(No Model.) 2 Sheets—Sheet 1.

F. M. YANNER & H. C. PFEIFFER.

PORTABLE OVEN.

No. 561,750. Patented June 9, 1896.

Fig 1.

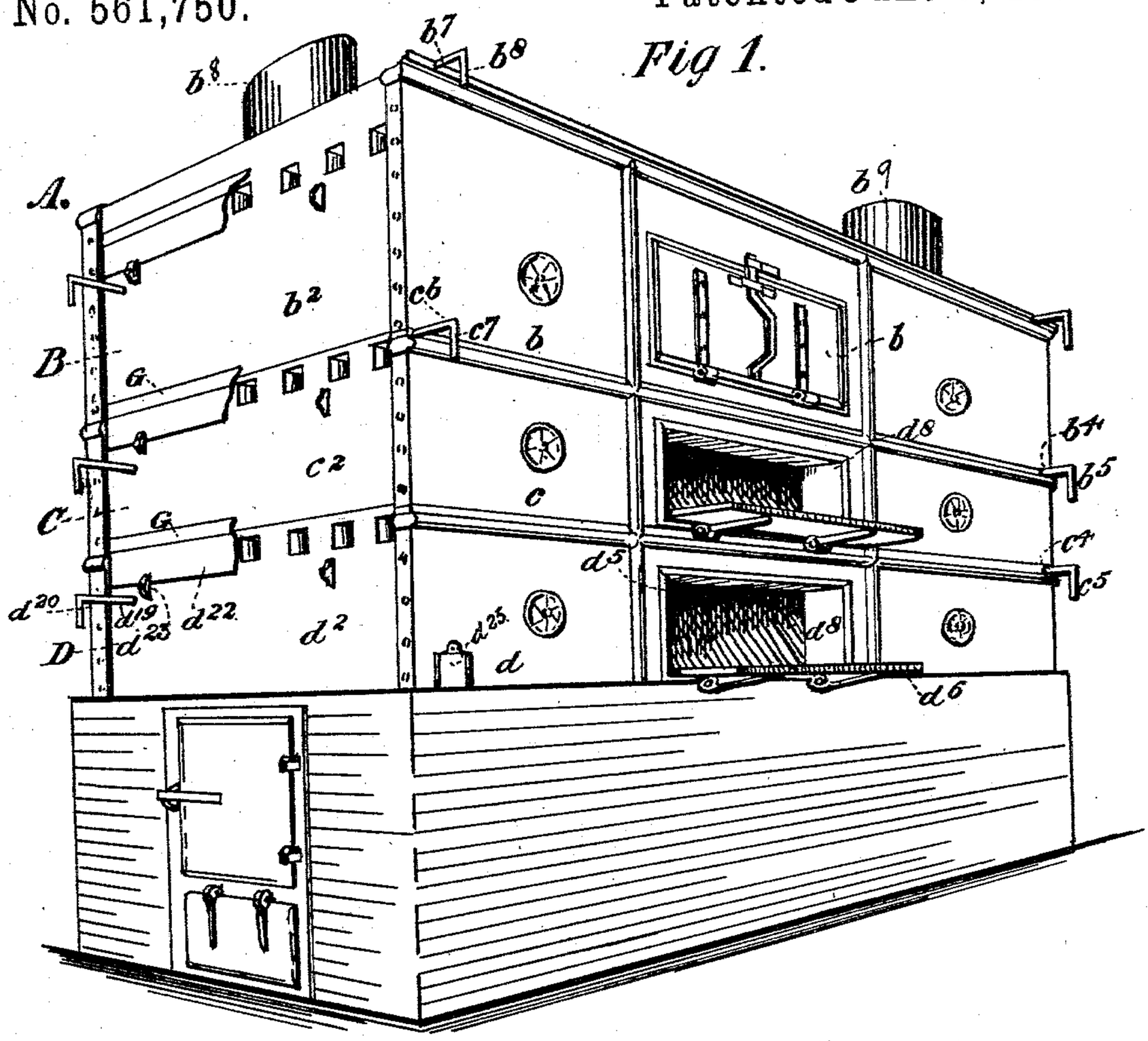

Fig 4

Fig. 5.

