O. WUNDRACK.

MULTIPLE BAKER'S OVEN.

APPLICATION FILED MAR. 3, 1919.

1,339,616.

Patented May 11, 1920.

3 SHEETS—SHEET 1.

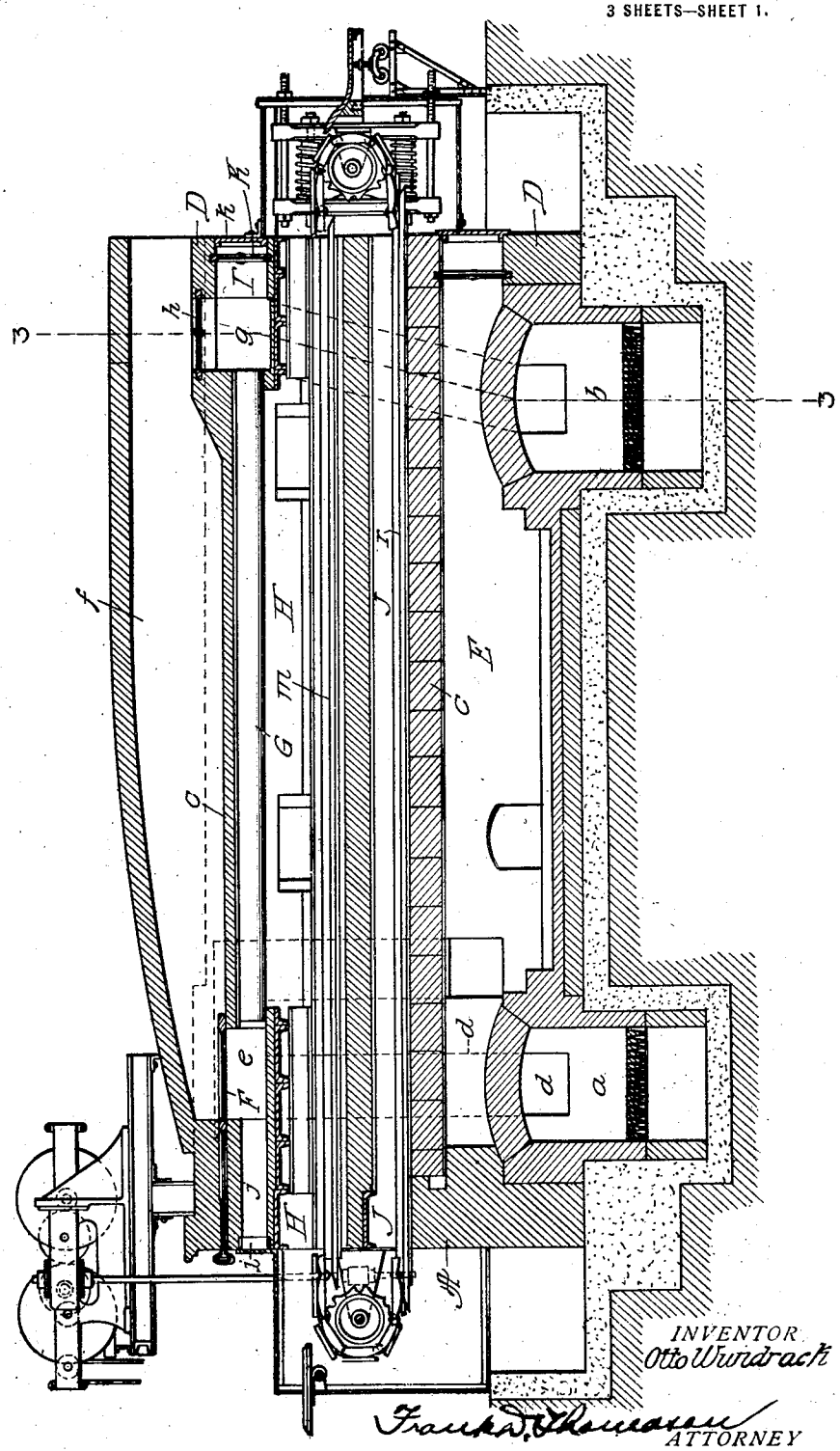


Fig. 1.

