

No. 750,899.

PATENTED FEB. 2, 1904.

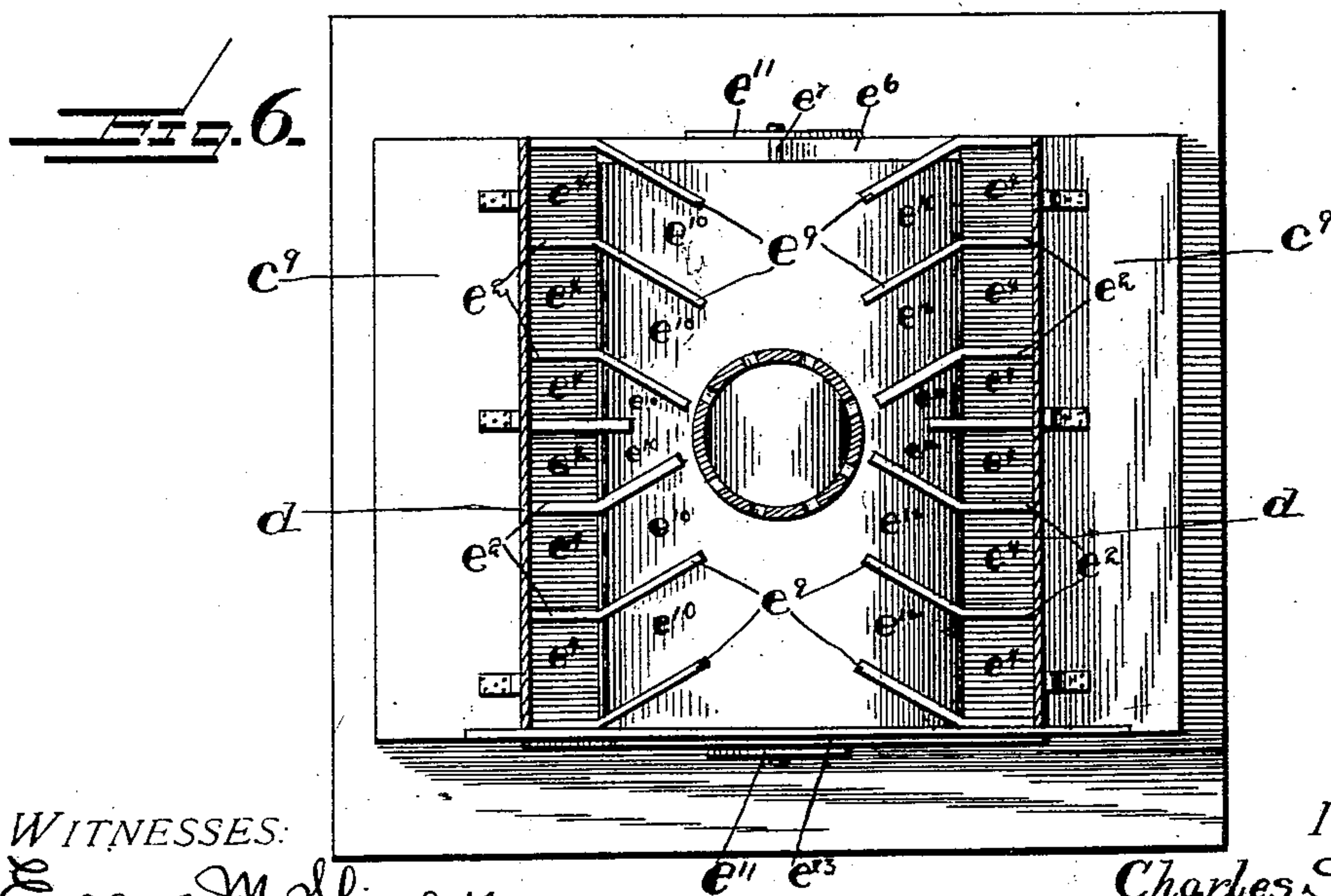