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Fig 2

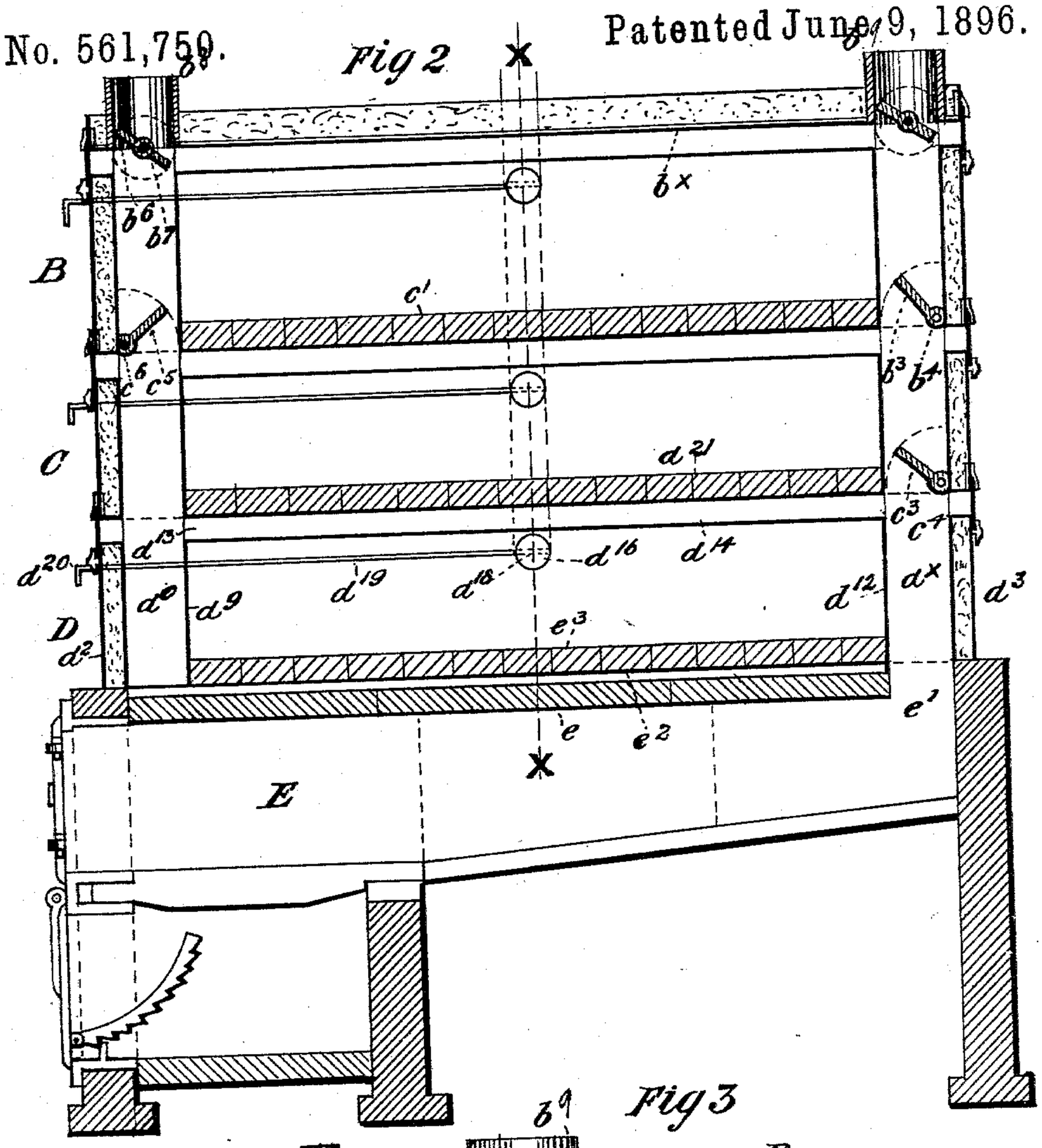
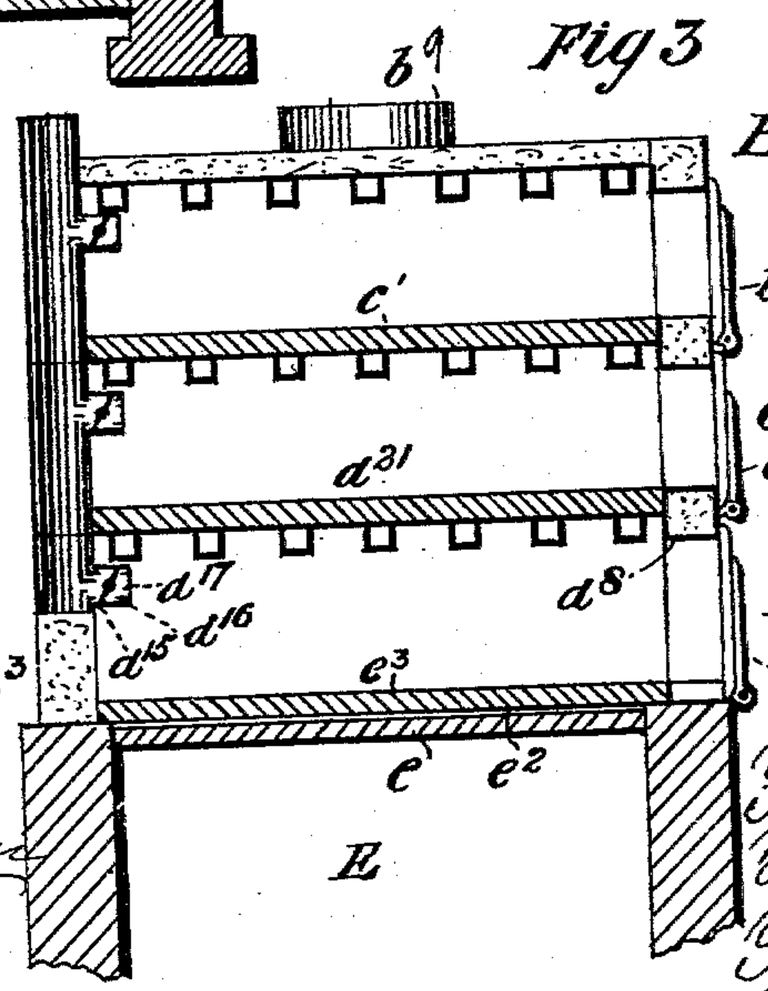