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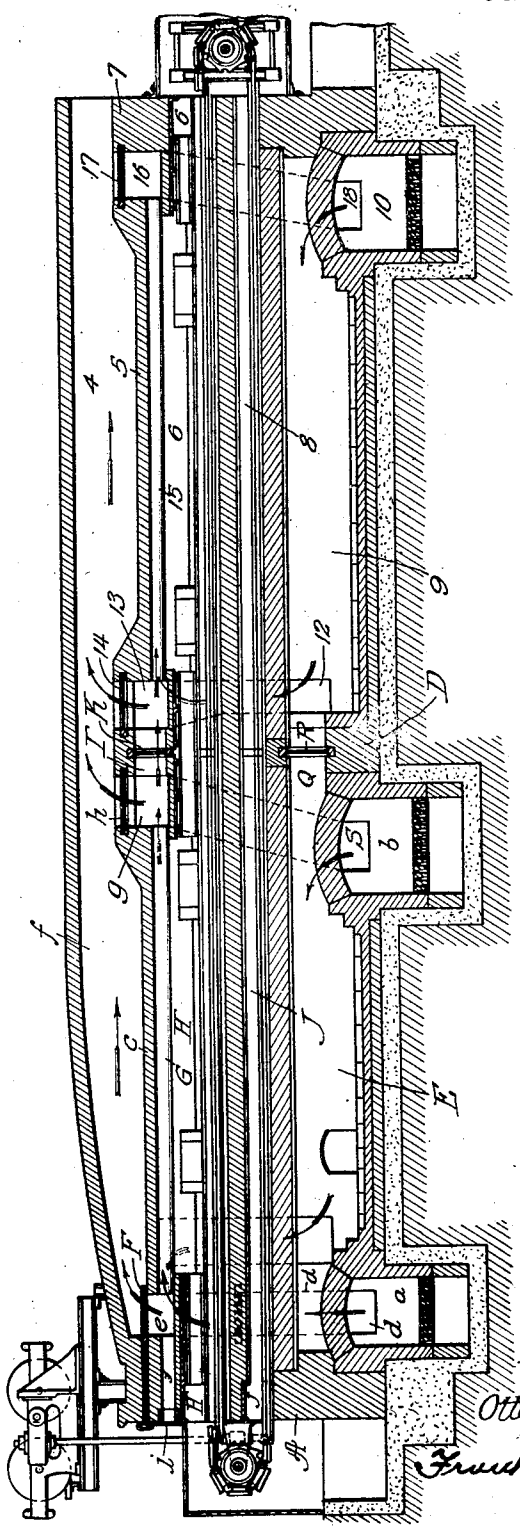


Fig. 2.