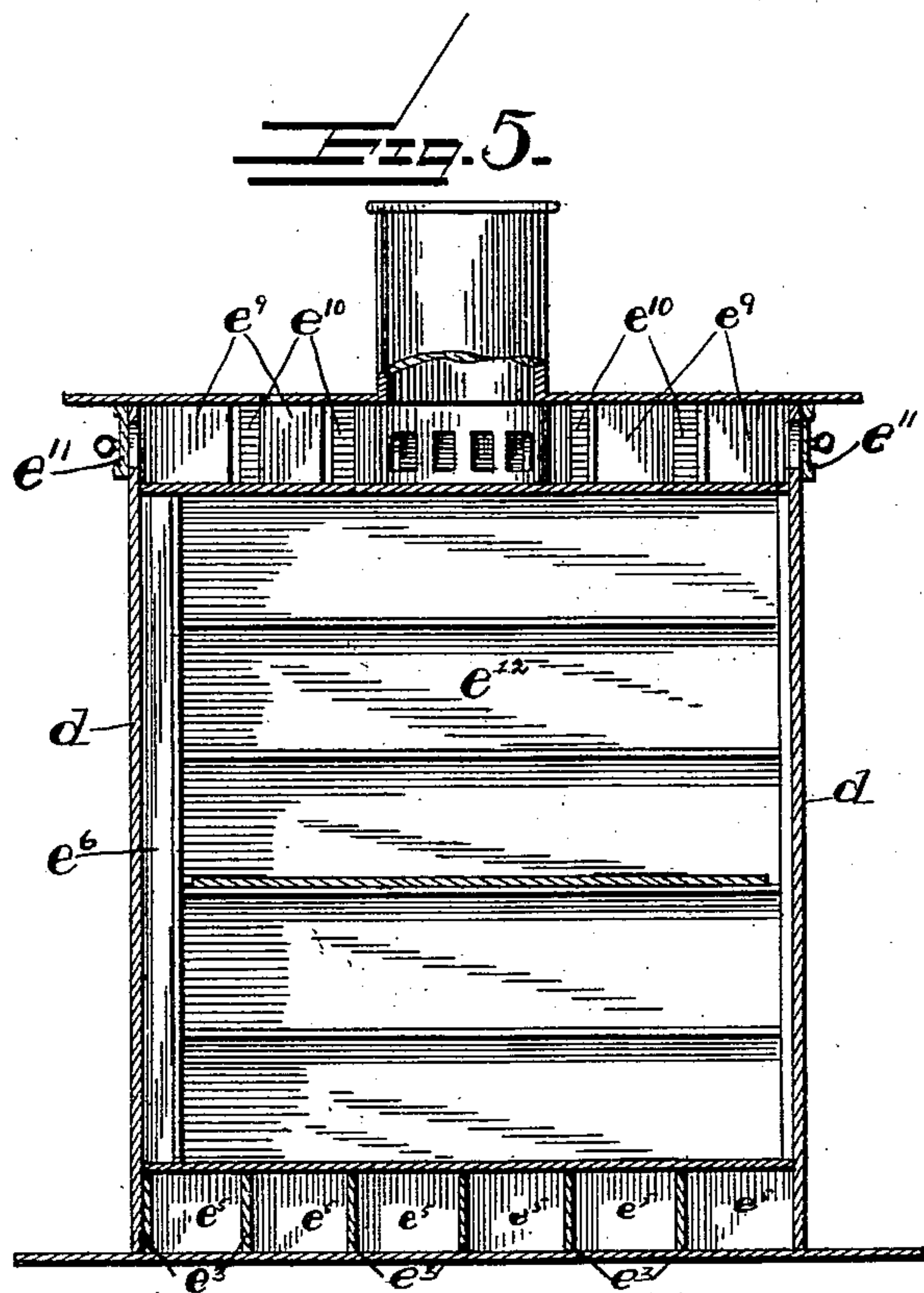
C. SCHWEIZER.