Fig 3



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PORTABLE OVEN.

SPECIFICATION forming part of Letters Patent No. 561,750, dated June 9, 1896.

Application filed September 16, 1895. Serial No. 562,734. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK M. YANNER and HENRY C. PFEIFFER, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Portable Ovens; and we do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of our invention is, first, to construct a portable oven in such a manner as to increase or decrease the number of heating-compartments; second, to maintain different degrees of temperature in the separate compartments; third, to increase the heating-surfaces supporting the floor of each compartment; fourth, to facilitate the escape of heat, smoke, and odors from each compartment; fifth, to prevent the escape of the heat at the meeting edges of the sides to the separate compartments; sixth, to afford means for closing the entrance to the heat-connecting flues.

Our invention consists in the novel construction and combination of parts, such as will first be fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of our improved portable oven and the furnace-walls upon which it is mounted, with a portion of the covering-plates to the wall-flues and the clamping-plates broken away, also showing the damper-operating rods for regulating the supply of heat to one or more compartments and its escape. Fig. 2 is a longitudinal sectional view of the improved oven and furnace as seen in Fig. 1. Fig. 3 is a transverse sectional view of the improved oven, taken upon the line X X of Fig. 2. Fig. 4 is a detail view in perspective of one of separate compartments of the improved oven. Fig. 5 is a detail view in section of a portion of the outer side plate of separate compartments at the meeting edges, showing the clamping-plates and also the flue-closing plates and turnbuckle for holding the latter in place.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A represents our improved oven, which consists of separate portable compartments or lesser ovens B C D, each compartment being constructed alike in proportion and nearly so in internal arrangement of its several parts, said compartments being arranged in position one above the other in vertical series, as hereinafter more fully specified.