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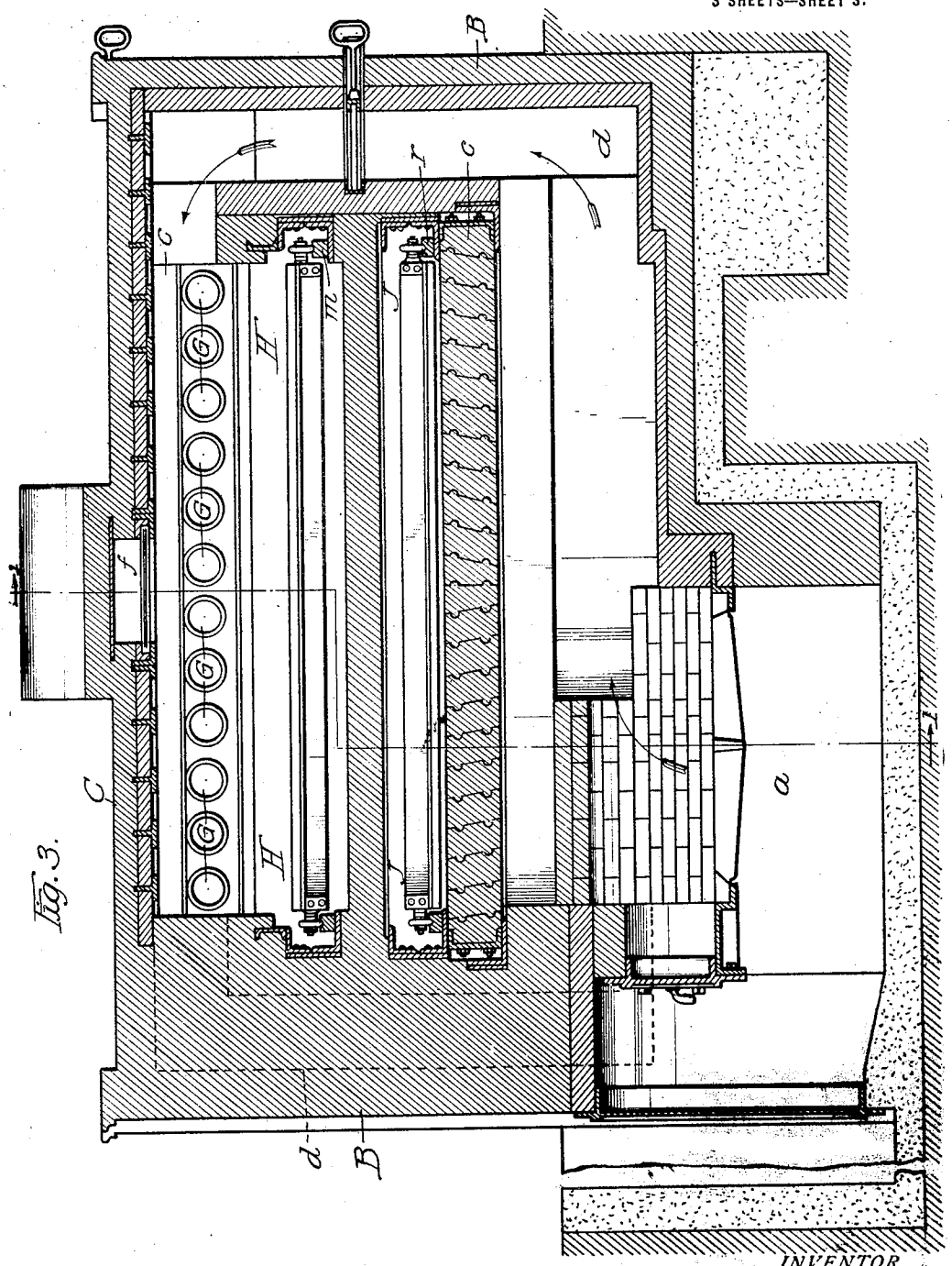


Fig. 3.

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BY
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UNITED STATES PATENT OFFICE.

OTTO WUNDRACK, OF MAYWOOD, ILLINOIS, ASSIGNOR TO PETERSEN OVEN COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MULTIPLE BAKER'S OVEN.

1,339,616. Specification of Letters Patent. Patented May 11, 1920.

Substitute for application Serial No. 148,555, filed February 14, 1917. This application filed March 3, 1919. Serial No. 280,384.

To all whom it may concern:

Be it known that I, OTTO WUNDRACK, a citizen of the United States, residing at Maywood, in the county of Cook and State of Illinois, have invented new and useful Improvements in Multiple Bakers' Ovens, of which the following is a full, clear, and exact description.

My invention relates to bakers' ovens, and particularly to an oven of this character in which the baking-chamber thereof extends longitudinally through the structure from end to end.

Heretofore when ovens of this type were built the various features thereof, such as the heat generating and heat distributing contrivances and the construction of the metal framework and the masonry were such that when completed the work of the oven was limited to its predetermined estimated capacity, and if it were desired to increase this capacity the oven had to be torn down and rebuilt, or additional independent ovens installed.

The object of my invention is to build a multiple baker's oven of several corresponding oven-units, each of which is complete in itself and yet can have another unit or units added thereto in alinement to increase the capacity and expedite the work thereof as desired. A further object is to accomplish a saving of fuel when the oven has two or more units by allowing the furnace in one unit to die out and utilize the heat generated in the other units to heat the entire oven structure. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a longitudinal vertical section of a single unit of my improved multiple baker's oven taken on dotted line 1, 1, Fig. 3.

