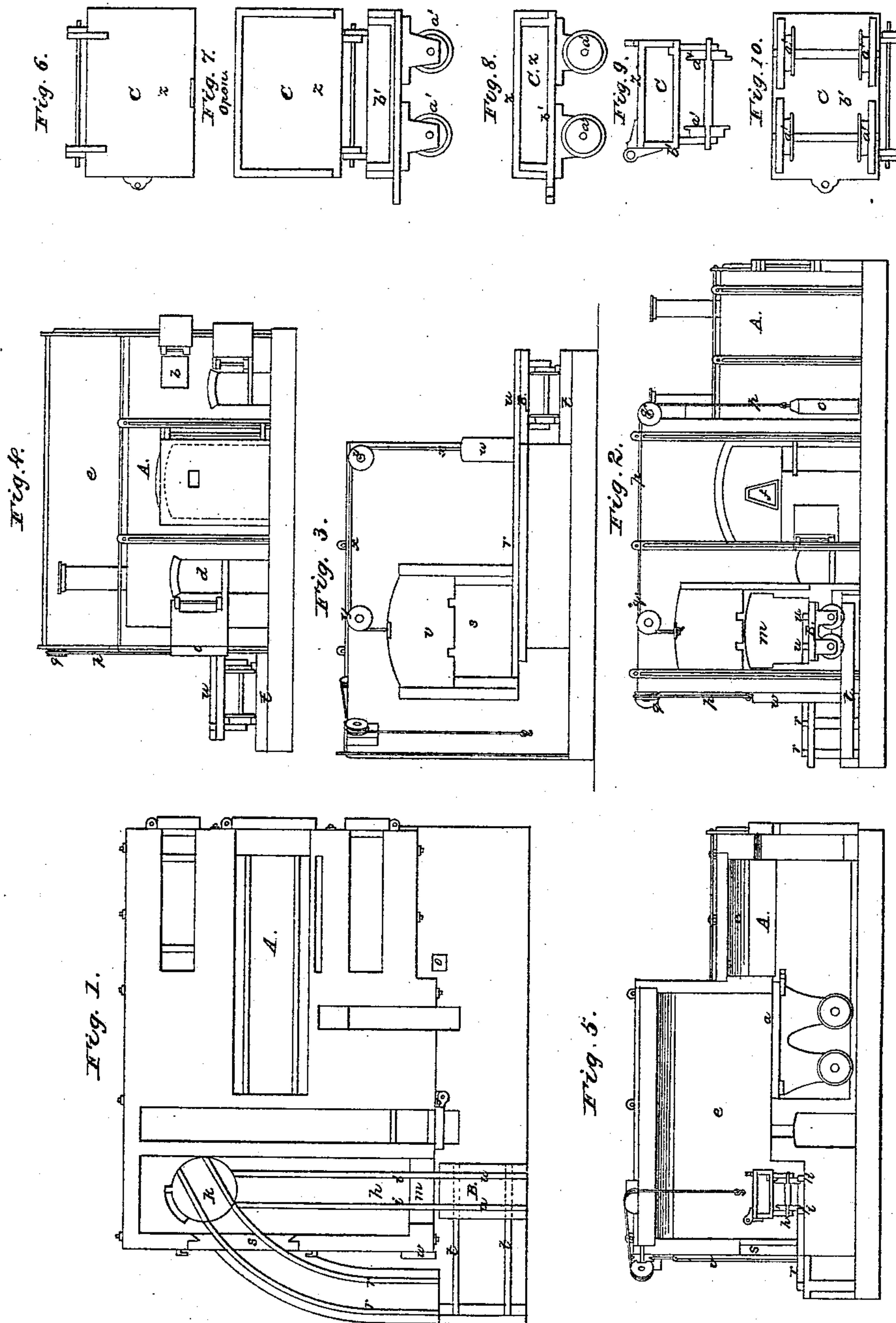


Neale & Amode, Glass Furnace.

N^o 64,244.

Patented Apr. 30, 1867.



Witnesses:
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GEORGE F. NEALE AND LOUIS AMEDE, OF SOUTH BOSTON, MASSACHUSETTS.

Letters Patent No. 64,244, dated April 30, 1867.

IMPROVED GLASS-ANNEALING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that we, GEORGE F. NEALE and LOUIS AMEDE, of South Boston, of the county of Suffolk, and State of Massachusetts, have made a new and useful invention having reference to the Annealing of Sheets or Plates of Glass; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a horizontal section of a window-glass flattening furnace provided with our appliances for annealing the glass.

Figure 2 is a side elevation.

Figures 3 and 4 end elevations; and

Figure 5 a longitudinal and vertical section of such furnace and its accessories.

In carrying out our invention we combine with the flattening furnace a series of boxes, and means of enabling such boxes in succession to be inserted into and removed from the annealing chamber of the furnace. Each of the boxes consists of a metallic case made of the proper size to receive a pile or several sheets of the flattened glass, and provided with a cover to close it. Each of such boxes we furnish with wheels, like those of a railway carriage, the same being so that the box may be run along on a railway track, which we so combine and arrange with the annealing chamber of the furnace as to enable the several boxes to be moved into and out of the said chamber, as occasion may require.