For the purpose of illustration one of the separate compartments D, as shown in Fig. 4, and which also is the lower compartment in the series, is rectangular in form and is composed of an exterior box-frame, having front and rear sides d d' and ends d^2 d^3, and an interior box-frame, the sides and ends of which are of a corresponding height and firmly welded or bolted at the respective corners of each frame. The interior frame is smaller in length and width than the exterior frame, and between said frames, extending entirely around the interior frame, is a space d^0 for a non-conductor, as hereinafter specified.

In the front side d of the outer frame, at a point equidistant from the ends of said frame, is a rectangular-shaped opening d^5 to the compartment of the oven, which is closed by a hinge drop-door d^6. Said opening d^5 also extends through the adjacent side of the interior frame d^4, and within said opening is fitted hermetically a rectangular-shaped frame d^8, which extends entirely around the sides of said opening and from the outer side of the front plate to the inner side of the interior frame d^4. The position of the lower side or sill of said frame is raised the thickness of the tile or floor of the compartment above the lower line of the front plate d.

In the space d^0 between the interior and exterior frames is placed mineral wool or other non-conducting substance.

Within the interior frame d^4 and near one end of said frame is a transverse flue-carrying partition d^9, which is the same height as the ends of the interior frame, and is connected rigidly at each end to the respective opposite sides of said frame, thus forming a vertical hot-air flue d^{10}, extending entirely across the end of the frame. At the other

end of the frame d^1 is a flue-carrying partition d^{12}, which extends across said end in the same manner and at a like distance from said end as described of the partition d^9, between which and the end of the frame d^4 is a vertical flue or passage $d^\times$.

In the upper portion of the partition d^9 are a series of square-shaped openings d^{13}, which are arranged a short distance apart in line with the upper edge of said partition. In the partition d^{12} are transverse openings, which are directly opposite the openings d^{13} in the partition d^9. In one of the openings d^{13}, near one side of the interior frame d^4, is fitted snugly one end of a square-shaped longitudinal hollow tube or flue d^{14}, the other end of which tube extends to and is fitted in one of the square-shaped openings in the plate d^{12} at the other end of the said frame and near the same side of said frame. In the other openings in each plate d^9 d^{12} are fitted tubes of the same length and construction as the tube d^{14}.

In the end d^2 of the exterior frame, opposite in position to the end of the flue d^{14}, is made a square-shaped opening corresponding in size to the opening d^{13} in the flue-plate d^9, which opening also extends through the adjacent end of the interior frame d^4. In said opening in the end d^2 of the exterior frame is fitted snugly a square-shaped tube $d^\times$, which extends to a point in line with the inner side of the end of the said interior frame adjacent to the end d^2 of the outer frame.

Other openings are made in both ends of the respective interior and exterior frames, corresponding in size and opposite in position to the ends of the respective longitudinal flues d^{14}.

In the space d^0, between the side d' of the exterior frame and the adjacent side of the interior frame and at a point equidistant from both ends of said frame, is a short vertical hot-air-escape pipe d^{15}, extending from the upper to the lower edge portion of said side d'. Upon the side of the pipe d^{15} toward the side of the interior frame d^4 is an elbow d^{16}, which extends through said side of said frame a short distance within the compartment. In the elbow d^{16} is a damper d^{17}, which is operated by a rod d^{19}, one end of which rod extends through said elbow and the other end is extended in the direction of the end d^2 of the frame or compartment D and through said end and is provided with an operating-crank d^{20}.

