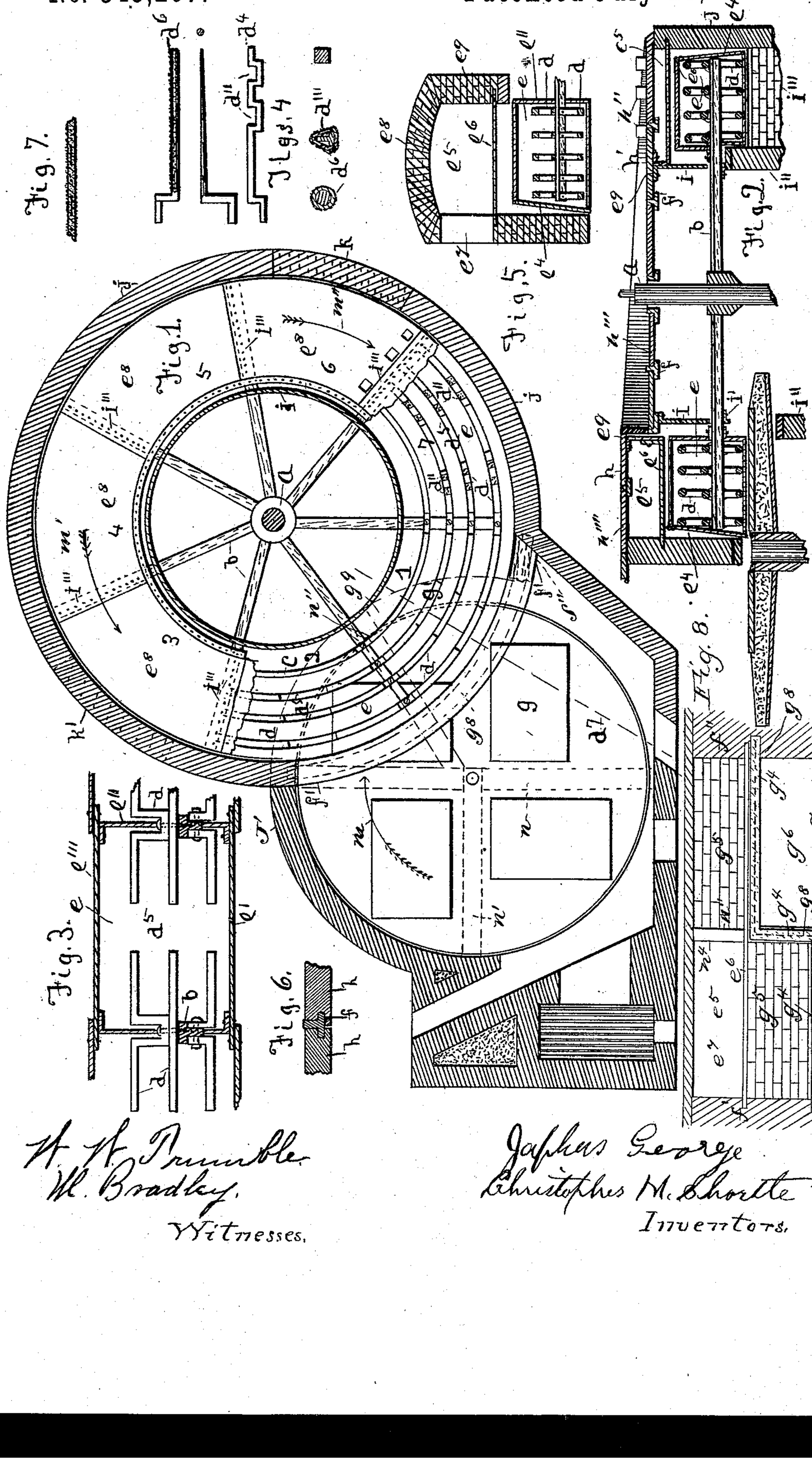
(No Model.)

J. GEORGE & C. M. SHORTLE.

GLASS ANNEALING FURNACE.

No. 543,207. Patented July 23, 1895.



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JAPHUS GEORGE AND CHRISTOPHER MICHAEL SHORTLE, OF ITHACA, NEW YORK.

GLASS-ANNEALING FURNACE.

SPECIFICATION forming part of Letters Patent No. 543,207, dated July 23, 1895.

Application filed June 11, 1892. Serial No. 436,410. (No model.)

To all whom it may concern:

Be it known that we, JAPHUS GEORGE and CHRISTOPHER MICHAEL SHORTLE, citizens of the United States of America, and residents of Ithaca, Tompkins county, and State of New York, have invented an Improved Glass-Annealing Furnace, of which the following is a specification, reference being had to the accompanying drawings.

Our invention is supplementary to our Patent No. 508,934 of November 21, 1893, and relates to a flue over our annealing-wheel, the bar-beds, boxing about the bar-beds, and other like matters, which will be apparent as we illustrate, describe, and claim them.