In the drawings A denotes the flattening furnace as provided in the ordinary manner with a movable flattening stone or table, *a a*, cylinder-heating oven *b*, and a reverberatory arch or flattening chamber, *c*, whose fire-place is shown at *d*. The stone or table *a* is mounted on wheels in the usual manner, so that it may be run from the flattening chamber *c* into the annealing chamber *e*, or from the latter into the former, as occasion may require. The annealing chamber is to be provided, as is customary, with the necessary fire-places, or means of heating it, and also with an opening, *f*, in one side, to enable a workman to thrust a rod, tongs, or other implement into the annealing chamber for the purpose of transferring a glass plate from the table to a box. At the back part of the annealing chamber there is a sunken place, *h*, on whose floor a railway track, *i i*, is laid, such track being made to terminate at its inner end against a turn-table, *k*, while at its other end it stops at a doorway, *m*, made through the side of the furnace, and so as to open out of one end of the space *h*. This doorway should be provided with a sliding shutter or door, *n*, balanced by a weight, *o*, appended to a chain, *p*, going over two grooved wheels *q q*. From the turn-table another railway track *r r* extends through another doorway *s* leading out of the rear end of the annealing chamber. After running alongside of the furnace, or, in other respects, a sufficient distance, the track *r r* terminates close to and above another track *t t* which extends toward the outer end of the first track *i i*, the whole being so that a truck or carriage, B, placed on the said track *t t*, and having track-rails *u u* on its upper surface and on a level with the rails of the tracks *i i*, and *r r*, may be moved from either of these latter tracks to the other, and so as to bring the track rails *u u* into line therewith. The opening *s* should be furnished with a door, *v*, which may be balanced by a weight, *w*, attached to a chain, *x*, going about two pulleys *y y*.

Figure 6 is a top view.

Figure 7, a front elevation.

Figure 8, a longitudinal section.

Figure 9, a transverse section; and

Figure 10, an under side view of one of the carriage boxes or cases C, used in connection with the railway tracks and the annealing chamber.

This box is a small wagon, provided with wheels *a' a' a' a'*, and with a cover, *z*, which is hinged to the body *b'*, and made so as when shut to closely fit it.

The following is a description of the mode of procedure which we adopt with the above-described means in order to flatten glass cylinders and to anneal them.

The cylinders, after having been heated, cut, and flattened in the usual manner on the flattening table, are not, as heretofore, to be piled on or arranged on a carriage and run through a "lear" or long annealing furnace but each is to be placed flatwise into one of the boxes, which should be capable of holding about thirty of the

sheets. After a sufficient pile or number of the sheets may have been so deposited within the box its lid or cover should be closed, in order that cold air may be prevented from direct access to the plates. The box is next to be run out of the chamber on the emerging track, and another box, previously introduced into the chamber by the interior track and suffered to remain therein until it may have become sufficiently heated, should be moved upon the turn-table and be supplied with sheets of the glass. Five of these boxes will generally be sufficient for a furnace, although we do not confine our invention to such number. Preparatory to the discharge of each box from the furnace the several boxes on the outer railway track are to be moved along thereon a suitable distance to enable the said box to pass entirely out of the furnace. Each box on leaving the outside track *r r* will be received on the truck-carriage B, and by it should afterward be moved up to the interior track *i i* and be transferred thereto. During the passage of each box along the exterior railway, such will cool gradually and sufficiently to enable its contents or glass plates to be removed from it in an annealed state, they being taken from it before again introducing it into the furnace. In practice it is customary to allow each box while the furnace is in operation to remain out of it about four or five hours in order that the box with its contents may properly cool. On removal of the glass from the box it will be found that the reduction of temperature will have taken place so slowly that the glass will be as soft and well annealed as it usually is when suffered to remain for a week in the piling arch of an ordinary furnace, or after having been passed through a "leer." The box system of annealing enables a manufacturer to execute orders with much greater promptitude and dispatch than he can by any other of the common or well-known processes of flattening and annealing the glass cylinders. It also effects a saving of fuel and labor, a furnace with the boxes and railways enabling double the amount of glass to be annealed in a given time to what may be done with such a furnace without the boxes and railways and operating in the ordinary way. Besides, with the box system there is not so much breakage of glass, and the sheets have flat surfaces insured to them. By the box system the kiln is much less liable to derangement, it being constantly maintained in operation without any intermission for cooling the glass, as is required in other kilns, in which the interruption is as often as much as three days at a time, after which the furnace or kiln has to be heated up again to the working temperature. This constant heating and cooling is productive of bad effects on the brick-work of the furnace.

We are aware that small articles of glassware have been annealed in boxes made of wood, or other material, and therefore do not claim this.

What we claim as our invention is as follows:

We claim the combination of the railway and the system of carriage boxes with the flattening furnaces, such railway being so arranged as to enable the said annealing carriages or boxes to be run into and out of the said furnace, and to rest while on that part of the railway which is without it, substantially as specified.

We also claim for the purpose described, the combination and arrangement of the interior track *i i*, the turn-table *k*, or its equivalent, the two exterior tracks *r r* and *t t*, and the transferring carriage B provided with a track, *u u*, as specified.

We also claim the combination and arrangement of the sunken space *h*, with the furnace and railway constructed and arranged substantially as described.

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Witnesses:

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