Fig. 2 is a similar section of several of said units assembled into one continuous oven, drawn to a smaller scale.

Fig. 3 is a transverse vertical section taken on dotted line 3—3, Fig. 1.

Referring to the drawings, A represents the front-wall of the front unit of my improved baker's oven; B, B, the side-walls thereof; C the roof, and D the rear end wall of the same. This front oven unit is built on a suitable foundation and is partially surrounded by a suitable areaway and is heated by two transversely arranged furnaces; one, *a*, is built partly below the plane of the foundation of the oven just back of the front-wall, and the other, *b*, is built in about the same level in about the same relative position to the rear end-wall D of the same. Furnace *a* is generally used to assist in raising the temperature to obtain the desired heat to start the oven, and it is customary just as soon as the rear furnace is operating satisfactorily and the temperature of the oven is high enough to let the front furnace die out. At the left hand end of these furnaces (which terminate about midway between the side-walls of the oven) their side-walls and arches terminate and discharge into the longitudinally disposed heat-chamber E, which latter is arched over by a suitable arch *c*, and the heated products of combustion discharge therefrom through a vertical valve controlled flue *d* into an ante-chamber *e* located over the entrance of the baking-chamber of the oven right back of the front-wall thereof.

The roof of this ante-chamber is provided with a suitable opening up through which the products of combustion can discharge into the horizontal chimney-flue *f* that extends immediately above the roof of the oven and leads direct to the chimney (not shown). This opening is closed by a plate-valve F that has a suitable rod extending longitudinally therefrom out through the front-wall and terminates in a suitable handle that can be grasped to operate the valve whenever desired. This ante-chamber, when valve F is closed, discharges rearwardly into a series of longitudinal tubes G that extend through the upper portion of and practically form the ceiling of the baking-chamber H, and the rear ends of these tubes discharge into discharge-chamber *g*. Chamber *g* has an opening in its ceiling by means of which said chamber can communicate directly with flue *f* that leads to the chimney, and a horizontal plate-valve *h* which is movable transversely, closes or controls the area of this opening.

Front-wall A of the oven is provided with a transversely arranged series of longitudinally extending openings *j* therein that aline with tubes G and the front ends of these openings are closed by suitable covers *i* by removing which access can be had to said

tubes to clean them out. The rear wall of this front oven-unit has a longitudinal passage I therein, the forward end of which is open to chamber *g* and the rear end of which is closed by a suitable cover *k*. At a suitable point between its ends, passage I has a vertically disposed transverse plate-valve K therein which is reciprocable transversely to control the opening of said passage.

The baking-chamber H extends from one end to the other of the oven-units, and it is open at both ends, and between this baking-chamber and heating-chamber E there is a longitudinally disposed reheating-chamber J which extends the entire length of the oven-unit just above arch *c* and is open at both ends. Both the baking-chamber and the reheating-chamber of the front unit have tracks *m*, *n*, respectively, the ends of which when said unit is alone used extend out of the open ends of the baking-chamber and reheating-chamber a short distance. A suitably constructed traveling hearth (which, together with conjunctive devices, is made the subject-matter of an application for Letters Patent of the United States filed March 15, 1919, Serial No. 282,898) is supported on these tracks as it travels rearwardly through the baking-chamber and returns forwardly through the reheating-chamber. The ends of this endless hearth pass around suitable sprocket-wheels M, N, respectively, which latter are inclosed within rectangular shaped housings O, P, in order to prevent the escape of the heat. The details of construction of these housings are immaterial in so far as my invention is concerned.

The rear wall of the oven just above the plane of furnace *b* is provided with a longitudinal passage Q, which is provided with a transversely movable valve-plate R, and has its rear end closed by a suitable cover *q*.

