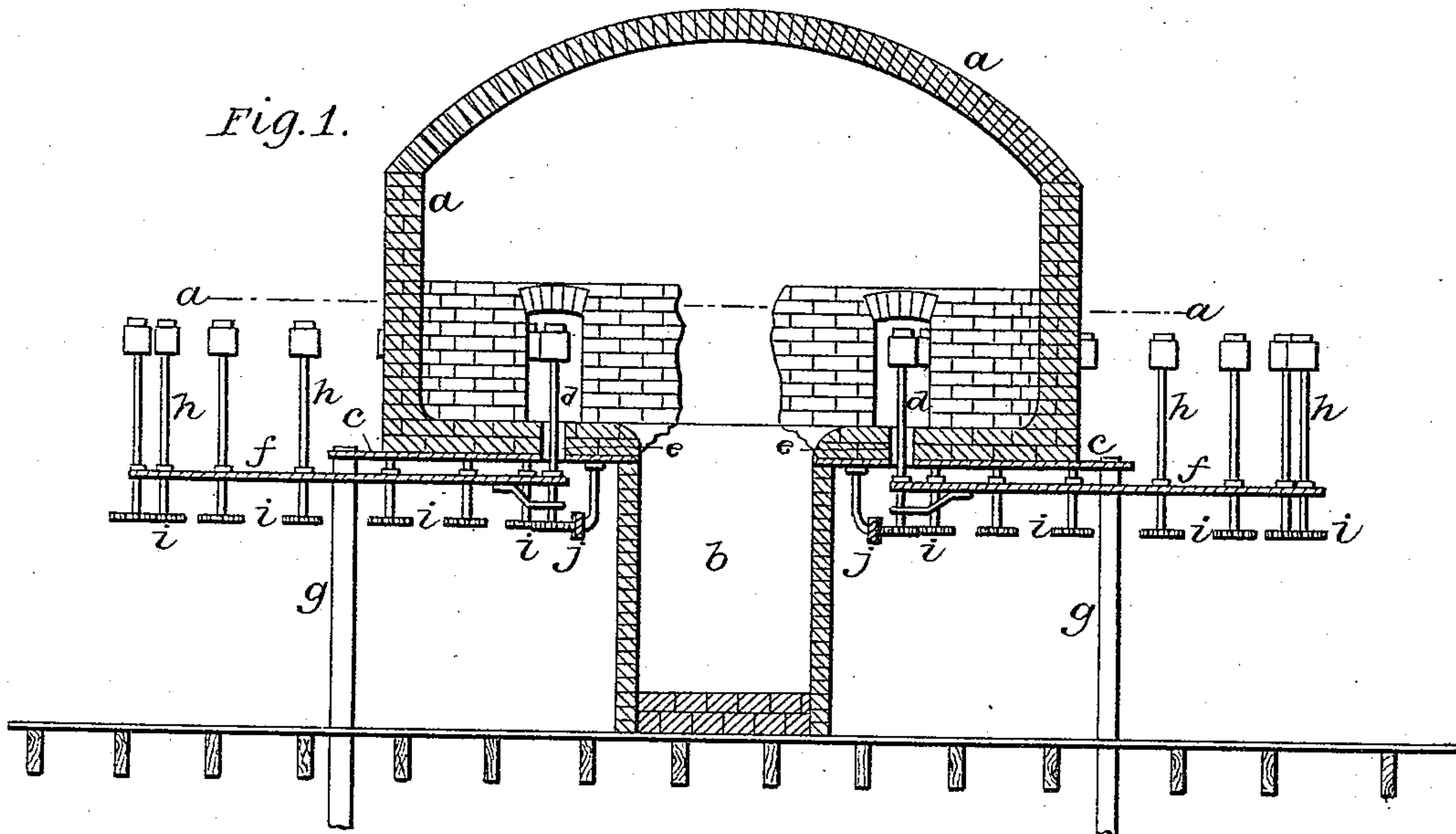
2 Sheets—Sheet 1.

M. R. CALDWELL.

APPARATUS FOR REHEATING AND FINISHING GLASSWARE.

No. 442,855.

Patented Dec. 16, 1890.



