

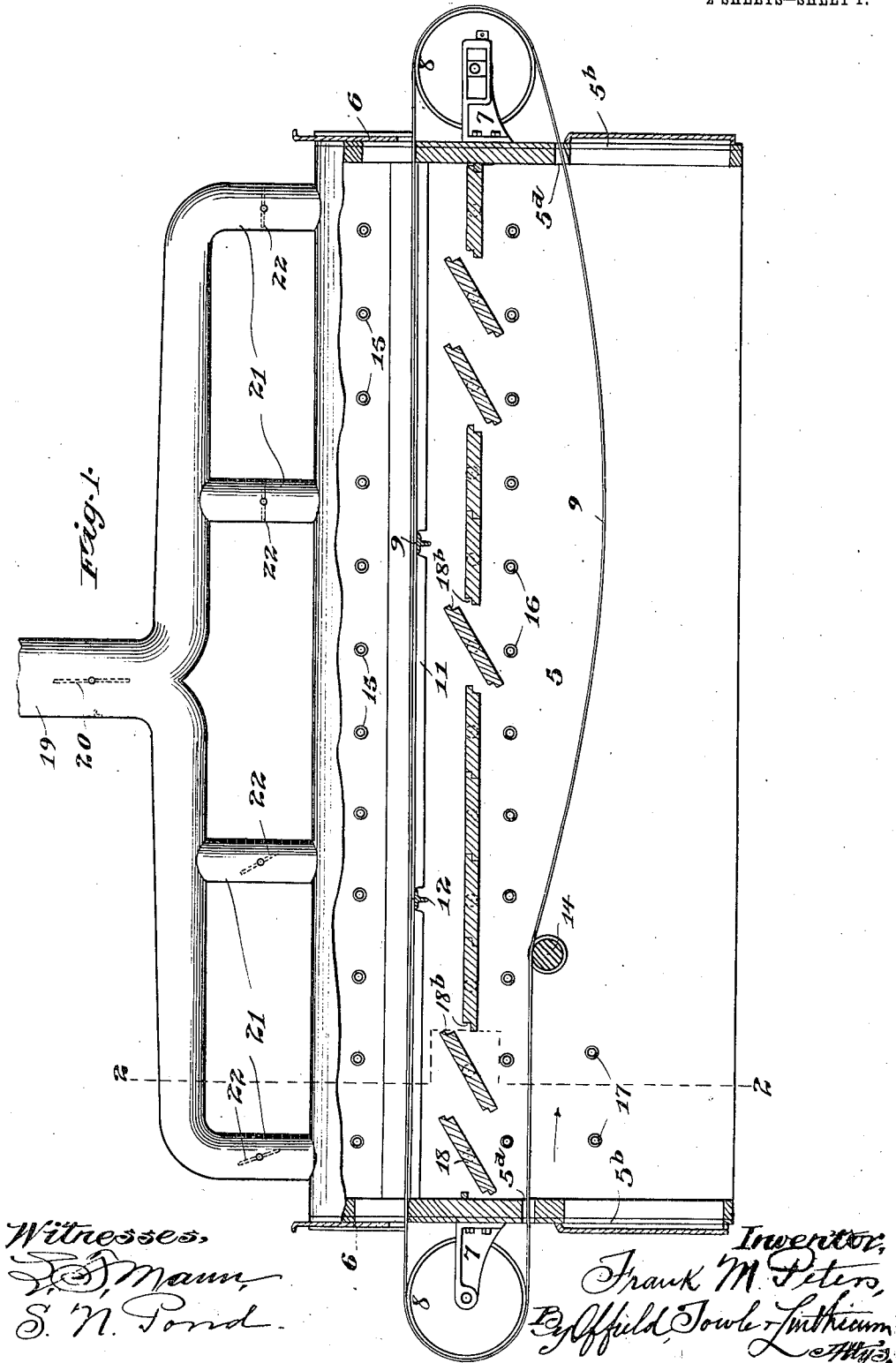
No. 838,270.

PATENTED DEC. 11, 1906.

F. M. PETERS.
BAKING OVEN.

APPLICATION FILED OCT. 15, 1903.