Figure 1 is a horizontal sectional ground plan of our furnace, the right-hand portion of the plane of section being above the roof of the flue and below the annealing-chamber roof. Fig. 2 is a sectional elevation by a line just in front of the shafts of the flattening and annealing wheels. Fig. 3 is a longitudinal sectional elevation of one of the boxings and bar-beds. Fig. 4 are forms of the bars. Fig. 5 is a transverse sectional elevation of our flue. Fig. 6 is a view of a roof-girder concealed in the joints of our roofing-stones. Fig. 7 is a section of our asbestos fabric with its wire-netting. Fig. 8 is an elevation of our division-wall between the flattening and annealing chambers, supported by a girder between the abutments f' f'', the abutments being in perpendicular section and the rest of the wall its flattening-chamber front, except where the mantle-wall n' abuts against it, the girder being on the curved line of the annealing-chamber wall and the view from within the flattening-chamber looking toward the annealing-chamber.

In the figures, a is the vertical shaft of our annealing-wheel, from the hub of which project the arms b, which extend outwardly to near the wall j of the wheel-chamber. The arms are held to each other by a circular bar c, and exterior to that bar are the circular bed-bars d, bolted to the arms, on which the sheets of glass are annealed. These bars may be whole circles, in which case the flattener's fork is withdrawn from beneath the sheets of glass when on the beds in a manner the reverse of that in which it was inserted beneath the sheets; or the bars may have depressed portions d'', Fig. 4, into which the tines of the flattener's fork are lowered while being withdrawn; or the bars may be segments of circles, as illustrated in Fig. 3, with open spaces d^5 between their ends for the flattener's fork. There may be more than one bed of bars fast to the arms, one over the other, as the three shown in Fig. 3, where the middle bars are straight, the upper ones bent by angles upward and the lower bent by angles downward.

To prevent the settling of dust and products of combustion of fuel on the glass we put a boxing about each bed-section e, composed of the floor e', ends e'', sides, and lid e^4, which lid is hung inclined that its weight may keep it shut; and, further, to keep the dust and other products of combustion of fuel off of the glass while being annealed we construct a flue e^5 over the glass beds and the boxing when used. This flue may be made of brick, supported on girders, with a thin metallic floor e^6, as indicated in Fig. 5; or the floor may be made of asbestos fabric, such as is indicated in Fig. 7. This flue is close to the inclosing wall of the annealing-wheel and at one side of the flue, and its top may be part of the wall j and of the roof of the chamber. The inner wall e^9 may be made of metal, as can be the whole flue. Through its floor the heat passes to the sheets of glass below. The mouth of the flue is large, but decreases in size from h to h', where it reaches the escape-apertures h''.

To facilitate the use of our flue e^5 a division-wall is placed above the lapping of the annealing-wheel, over the flattening-wheel, a part or the whole of the distance between the abutments f' f'', which wall has the essential parts g^6, the aperture through which the sheets of glass are transferred from the flattening-stones, when at g, to the bar-beds, when at g', the flue entrance e^7, and the supporting-girder g^4. When the wheel revolves to the left the glass is taken out of the annealing-chamber at k, and when to the right at k'.

The roof of our annealing-chamber may be

made of a brick arch, or can be made, as indicated in Fig. 2, of flat stones h''', supported by girders.

That the heat may be confined to the circumferential portion of the annealing-wheel a stationary hanging wall i is suspended from the roof of the annealing-chamber, and a wall i' fast to the wheel just under the wall i, and beneath that the stationary wall i'', with the transverse walls i''' at intervals about the circumference of the annealing-chamber between the walls i'' and j.

Everything else is believed to be apparent.

What we claim is—

1. In the described annealing furnace and chamber, the described annealing wheel; constructed of a vertical shaft, a central hub, radial arms, extending horizontally outward to near the inclosing wall of the chamber, and a series of circular circumferential interspaced bars, attached to the outer portions of the arms, as set forth.

2. In the described annealing wheel, and chamber, the bed sections with intervals between them, composed of segments of circular bars, fast to the outer ends of the arms of the wheel; the division of the bars into sections being for the purpose of the introduction and withdrawal of the flattener's fork, as set forth.

3. In the described annealing chamber, the three heat confining walls i, i', i'', situated one over the other and co-operating with each other; the wall i being fast to the roof of the annealing chamber, and extending down to the inner edge of the beds of the wheel; the wall i' being fast to the wheel, next to the annealing beds, and revolving with it; and the wall i'' based on the ground and extending up to the wall i', as set forth.

4. In combination with the described annealing wheel, in its chamber, with beds of bars, on which the sheets of glass are annealed; the boxing constructed of sheet metal, about and inclosing each bed space; fast to and revolving with the wheel, as set forth.

5. In the described glass flattening and annealing furnace, the division wall, constructed between the flattening and annealing chambers, supported by the girder g^4 spanning the space between, and supported by the abutments f', f''; the wall being provided with the aperture e^7, which opens into the flue e^5, in the upper part of the annealing chamber; and with an aperture g^6, through which the sheets of glass are transferred from the flattening wheel and chamber, to the annealing chamber and beds; the wall being adapted to cause the products of the combustion of fuel to enter the flue e^5, as set forth.

6. In combination, and as a part of the described annealing wheel, the transverse, metallic, mantle walls, placed over, and fast to, and revolving with the beds of bars of the annealing wheel, in the intervals between the beds of bars; whereby the heated air is confined, and conveyed about the chamber, with the sheets of glass while cooling, as set forth.

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