WITNESSES:

Wm. Norton
Howell Battle

INVENTOR

Matthew R. Caldwell
BY *John S. Johnson*
his ATTORNEYS.

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2 Sheets—Sheet 2.

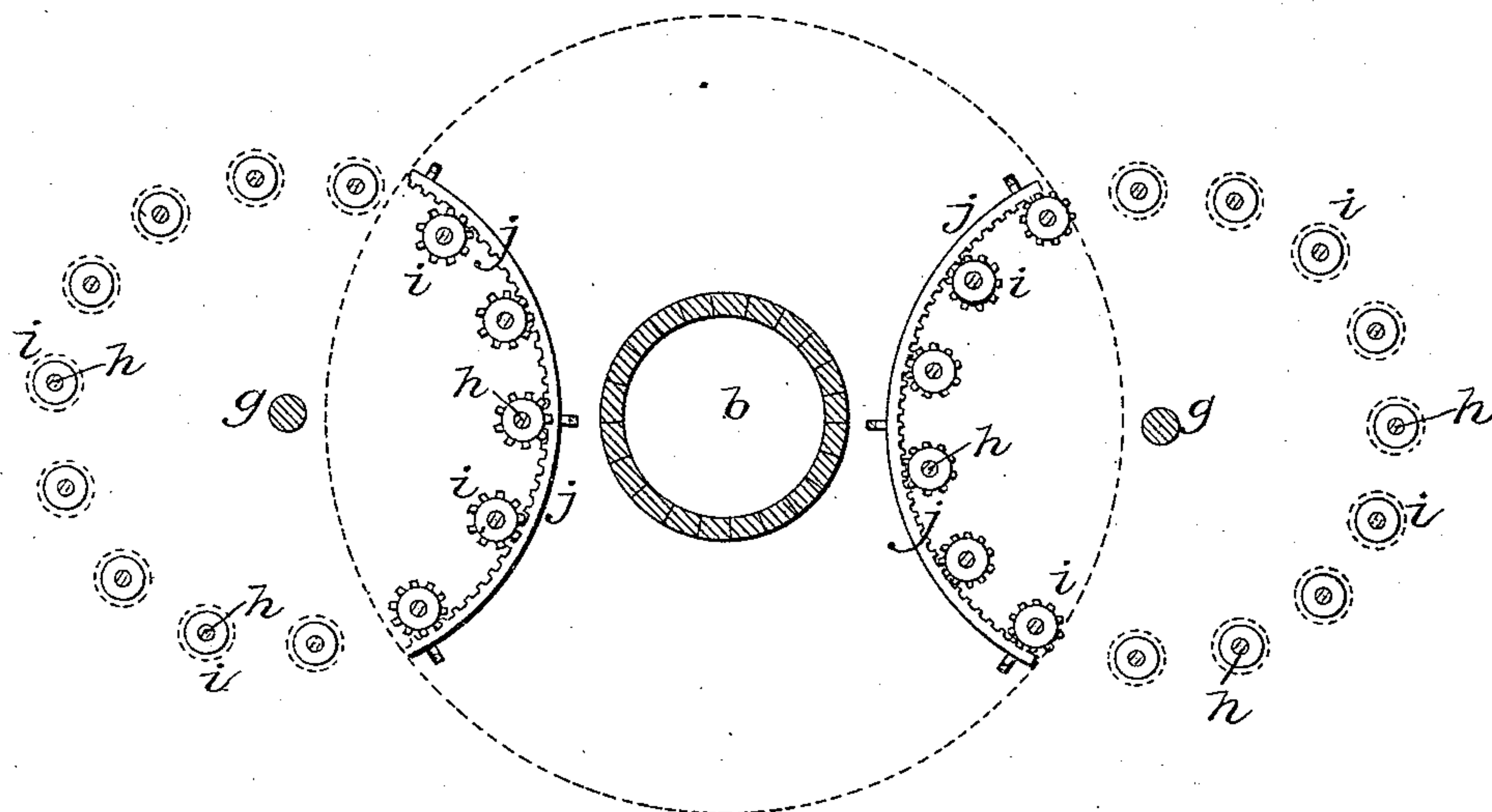
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Fig. 3.