2 SHEETS—SHEET 1.



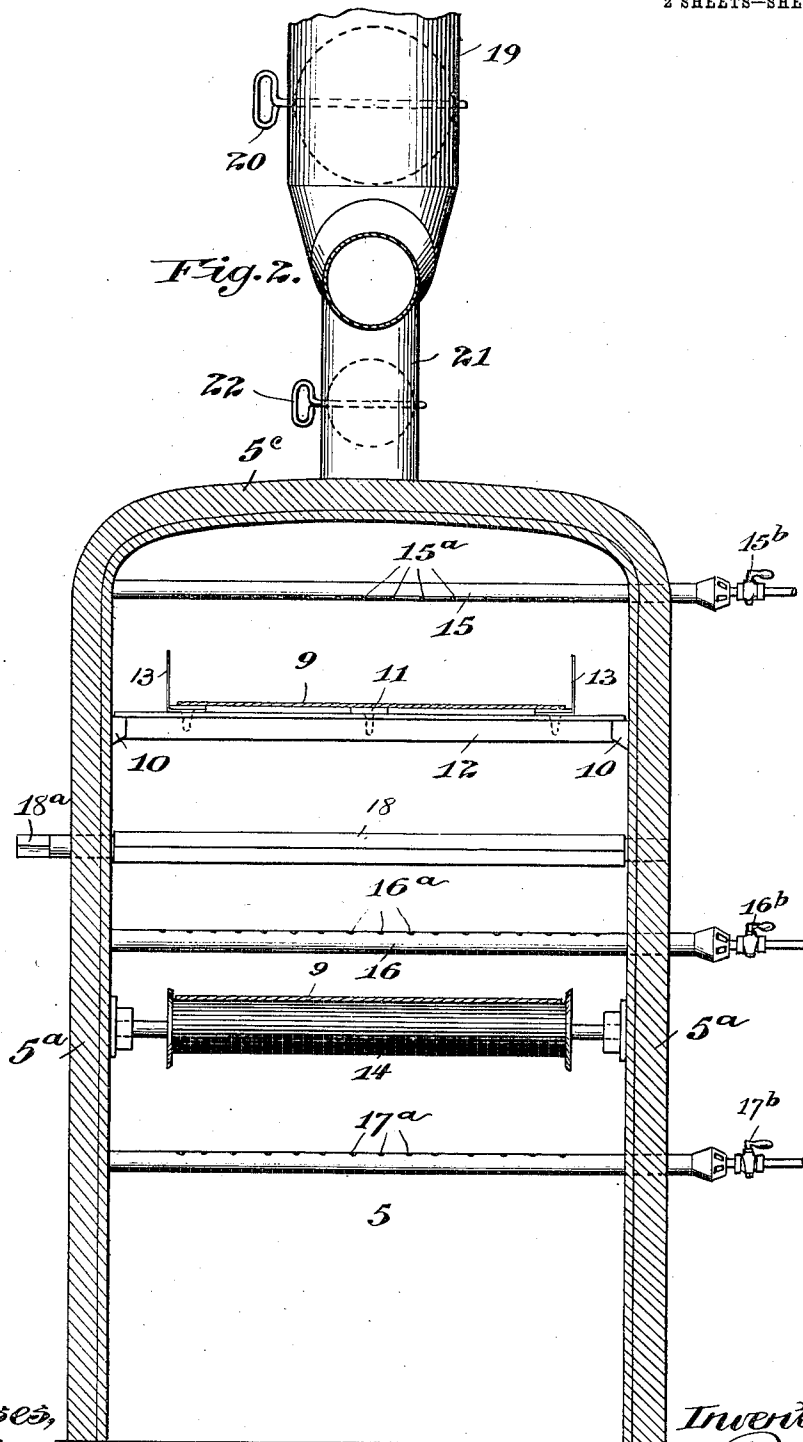
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK M. PETERS, OF CHICAGO, ILLINOIS.

BAKING-OVEN.

No. 838,270.

Specification of Letters Patent.

Patented Dec. 11, 1906.

Application filed October 15, 1903. Serial No. 177,154.

To all whom it may concern:

Be it known that I, FRANK M. PETERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Baking-Ovens, of which the following is a specification.

My invention relates to baking-ovens, and has for its general object to provide certain improvements in the character and construction of such ovens, said improvements relating in part to the provision of a flexible endless conveyer with means whereby the same is caused to travel and convey the goods through the oven at such a speed as effects the proper baking of the goods during such travel; in part to a novel means of heating the oven; in part to a novel means of directing and controlling the flow of hot-air currents through said oven; in part to means for regulating and directing the application of heat from the main burners to the upper or carrying section of the conveyer; in part to means for preliminarily heating the conveyer before the goods are introduced thereto, and in part to other minor details of construction and arrangement, all as hereinafter more particularly described, and pointed out in the claims.

Referring to the accompanying drawings, wherein is shown an oven constructed in accordance with and embodying the novel improvements of my invention, Figure 1 is a side view, partly in elevation and partly in longitudinal vertical section, of so much of the oven as is essential to clearly illustrate my improvements; and Fig. 2 is a vertical transverse sectional view of the same on the line 2 2 of Fig. 1 looking in the direction of the arrow.