KILN.

APPLICATION FILED JULY 9, 1901.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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KILN.

SPECIFICATION forming part of Letters Patent No. 750,899, dated February 2, 1904.

Application filed July 9, 1901. Serial No. 67,687. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SCHWEIZER, a citizen of the United States, residing at Maplewood, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Kilns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
 10 pertains to make and use the same.

This invention consists in a kiln or oven which may be brought rapidly to a maximum of heat with a minimum quantity of fuel under utilization of practically all the heat generated and be rapidly cooled and in which the heat will be evenly distributed, whereby arti-
 15 cles farthest from the source of heat will be as well baked as those nearest thereto, all as hereinafter more specifically set forth.

In the accompanying drawings, forming part of this specification, and in which like letters of reference designate like parts, Figure 1 is a view in perspective, showing my preferred grate-bar, exhibiting its hollow form
 25 and lateral perforations. Fig. 2 is a view in perspective, showing grate-bars assembled in a frame to constitute a grate, exhibiting the air or draft spaces formed between the bars on their assemblage, into which the lateral per-
 30 forations open. Fig. 3 is a view in central vertical lateral section, showing the general interior appearance of the kiln looking from front to rear, exhibiting the furnaces opening into flues along the sides and bottom of the
 35 oven proper, which has shelves or compartments, the side flues opening at its top, where deflectors from them distribute the hot products of combustion over the whole top on their way to the chimney at the middle and in dot-
 40 ted lines a vertical partition in a flue at the rear, branched to deflect the products outward. Fig. 4 is a view in horizontal section taken on the line xx of Fig. 3 and looking upward, the structure being in the same relative position
 45 in each figure, showing the arrangement of the oven proper, the flues, and the furnaces, exhibiting the furnaces in divisions, each division opening into a vertical flue against the side of the oven, connecting with a horizontal

flue across the bottom of the oven, directly
 50 opposite divisions discharging oppositely into adjacent flues, and exhibiting a door to the oven proper. Fig. 5 is a view in vertical cross—that is, anteroposterior—section, taken just
 55 to the right of the vertical partition in the rear flue, showing the interior of the structure looking in from one side, exhibiting the flues across the bottom of the oven proper, the flue at the rear, and the deflectors at the top, the
 60 oven proper provided with shelves or compartments; and Fig. 6 is a view in horizontal section of the structure, taken on the line yy of Fig. 3 and looking downward, showing the
 65 relation of parts above, exhibiting the upper ends of the vertical flues, the deflectors over the top of the oven proper, and the movable covers of the furnaces.

In many operations of a kiln, such as in decorating china or making stained glass for memorial windows, the kiln has to be heated
 70 up quickly and well and at the proper time readily have its heat stopped or be quickly cooled in order that as the colors begin to flow they may not run together.

Referring to the drawings, a indicates a hol-
 75 low or chambered open-ended laterally-perforated grate-bar of refractory material so placed and held, with others of its kind, in a suitable frame b as to leave vertical draft-
 80 spaces between the bars and permit entrance of air into their chambers at one end, the chambers communicating with the draft-spaces by the lateral perforations. The grate-bars in the frame constitute a grate. Grates of this
 85 construction are placed in furnaces c , of which one is located at each side of a casing d , set out at the sides, at the bottom, at the rear, and at the top from the oven proper, e , leaving space there from the upper part of which
 90 the chimney leads, each furnace being in several divisions, with a grate for each division. Taking each division as an independent stove, it has a combustion-chamber c^2 , having a slide-controlled draft-opening c^3 in the fuel-
 95 door above the grate and an exit-opening c^4 below the grate, these for downdraft, and may have also a slide-controlled draft-opening c^5 at the grate and a slide-controlled exit-open-

ing c^6 above the grate, these for updraft, and also have an ash-dump c^7 into a door-provided ash-pit, and be provided with an oil-feed c^8 for liquid fuel. The combustion-chambers
 5 have hinged covers c^9 for ready access and to be able quickly to cool down. This device gives complete combustion and very high heat and may be rapidly cooled.