In the preparation of the main support for the improved compartments of the oven a walled furnace E of the usual construction is built, of the same proportions of the frame D, the upper or top portion of which consists of a flat surface of fireproof tile or brick e, which extends from the furnace-front nearly to the rear furnace-wall, as seen in Fig. 2, and at said rear wall is a smoke-passage e', extending upwardly through the top of said furnace. Upon the upper surface of the tile or brick e is a thin layer of sand e^2. The frame or compartment D of the oven is then mounted upon the top of the furnace with the door d^6 opening upon one of the longitudinal sides of the furnace-wall. An artificial floor e^3, of brick or tile or other material, is then laid within the interior frame d^4 upon the sand e^2, the upper surface of which floor is about level with the sill of the opening d^5. As soon as the lower frame or compartment D is laid another compartment C, which is constructed precisely the same as the frame D and with the same proportions, is placed directly upon the upper edges of said frame D, each flue and pipe registering with the other in position in opposite compartments. Upon the upper surface of the series of horizontal flues d^{14} is laid an artificial floor d^{21}, composed of fire-brick or tile or other material.

The upper or top compartment B of the oven is similar in construction and proportions as described of the compartment C, and is mounted upon the upper edge of the said frame or compartment, the door b being arranged above door d^6.

Upon the upper surface of the series of horizontal flues in the compartment B is an artificial floor c', which is also on the line with the side of door b, which door is arranged in position above the door c. The sides and ends of the top compartment B are extended a short distance above the level of the flues in said compartment, and instead of employing tiles or bricks upon the flues a thin covering of metal is placed over the flues, as seen in section in Fig. 2 at $b^\times$, and upon said covering is placed mineral wool or other non-conducting substance in sufficient quantity to retain heat. In the covering $b^\times$, which extends over each flue at back ends of the compartment and above said flues, are inserted short circular pipes b^3 b^4, which carry away smoke, &c.

For the purpose of regulating the supply of heat through the horizontal flues in each compartment of the oven a damper c^3 is placed in the flue $d^\times$ a slight distance above the line of the flues d^{14}, which extend entirely across the end of the compartment or frame D. This damper is attached to a damper-operating rod c^4, which extends through the front side of the compartment D, and is provided with a crank c^5. Directly above the damper c^3 and at a corresponding point in the flue $d^\times$, above the horizontal flues in the compartment C, is arranged a damper b^3, which is attached to a rod b^4, which rod extends through the front side of the frame or compartment C and is provided with a crank b^5.

In pipe b^8, leading outward from the flue d^0 from the oven, is a damper b^6, which extends to and nearly closes the entrance to the flues in the upper part of the compartment B, and is operated by means of a rod b^7, which rod extends forward toward the front side of the compartment B, and is provided with a crank b^8. In the pipe b^9 is a damper which is ar-

ranged in position and provided with a damper which nearly closes the ends of the flues in chamber B, and to which the operating-rod in the same manner as the rod b^7. In the flue d^0 and at a point in said flues a slight distance above the horizontal flues in the compartment C is a damper c^5, which is attached to and operated by a damper-rod c^6, the other end of which rod extends through the front side of the compartment in the same manner as the rods b^4 c^4, and is provided with a crank c^7.

For the purpose of closing the joints between the edges of the front plates in adjacent compartments of the oven an overlapping flange is cast or formed on the front side of the frame composing the upper and lower compartments. The front plates are preferably cast, while the ends of the frames are made preferably from sheet-steel. The joints in the ends of the outer frames are formed by separate flat strips of metal G G, which are connected together by screw-threaded bolts g^0 and nuts g^2. One of said plates is placed over the joints between the edges of adjacent ends and a plate on the inside of said exterior end plate and the screw-bolt inserted through both plates and the nut fitted to the end of the screw-bolt. Ordinarily the plates G G are bolted together with a washer g' between the plates, which retains them the proper distance apart. When the separate compartments are placed in position, the joint-closing plates are slipped over the end plate of a lower compartment, and when the upper compartment is placed in position the end plate fits snugly between the plates G G. The small flues d^* at one end of the frame or compartment D are closed by means of a flat plate d^{22}, the upper edge of which plate extends under the lower edge of the joint-closing plate G, which is bent outward a short distance for that purpose. The lower edge of said plate rests upon and is secured by a turn-button d^{23}. At the other end of the compartment D, and also at both ends of the other compartments B C, are similar joint-closing and flue-closing plates as described of the one end of said frame.