Referring to the drawings, 5 designates the main chamber of the oven, which is here shown as substantially rectangular in cross-section, being bounded by parallel vertical side walls 5^a, parallel vertical end walls 5^b, and a substantially flat roof 5^c, rounded off at its junctions with the side walls. The end walls 5^b are open at their upper portions, and these openings are controlled by vertically-reciprocable doors or gates 6. Immediately below the openings controlled by these doors are secured brackets 7, in and between which latter are journaled a pair of drums 8, which receive and support an endless fiat conveyer 9. This conveyer is preferably a thin sheet or apron of steel, although any other flexible

and fireproof material may be used for this purpose, if desired. To the shaft of one or both of the drums 8 suitable power connections (not shown) are applied in any well-known way to effect the travel of the conveyer-apron at any desired rate of speed, according to the heat existing in the oven and the character of the goods being baked. The upper or carrying section of the conveyer passes through the openings above the end walls of the oven controlled by the doors 6, the latter being raised sufficiently for this purpose, while the lower section of the conveyer passes through transverse slots (indicated at 5^d) in said end walls below the bracket 7.

On ledges 10, extending horizontally of the inner surfaces of the side walls of the oven, is supported a skeleton frame consisting of longitudinal and transverse beams 11 and 12, respectively, this frame constituting a support for the upper section of the conveyer, over which the latter slides. Along either side of this support are preferably arranged low walls 13, designed to shield the goods lying along the edges of the conveyer from the direct heat-rays of the underlying burners and prevent scorching or overbaking thereof. Transversely of and between the side walls of the oven, below the lower section of the conveyer, is mounted one or more rollers 14, designed to support said lower section.

The oven may within the purview of the invention be heated by any suitable heating means; but I have herein shown the same as designed to be heated by gaseous fuel, and for this purpose I have disposed within the oven and between the side walls thereof a number of burner-pipes suitably located to produce the desired heating effects. One row of such burner-pipes is shown at 15 disposed at a suitable height above the upper carrying-section of the conveyer and having their burner-apertures 15^a formed in their lower portions, as shown in Fig. 2, to direct the flame-jets downwardly toward the upper surface of the goods on the conveyer. Another corresponding series of burner-pipes (designated by 16) is disposed beneath the carrying-section of the conveyer and its support, said pipes having their burner-apertures 16^a formed in their upper portions, so as to direct the flame-jets upwardly toward the under side of the carrying-section of the conveyer. 17 designates a group of burner-pipes disposed beneath the outgoing end of the lower section

of the conveyer and having their burner-apertures 17^a disposed upwardly, so as to effect a preliminary heating of the conveyer just prior to its reception of the goods.

5 The regulation and tempering of the heat emitted by the burner-pipes are effected principally by cocks or valves with which each of said pipes is equipped, said cocks or valves being indicated at 15^b, 16^b, and 17^b in Fig. 2.
 10 By the proper manipulation of these valves not only may the total amount of heat imparted to the oven be nicely regulated, but the heating effects can be localized as desired to effect a top or bottom bake, or both, to just
 15 the degree required or desired. Variations in the degree of heat at different points in the oven can also be obtained by lighting some of the burners and allowing the others to remain unignited. It is also desirable to secure a
 20 further regulation of the heating effect of the series of burners underlying the carrying-section of the conveyer in the way of providing for either a direct or indirect heat therefrom or a combination of direct and indirect heat.
 25 To this end my invention embraces a mechanism for this purpose which in the preferred form herein shown consists of a series of shutters 18, pivotally mounted in the side walls of the oven above the burners 16, the stems or
 30 journals of said shutters extending through the wall of the oven at one end and terminating in a wrench-hold, as indicated at 18^a in Fig. 2. The side margins of the shutters are provided with mating joints, as shown at 18^b,
 35 so that when the shutters are turned to horizontal position their margins overlap, and when united they constitute an unbroken shield between the burner-pipe 16 and the carrying-section of the conveyer.

40 Surmounting the roof of the oven is a main discharge flue or chimney 19, provided with a damper 20, which flue communicates with the interior of the oven through the roof by means of a series of branch flues 21, each
 45 equipped with a similar damper 22.