WITNESSES:

Wm. H. Norton
Howell Bartle

INVENTOR

Matthew R. Caldwell

BY

Johnson & Johnson
ATTORNEYS.

UNITED STATES PATENT OFFICE.

MATHEW R. CALDWELL, OF TIFFIN, OHIO, ASSIGNOR TO A. J. BEATTY & SONS, OF SAME PLACE.

APPARATUS FOR REHEATING AND FINISHING GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 442,855, dated December 16, 1890.

Application filed July 26, 1890. Serial No. 360,050. (No model.)

To all whom it may concern:

Be it known that I, MATHEW R. CALDWELL, a citizen of the United States, residing at Tiffin, Seneca county, in the State of Ohio, have
5 invented new and useful Improvements in Apparatus for Reheating and Finishing Glassware, of which the following is a specification.

My invention is directed to improvements in glory-hole furnaces particularly designed
10 for reheating glassware for melting the edges and fire-polishing the surface of such articles as tumblers, goblets, and other ware pressed or blown which have their edges left rough and irregular and require to be melted and softened
15 down and rounded uniformly by revolving the article upon a snap rod or spindle under the action of the flame; and the objects of my improvements are to fire polish and finish the edges and surface of the ware uniformly by
20 subjecting it to heat while under two simultaneous motions, one sweeping horizontally through the fire-chamber where the heat is most effective and the other a motion of rotation during its passage through the fire,
25 and to render the work expeditious as a preparatory step to further work in an annealing-oven; and my said invention consists of certain novel parts and combinations of parts, whereby the article is caused to have
30 a compound motion while under the direct action of the heat, and which will be particularly pointed out in the claims concluding this specification, in connection with the accompanying drawings, wherein—

35 Figure 1 is a central vertical sectional view on the line *b b* of Fig. 2. Fig. 2 is a horizontal section of the furnace, taken on the line *a a* of Fig. 1, showing the arrangement of the ware-carrying tables on each side of the fire-chamber to obtain the most effective heat
40 upon the revolving edges of the article; and Fig. 3 is a horizontal section taken below the base-plate to show the segmental racks and the snap spindle pinions engaging therewith.

45 The furnace *a* is constructed of refractory brick, preferably of circular form, with a central circular fire-box *b* standing below the bench or base-plate *c*, upon which the fire-chamber forming-wall *a* is erected with an
50 arched crown. At opposite sides the vertical

walls of the fire-chamber are pierced with two vertically-standing openings *d d* just above the bench or base-plate, and which extend down to and open into segmental slot-formed openings *e* in the said base-plate, extending
55 therein from one wall-opening to the other, so as to form a segmental open path in the base-plate within the fire-chamber on each side of the central fire-box.

Immediately below the base-plate, and at
60 points centrally between the wall-openings *d d* on each side of the furnace, I mount a horizontal revolving table *f f* on suitably-supported vertical shafts *g g*, so as to bring the circumference of the tables in coincident re-
65 lation to and just under the segmental slot-formed openings in the base-plate. Around the table, near its edge, are mounted in suitable bearings snap rods or spindles *h*, standing upward at suitable distances apart, and having
70 cups or plugs on their upper ends for receiving and carrying the articles to be fire-finished, and which as the table is rotated carry the ware through the fire-chamber in the arc of a circle struck from the axis of the table. At
75 their lower ends the snap-spindles are provided with a pinion *i*, which engages with a segmental rack *j*, suitably secured to and depending from the under side of the base-plate or wall of the fire-box and extending paral-
80 lel with the slot-formed openings in the base-plate, so that as the snap-spindles are carried through the fire-chamber by the rotation of the table the snap-spindles are caused to rotate in their bearings while passing through
85 the fire, and thus the ware has a compound movement to obtain the best effect of the finishing action of the heat upon the edges and surface of the ware. For this purpose the ware is caused to travel in the immediate vi-
90 cinity of the greatest heat from the fire-box. This construction causes the rapid rotation of the snap-spindles only as they are slowly carried through the fire, so that after leaving the fire-chamber they have no independent
95 rotation and the ware can be readily removed from the snap-cups under the comparatively slow rotation of the table. The tables may be rotated by power applied to their shafts at their upper or at their lower ends, and it is
100

obvious that the ware may be placed within the snap-cups, carried through the furnace, and removed from the snaps during the continued rotation of the tables, and that the working capacity of the furnace may be increased by the addition of one or more tables like the two shown, and that one table only may be used. The provision for intermittently rotating each ware containing snap or plug upon a constantly-rotating table allows the ware to be carried through the fire-chamber in a continuous line and outside of the fire-chamber in a continuous line, so that the finished articles may be removed and replaced by others without stopping the tables, and this advantage is obtained by the construction and arrangement which permits the ware to enter one side of the fire-chamber, pass through it, and out at its other side, where it can be conveniently removed.