When it is desired to enlarge and increase the capacity of this front oven-unit, the rear-wall of the same is utilized as the front-wall of the added rear oven-unit, which latter, as shown in Fig. 2 of the drawings, is constructed so as to provide a rearwardly extending continuation 4 of the chimney-flue *f*. The roof 5 of this added oven-unit is in the same plane as roof C of the front unit and arches over the baking-chamber 6, which latter corresponds to and is a continuation of baking-chamber H of the forwardmost unit and extends through its own rear-wall 7. This rear unit also has a reheating-chamber 8 which corresponds with and forms a continuation of reheating-chamber J of the front oven-unit, and it also extends through its rear-wall 7 and is open at its rear end. This rear oven-unit is also provided with a heat-chamber 9 which receives the heated products of combustion from a transversely disposed furnace 10 adjacent rear-wall 7 thereof, which is built in the same level as furnaces *a* and *b* of the forward oven-unit and corresponds in construction thereto.

When passage Q is closed by valve R the products of combustion from heat-chamber 9 discharges into a vertical valve-controlled flue 12, the lower end of which is open to chamber 9 immediately to the rear of rear-wall D of the front oven-unit. This vertical flue extends up through the side-wall of the rear unit of the oven and discharges at its upper end into a transversely disposed ante-chamber 13, the dimensions of which, preferably, correspond to chamber *g* to which latter it is connected by passage I. The top of this ante-chamber 13 is closed by a transversely movable valve 14 that corresponds in construction to valve *h* of receiving-chamber *g*, and chamber 13 is connected by a series of longitudinally disposed tubes 15 (corresponding to tubes *g*) to a discharge-chamber 16 built in the furnace structure above the discharge end of baking-chamber 6. Discharge-chamber 16 discharges into flue 4 immediately in front of rear-wall 7 of the rear oven-unit, and this discharge is controlled by a horizontally disposed laterally movable plate-valve 17 that corresponds in construction and operation to plate-valve 14.

When it is desired to operate the multiple baker's oven shown in Fig. 2 of the drawings, furnaces *a*, *b* and 10 are started, and at first the products of combustion from furnace *a* discharge into vertical flue *d* in the side-wall opposite the entrance to furnace *a*, and discharge from furnace *b* into the oppositely located lower end of a vertical valve-controlled flue S, which latter extends through the same side-wall in which flue *d* is made, and discharges into one end of exit-chamber *g*, and the products of combustion from furnace 10 discharge into the lower end of a vertically disposed valve-controlled flue 18 which is made in the same side-wall as flues *e* and S and from thence into one end of the transverse exit-chamber 16.

After the oven has become sufficiently heated, valves K and R are opened and flues S, 12 and 18 are closed by plate-valves similar to that in flue *d*, but not shown in the drawings, and valves F, *h* and 14 are closed and valve 17 opened, whereupon the heated products of combustion from furnaces 10 and *b* will flow forward through heating-chambers 9 and E up through flue *d* into ante-chamber F and from thence rearwardly through tubes G that heat the baking-oven of the front oven-unit and rearwardly through chambers *g* and 13, and tubes 15 that heat the baking-oven in the rear oven unit, into exit-chamber 16 and discharge from the latter into flue 4 in transit to the

chimney. After the oven has become sufficiently heated, furnace *a* is permitted to die out, and the heat from furnaces *b* and 10 are depended upon to obtain the necessary temperature for the baking and reheating-chambers of the oven. In very warm weather furnace *b* may also be permitted to die out and the heat from furnace 10 can be relied upon to provide the necessary heat for the oven.

From the construction of my improved multiple oven, as hereinbefore described and as illustrated in the drawings, it will be apparent that valves K and R can be closed and valve *h* opened and the front oven-unit be operated without the rear oven-unit, or, if desired, the front oven-unit could be cut-out by closing valves K and R and the rear unit be operated. It is also apparent that, if desired, a third oven-unit could be added to the oven structure in the same manner as the rear unit, hereinbefore described and as illustrated in the drawings. By increasing the length of the oven by the additional oven-units it is possible for a baker to first build the forward unit and rely upon it for his output until he is financially able to add a second oven-unit thereto, and so on, for the longer the oven the more bakery goods can be baked with a relatively greater economy in time and fuel than could possibly be accomplished where only the one unit is used.