In utilizing our improved oven it will be observed that the compartments are made separate, which enables the employment of one or more compartments, as the necessity may require. The fire is made in furnace E beneath the compartment D, and the heat and smoke pass together up the flue $d^\times$, at the same time heating the floor e at the top of the furnace, and also the floor e^3 of the compartment D, so as to raise the heat in the said compartment at a comparatively high degree. Should it be desired to raise the compartment C of the oven, the damper c^3 is closed, so as to change the direction of the heat and compel the same to pass through the flues d^{14} into the flue-space d^9. The heat in said flues, by reason of the flat surface of said flues being brought in contact with the tiles d^{21}, imparts a greater degree of heat to the said tiles and raises the temperature the proper height, the surplus heat escaping through the flue d^9 and out through the pipe b^8. Should the compartment C be required for use, the damper c^5 is closed in position and the heat directed toward and the currents forced through the flues in said compartment into the flue $d^\times$ and escapes through the pipe b^9. Should the upper compartment B require to be used, the damper in the pipe b^9 is closed and the heat directed through the horizontal flues in said compartment, the heat escaping through the pipe b^8. In this manner the separate compartments of the oven are subject to different degrees of heat, and such articles as require a low degree of heat may be baking at the same time that other articles which require a high degree are being baked. The dampers c^3 b^3 may also be closed and the heat caused to pass through the flues d^{14} and thence through the flues in the compartment B, the damper on pipe b^3 being closed, permitting the uses of the upper and lower compartments only, while the intermediate compartment may be at a moderate degree of temperature. The heat in each compartment is rapidly reduced in degree by the opening of the damper d^{17} in the compartment and thus permitting its escape. Each compartment having a packing of mineral wool or other non-conducting substance between the interior and exterior frames, the heat is retained within the flues and directed as required, so that by opening one of the doors to one of the compartments and the damper in the pipe in the rear wall the compartment may be rapidly cooled and prepared for baking purposes.

When the flue d^{14} requires cleaning, the covering-plate is removed and access to the flues is readily obtained.

To prevent the excess of heat in the upper compartment B of the oven, the valve b^7 is so arranged as to extend in the direction of and nearly close the openings to the flues in compartment B, the heat being greater than in the lower compartments.

Having fully described our invention, what we now claim as new, and desire to secure by Letters Patent, is—

1. An improved portable oven consisting of separate compartments arranged in vertical series, each compartment having flues registering with the flues in an adjoining compartment and being detachably connected with an adjacent compartment in said series, substantially as shown and described.

2. In a portable oven consisting of separate compartments and registering heat-circulating flues in each compartment, the combination of an escape-pipe in each one of said compartments and between the walls of the said compartments, and an elbow extending into said compartment having a pipe-closing damper, substantially as shown and described.

3. In a portable oven consisting of separate

compartments arranged in vertical series, and each compartment composed of separate interior and exterior frames, the combination with the horizontal meeting edges of the separate plates in said exterior frame of detachable closing-plates on each side of the joint between the meeting edges of said plates, substantially as shown and described.

4. In a portable oven consisting of separate horizontal compartments arranged in vertical series and each compartment having union-plates closing the joints at the meeting edges and flues at both ends of said compartment registering with the flues in an adjoining compartment and having flue-closing dampers, a series of horizontal flues in each compartment communicating at the end with the respective flues smoke-flues in the top of said oven directly above the respective vertical flues in each compartment of the oven and valves in said flues extending in the direction and nearly over the entrance to the horizontal flues in the upper compartment of the oven substantially as described.

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