The arrangement of the ware-carrying table outside of the fire-chamber keeps it from undue heat and from warping, permits of its arrangement at the side of the furnace and of continuously carrying the ware into and out of the fire-chamber, of continuously removing the finished ware, and of continuously placing the ware to be finished. Such construction permits of the use of a comparatively small fire-chamber and of arranging two or more tables around it to increase the capacity for work, and it gives the advantage of renewing the ware-carrying supports when necessary, and of operating independent lines of ware within the same fire-chamber.

It is evident that immaterial departures may be permitted from the general construction and arrangement of parts contributing toward my invention, and for this reason I do not wish to be understood as limiting myself thereto in precise detail.

I claim as my improvement—

1. In a glass reheating or melting furnace, the combination of a fire-chamber having vertical wall-openings and coincident segmental slot-formed bottom openings extending from one wall-opening to another, a table arranged below said bottom opening and having vertically-standing spindles arranged thereon to pass through said wall and segmental bottom openings, suitable means for rotating said table continuously, and suitable means for rotating said spindles in their bearings during their passage through the fire-chamber.

2. In a glass reheating or melting furnace, the combination of a fire-chamber having vertical wall-openings and coincident segmental slot-formed bottom openings extending from one wall-opening to another, a table arranged below said bottom opening and having mounted thereon vertically-standing spindles arranged to pass into and through said wall and segmental bottom openings and provided with pinions on their lower ends, suitable means for rotating said table continuously, and a segmental rack arranged to engage said spindle-pinions to cause them to revolve in their bear-

ings only during their passage through the fire-chamber.

3. In a furnace for reheating and finishing glassware, a number of revoluble supporting-rods provided at their upper ends each with a head to receive the glass article and at their lower ends each with a pinion, in combination with a table carrying said rods, a fixed rack engaging said pinions, means for rotating said table, and a furnace through the fire-chamber whereof the said glass-supporting rods are carried.

4. In a reheating or melting furnace, the combination of a fire-chamber having vertical wall-openings and coincident segmental slot-formed bottom openings extending from one wall-opening to another and having a central fire-box, tables arranged to rotate at opposite sides of the furnace below its base-plate, having vertically-standing snaprods or spindles for carrying the ware arranged concentric with said bottom openings and having pinions on their lower ends, and segmental racks secured to the furnace, engaging said pinions and having a length equal to that of the segmental slot-formed openings, whereby the ware is caused to rotate in its passage through the fire-chamber and to be carried around outside of the same.

5. In a glass reheating or melting furnace, a fire-chamber having vertical wall-openings and coincident bottom openings extending through the fire-chamber and connecting two of said wall-openings, in combination with a table arranged beneath the bottom of the fire-chamber, having vertical ware-carrying supports arranged in the line of said openings, and means for rotating said table for carrying the ware into the fire-chamber through one wall-opening and out at the other.

6. In a furnace for reheating and finishing glassware, the combination, with the furnace having vertical wall-openings, and segmental bottom slot-formed openings extending through the fire-chamber and connecting two of said wall-openings, of a table arranged beneath the said bottom openings and having several revoluble vertical ware-carrying supports arranged to travel through said bottom slots, and means for rotating said table.

7. In a furnace for reheating and finishing glassware, the combination, with a furnace having vertical wall-openings, of several intermittently-revoluble supporting-rods, each provided with a holder for the glass article, and a continuously-revoluble table carrying said rods, whereby the ware is caused to move through the fire-chamber with a compound movement.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

MATHEW R. CALDWELL.

Witnesses:

W. F. NOBLE,
JOHN L. LOTT.