The operation of the oven and the benefits and advantages secured thereby may be briefly described as follows: Power being applied to the shaft of one of the drums 8,
 50 said drum is rotated, producing a continuous travel of the conveyer-apron at any desired speed. Fuel being turned on through the burner-pipes and ignited, the chamber of the oven and the conveyer are preliminarily
 55 heated to make them ready for the reception of the goods to be baked. The door 6 having then been raised sufficiently to enable the goods to clear the lower edges thereof, said goods are then delivered by hand or by any
 60 suitable auxiliary mechanism to the entering end of the upper carrying-section of the conveyer, whence they are caused to travel entirely through the longitudinal extent of the interior of the oven at a such rate of speed as
 65 serves to impart thereto the desired degree

of baking effect, the goods being delivered at the outgoing end of the carrying-section of the conveyer onto any suitable receiver. While the goods are being baked, the degree of heat imparted by the burners and the desired localization of the heat can be nicely
 70 regulated by the valves or cocks controlling the individual fuel-inlet pipes. By a proper manipulation of the shutters 18 the heat imparted by the burners 16 to the under side of
 75 the carrying-section of the conveyer can also be nicely regulated, so as to provide for a direct or indirect heating effect upon the latter, or a combination of the two. For instance, some or all of the shutters may be opened
 80 more or less to allow the direct heat-rays to reach the baking-chamber. On the other hand, an indirect heating effect may be secured by closing the shutters. This secures such regulation in the baking-chamber as to
 85 produce the desired baking effects. The shutters 18, in conjunction with the several dampers 22, are also highly useful in regulating and controlling the extent and direction of the flow of the heated currents. For instance,
 90 by opening all of the shutters or by opening some of them at practically uniform intervals from one end of the oven to the other and by partially or wholly opening all of the dampers 22 the heated currents will
 95 rise practically straight from the burners to the flues 21 with but little, if any, circulation through the oven. On the other hand, by opening only one or more shutters at one end of the oven and the damper 22 at the opposite
 100 end of the oven the heated currents may be caused to travel the entire length of the oven before being discharged. By other regulations of the shutters and dampers a greater or less circulation of the heated currents,
 105 as desired, can be obtained, as will be obvious. The main damper 20 in the flue or chimney 19 regulates the rapidity with which the heated currents in the oven are discharged.

110 I have not deemed it necessary to illustrate herein means for igniting the several burners, since any suitable or convenient igniting device, such as a pilot-light, may be employed, preferably in association with a peep-hole
 115 in the wall of the oven, suitably located relatively to each of the burner-pipes to enable the condition of the latter to be readily ascertained from the outside, such peep-holes for this purpose being well known and
 120 understood in connection with ovens of various sorts.

It is obvious that many changes and modifications in the structure and arrangement of the apparatus hereinabove described might
 125 readily suggest themselves to the mechanic or artisan skilled in the manufacture and operation of baking-ovens, which modifications or changes would still be within the spirit and scope of this invention. I do not, there-
 130

fore, limit the invention to the detail features either of construction or relative arrangement herein shown and described except to the extent that they are made the subject of specific claims.

I claim—

1. In a baking-oven, the combination of a baking-chamber, an endless conveyer passing therethrough, heating means situated within the baking-chamber below the carrying portion of the conveyer, and a shield interposed between said heating means and carrying portion of the conveyer, said shield being provided with a plurality of independently-operable sections by which the heat from said heating means may be directed to any point of the conveyer, within the baking-chamber, or may be distributed from one end of the chamber to the other, substantially as described.

2. In a baking-oven, the combination of a baking-chamber, an endless conveyer passing therethrough, heating means situated within the baking-chamber below the carrying portion of the conveyer, a shield interposed between said heating means and carrying portion of the conveyer, said shield being provided with a plurality of independently-operable sections by which the heat from said heating means may be directed to any point of the conveyer, within the baking-chamber, or may be distributed from one end of the chamber to the other, and a plurality of valved flues communicating with the baking-chamber at different points longitudinally thereof, substantially as described.

3. In a baking-oven, the combination of a

baking-chamber, an endless conveyer passing therethrough, heating means situated within the baking-chamber above and below the carrying portion of the conveyer, and a shield adapted to cut off communication between the lower heating means and the carrying portion of the conveyer, said shield comprising a plurality of independently-operable sections, substantially as described.

4. In a baking-oven, the combination of a baking-chamber, an endless conveyer passing therethrough, heating means situated within the baking-chamber above and below the carrying portion of the conveyer, a shield adapted to cut off communication between the lower heating means and the carrying portion of the conveyer, said shield comprising a plurality of independently-operable sections, and a plurality of valved flues communicating with the baking-chamber at different points longitudinally thereof, substantially as described.

5. In a baking-oven, the combination with a baking-chamber and an endless conveyer mounted to travel in and through said chamber, of heating devices in said chamber beneath the carrying-section of the conveyer, and a shield interposed between said heating devices and said carrying-section of the conveyer, said shield comprising a series of independently-operable pivoted edgewise overlapping shutters, substantially as and for the purpose set forth.

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