The space between the casing and the oven
 10 at the sides and bottom is divided, respectively, by partitions e^2 and e^3 into respective flues e^4 and e^5 , vertical along the sides and horizontal across the bottom, each cross-flue e^5 on the bottom of the oven opening at each
 15 end into a vertical flue e^4 on a side of the oven, each cross-flue, with a vertical flue at each end, forming one continuous passage. Each furnace-division opens into—that is, discharges its hot products of combustion into—
 20 a vertical flue directly opposite divisions discharging oppositely into adjacent flues. Part of the hot products of combustion from a division of the furnace rise to the space at the top of the vertical flue at that division. Part
 25 are drawn down in this flue, cross the bottom of the oven by the cross-flue, and rise on the opposite side to the space at the top. As the products of combustion from each furnace strike against a wall of a furnace, they are additionally heated as they pass upward. The
 30 rear cross-flue besides connecting with its vertical flues opens into a rear flue e^6 , which has centrally a vertical partition e^7 , provided with branches e^8 at the top, the partition and
 35 branches being to spread the products of combustion and throw them outward, and thus spread the heat and direct it also to the corners at the end. Between the casing and the top of the oven are placed partitions or de-
 40 flectors e^9 , forming flues e^{10} , into which the vertical flues e^4 open, and by these deflectors or flues the hot products of combustion are deflected and brought into contact with the entire surface of the top of the oven instead
 45 of passing straight to the centrally-placed chimney. The space above the oven is provided at front and rear with ventilators e^{11} , by opening which the top of the oven may be quickly cooled. This construction insures
 50 thorough, even, and efficient distribution and application of the heat and similar cooling when desired.

The oven proper, e , is divided by partitions or shelves e^{12} into compartments to hold the
 55 ware under treatment and has a door or doors e^{13} at the front.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

60 1. A kiln for burning fire-clay goods, comprising inner and outer walls with a space between, combustion-chambers at opposite sides, each combustion-chamber opening into a vertical flue which opens at its lower end into a

horizontal flue across the bottom of the oven, 65 which horizontal flue opens into the lower end of a vertical flue against the furnace on the opposite side, whereby additional heat is given to the products of combustion as they ascend along the sides of the oven, the vertical flues 70 discharging at or above the top of the oven, all substantially as described.

2. A kiln for burning fire-clay goods, comprising inner and outer walls with a space between, combustion-chambers at opposite sides, 75 each combustion-chamber opening into a vertical flue which opens at its lower end into a horizontal flue across the bottom of the oven, which horizontal flue opens into the lower end of a vertical flue against the furnace on the 80 opposite side, whereby additional heat is given to the products of combustion as they ascend along the sides of the oven, the vertical flues discharging at or above the top of the oven, and a vertical flue at the rear with which the 85 rear horizontal flue communicates, all substantially as described.

3. In a kiln, the combination with an oven, of combustion-chambers, vertical flues on the sides of the oven connected with the combustion-chambers and leading therefrom, horizontal flues beneath the oven to which these 90 vertical flues lead, vertical flues opposite the vertical flues with which the combustion-chambers connect, to which the horizontal flues 95 lead, and a vertical flue at the rear of the oven containing a deflecting-partition, the vertical flues discharging at or above the top of the oven, substantially as and for the purpose described. 100

4. The combination of the furnaces, the oven, the vertical flues on the sides of the oven, and the horizontal flues on its bottom, of def- 105 flectors at the upper or discharge ends of the vertical flues, directing the heat over the top of the oven, and an exit common to all the vertical flues, substantially as set forth.

5. The combination of the furnaces, the oven, vertical flues on the sides and at the rear 110 of the oven, and the horizontal flues on its bottom, of deflectors at the upper or discharge ends of the vertical flues, directing the heat over the top of the oven, and an exit common to all the vertical flues, substantially as set 115 forth.

6. In a kiln, the combination with the oven, of furnaces arranged at opposite sides of the casing, the furnaces being provided with movable covers and connecting with vertical flues 120 at the sides of the oven, and horizontal flues at the bottom thereof, the vertical flues discharging over the top of the oven, whereby, after the kiln has been highly heated, it may readily be cooled down, substantially as described. 125

7. The combination of the furnace, the oven, vertical flues on the sides and at the rear of the oven, and horizontal flues on its bottom, de-

flectors at the upper or discharge ends of the vertical flues and arranged to direct the heat over the top of the oven, an exit common to all the vertical flues, and ventilators arranged
5 above the oven at the front and rear, whereby the top of the oven may be quickly cooled, substantially as described.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

CHARLES SCHWEIZER.

Witnesses:

ALEXANDER B. WILSON,
CALVIN S. CARTER.