What I claim as new is:

1. A baker's oven comprising a plurality of longitudinally alined communicating oven-units in one continuous structure separated by a common transverse wall each having a baking-chamber and a reheating-chamber extending longitudinally therethrough which communicate and aline with similar chambers in the next oven-unit, suitable communicating heating devices for said units, communicating heat distributing devices therefor, and means for conveying bakery goods rearwardly through the baking chambers that return forward through said reheating-chamber.

2. A baker's oven comprising a plurality of longitudinally alined communicating oven-units in one continuous structure separated by a common transverse wall each having a baking-chamber and a reheating-chamber extending longitudinally therethrough which communicate and aline with similar chambers in the next oven-unit, suitable communicating heating devices in one of said units, communicating heat distributing devices therefor, and means for conveying bakery goods rearwardly through the baking chambers that return forward through said reheating-chamber.

3. A baker's oven comprising a plurality of longitudinally alined communicating oven units separated by a common transverse wall each having a baking-chamber and a reheating-chamber which communicate and aline with similar chambers in the next unit, a series of parallel tubes traversing the top of the reheating-chamber that communicate, longitudinally extending communicating heat-chambers therein below the reheating-chambers, communicating heat generators discharging into the same, valve-controlled vertically disposed flues connecting the front of said heating-chambers with the front ends of said tubes, the heat chambers in said units being arranged and connected end to end, and an endless hearth adapted to move rearward through said baking-chambers and forward in said reheating chambers.

4. A baker's oven comprising a plurality of longitudinally communicating oven-units, alining baking-chambers and reheating-chambers extending longitudinally therethrough, longitudinally disposed heat-chambers in each of said oven-units below the reheating-chambers thereof, a valve controlled passage connecting said heat chambers, suitable heat generators that discharge into the latter, and a traveling hearth adapted to move through said baking and reheating chambers.

5. A baker's oven comprising a plurality of longitudinally communicating oven-units, alining baking-chambers and reheating chambers extending longitudinally therethrough, longitudinally disposed heat-chambers in each of said oven-units below the reheating-chambers thereof that are connected by a valve-controlled passage, a heat distributing system in each of said units connected with said heat-chambers, and a traveling hearth adapted to move through said baking and reheating chambers.

6. A baker's oven comprising a plurality of longitudinally communicating oven-units, baking-chambers and reheating-chambers in each of said units which when said units are connected aline and extend longitudinally through the oven structure, longitudinally disposed heat-chambers in each unit arranged below said reheating-chambers, a heat distributing system for each unit arranged below said reheating-chambers, a heat distributing system for each unit which is connected to said heat-chambers and has valve-controlled communication with each other and with a suitable chimney-flue, said chimney-flue and an endless hearth adapted to move through said baking-chambers and reheating chambers.

7. A baker's oven comprising a plurality of longitudinally communicating oven-units, baking-chambers and reheating-chambers in each of said units which when said units are connected aline and extend longitudinally through the oven structure, longitudinally disposed heat-chambers in each unit ar-

ranged below said reheating-chambers, a valve-controlled passage connecting the same, a heat distributing system for each unit which is connected to said heat-chambers and has valve-controlled communication with each other and with a suitable chimney-flue, said chimney-flue, and an endless hearth adapted to move through said baking-chambers and reheating-chambers.

8. A baker's oven comprising a plurality of longitudinally communicating oven-units, baking-chambers and reheating-chambers in each of said units which when said units are connected aline and extend longitudinally through the oven structure, longitudinally disposed heat-chambers in each unit arranged below said reheating-chambers, a suitable heat generator adjacent the rear of each of the same, a heat distributing system for each unit which is connected to said heat-chambers, and a valve in the communicating passage between said chambers, and a suitable chimney-flue for each heat chamber, said chimney-flue and an endless hearth adapted to move through said baking-chambers and reheating-chambers.

9. A baker's oven comprising a plurality of longitudinally communicating oven-units, baking-chambers and reheating-chambers in each of said units which when said units are connected aline and extend longitudinally through the oven structure, longitudinally disposed heat-chambers in each unit arranged below said reheating-chambers, heat generators in each of the same, a passage connecting said heat-chambers, a valve therein controlling the same, a heat distributing system for each unit which is connected to said heat-chambers, and a valve controlled passage between the adjacent ends of the same and a superposed chimney-flue, said chimney-flue, and an endless hearth adapted to move through said baking-chambers and reheating-chambers.

10. A baker's oven comprising a plurality of longitudinally alined communicating oven-units, a common transverse wall separating the same, communicating baking-chambers and reheating-chambers below the same in each of said units that aline and extend through said ovens, longitudinally disposed communicating heat-chambers in each unit below the reheating-chambers, communicating heat radiating devices in said baking-chamber, vertical flues connecting the forward portion of each of said heating-chambers and said heat radiating devices, heat generators in said heat-chambers, and an endless traveling hearth movable through said baking-chamber and said reheating chamber.

11. A baker's oven comprising a plurality of longitudinally communicating oven-units, a baking-chamber and a reheating-chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a valve controlled opening connecting said ante-chamber and chimney-flue, a heat-chamber below said reheating-chamber, valve-controlled vertical flues connecting said heat-chamber with said ante-chamber, and an endless traveling hearth movable through said baking and reheating chambers.

12. A baker's oven comprising a plurality of longitudinally communicating oven-units, a baking-chamber and a reheating chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a valve-controlled opening connecting said ante-chamber and chimney-flue, a valve-controlled passage connecting the heat distributing devices of the front oven-unit with the ante-chamber of the second oven-unit, a heat-chamber below said reheating-chamber, valve-controlled vertical flues connecting the said heat-chamber with said ante-chamber, and an endless traveling hearth movable through said baking and reheating-chambers.

13. A baker's oven comprising a plurality of longitudinally communicating oven-units, a baking-chamber and a reheating-chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a discharge-chamber in each unit into which the heat distributing devices thereof discharge, a valve-controlled opening connecting said ante-chamber and chimney-flue, a heat chamber below said reheating-chamber, valve-controlled vertical flues connecting the said heat-chamber with said ante-chamber, and an endless traveling hearth movable through said baking and reheating chambers.

14. A baker's oven comprising a plurality of longitudinally communicating oven-units, a baking-chamber and a reheating-chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a discharge chamber in each unit into which the heat distributing devices thereof discharge, a valve-controlled opening connecting said ante-chamber and chimney-flue, a valve-controlled passage connecting the discharge-chamber of the forward oven unit to the

ante-chamber of the following unit, a heat-chamber below said reheating-chamber, valve-controlled vertical flues connecting the said heat-chamber with said ante-chamber, and an endless traveling hearth movable through said baking and reheating chambers.

15. A baker's oven comprising a plurality of longitudinally communicating oven-units, a baking-chamber and a reheating-chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a discharge-chamber in each unit into which the heat distributing devices thereof discharge, valve controlled openings connecting said discharge chambers with said chimney-flue, a valve-controlled opening connecting said ante-chamber and chimney-flue, a heat-chamber below said reheating-chamber, valve controlled vertical flues connecting the said heat-chamber with said ante-chamber, and an endless traveling hearth movable through said baking and heating chambers.

16. A baker's oven comprising a plurality of longitudinally communicating oven units, a baking-chamber and a reheating-chamber below the same in each of said units, a chimney-flue above said baking-chamber, an ante-chamber above the entrance of the baking-chamber, heat distributing devices for said baking-chamber communicating with said ante-chamber, a discharge chamber in each unit into which the heat distributing devices thereof discharge, valve controlled openings connecting said discharge chambers with said chimney flue, a valve controlled opening connecting said ante-chamber and chimney-flue, a valve-controlled passage connecting the discharge-chamber of the forward oven unit to the ante-chamber of the following unit, a heat-chamber below said reheating-chamber, valve-controlled vertical flues connecting the said heat chamber with said ante-chamber, and an endless traveling hearth movable through said baking and reheating chambers.

In witness whereof I have hereunto set my hand this 19th day of November, 1918.

OTTO WUNDRACK.

Witnesses:
EVA STREIT,
FRANK D. THOMASON.