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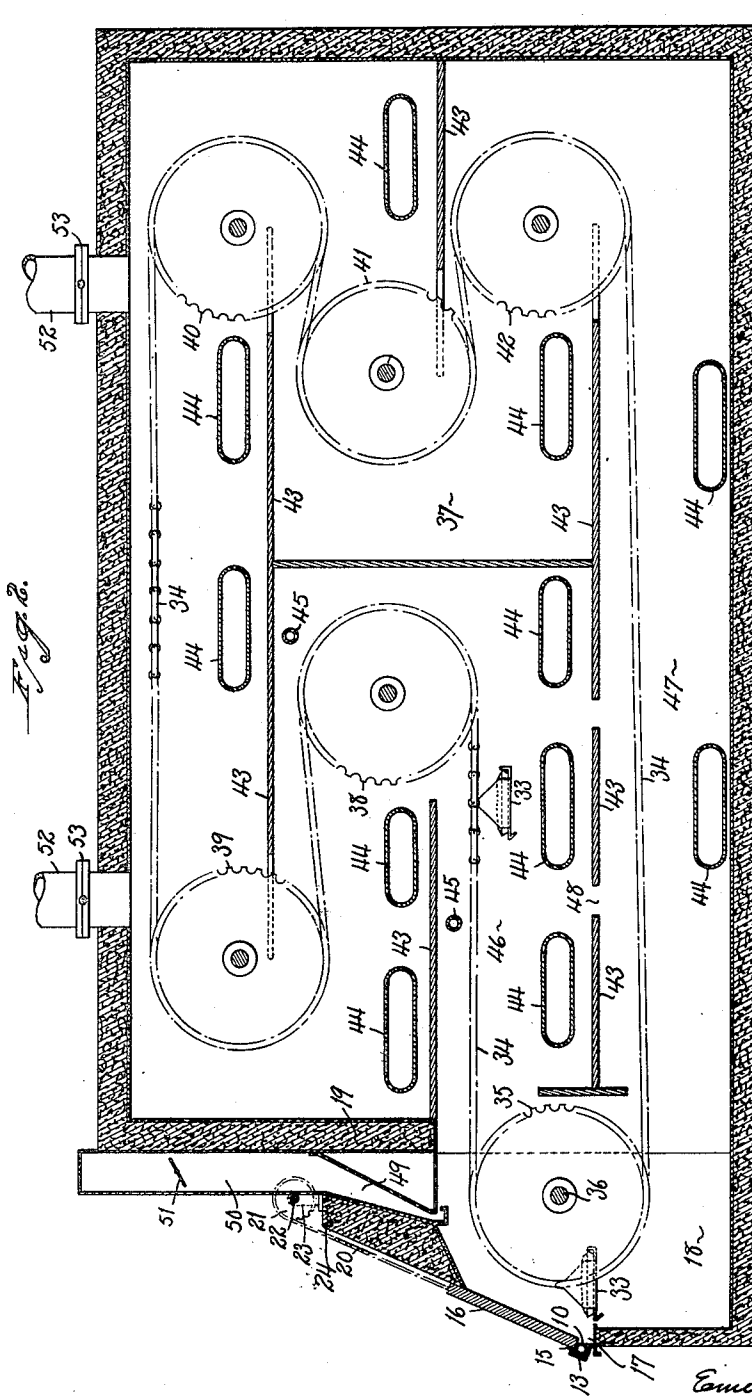
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BAKING OVEN

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UNITED STATES PATENT OFFICE

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BAKING OVEN

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Our invention relates to an improved baking-oven of the type in which provision is made for moistening the exposed surfaces of the dough-units to prevent the formation thereupon of a hard skin or crust until the heat striking from below through the trays has caused the dough to expand to its desired size, the object of our invention being to produce a baking-oven of the type described in which steam is sprayed or jetted at close range directly upon the exposed surfaces of the dough-units on the traveling-trays while the same are located in a vestibule located in front of the oven proper and, therefore, before they are subjected to oven heat, the dough-units in such vestibule being sprayed with a full complement of saturated steam for condensation thereon. Further objects of our invention are to produce a baking-oven constructed with particular reference to compactness of form, ease and economy of operation and baking capacity.

In the accompanying drawings:

Fig. 1 is a view in front elevation of a baking-oven embodying our invention;

Fig. 2 is a view thereof in vertical central section;

Fig. 3 is an enlarged broken sectional view showing our improved vestibule located in front of the oven proper and providing not only for the loading and unloading of the oven products but also for the application to the cool dough of its full complement of moisture before its entrance into the oven proper;

Fig. 4 is a broken view in transverse section on an enlarged scale of the lower edge of the vestibule-door, showing the installation upon it of the steam-pipe from which steam is sprayed at close range directly upon the cool dough; and

Fig. 5 is a detached broken view in front elevation of a section of the steam-pipe showing the perforations therein through which the steam is jetted or sprayed at short range directly upon the cool dough.

In carrying out our invention as herein shown, we install a steam-pipe 10 having a line of perforations 11 horizontally upon a cradle 12 supported upon the bottom of a

housing 13 to which it is secured by screws 14. The said housing is rigidly secured to an angle-iron 15 in turn secured to the outer face of the lower edge of a sliding vestibule-door 16, movable as required, to entirely or partially close the combined charging-and-discharging door-opening 17 in the front wall of a vestibule 18 located in front of the front wall 19 of the baking-oven proper. The said door 16 which, as shown, slides in a plane inclined from the vertical, is suspended from two sprocket-chains 20 having their respective lower ends attached to its upper corners and passing thence upward over two sprocket-wheels 21 mounted upon a horizontal shaft 22 journaled near its ends in bearing-brackets 23 mounted upon the top of the vestibule-hood 24. The upper ends of these respective chains are secured, each by a bolt 25, to a point on the periphery of its complementary sprocket-wheel 21. One end of the shaft 22 is extended and furnished with a sprocket-wheel 26 over which passes an endless chain 27 also passing over a sprocket-wheel 28 on a shaft 29 carrying a worm-gear assembly 30 operated by a hand-wheel 31.

The steam-pipe 10 aforesaid is held in any one of its rotative positions by means, as shown, of a set-screw 54 (Fig. 4) whereby the steam is sprayed upon the dough-units at the angle required by its character, its form and height and its size or bulk. Steam is supplied to the pipe 10 from any source of steam-supply through a flexible pipe 32 which permits the door to be freely raised and lowered as required.

The long trays 33, which may be of any approved construction, are hung by their respective ends upon two conveyor-chains 34 spaced apart and passing over vestibule sprocket-wheels 35 located upon the ends of a shaft 36 journaled at its said ends in the end-walls of the vestibule. The vestibule-sprockets 35 are located so close to the lower edge of the vestibule-door 17 that steam will be jetted or sprayed directly upon the dough-units on the trays 33 at very short range and, therefore, with the maximum of effect.

We wish particularly to point out at this time that by means of our improved construction as above described, we are enabled to apply to each dough-unit all of the moisture required by it in the baking-process before it is subjected to the oven heat and, therefore, at a time when the moisture is applied to the dough to the greatest advantage to it.

From the vestibule 18 in which, while cool, the dough-units are freely sprayed at short range with steam as described, they are carried by the conveyor-chains 34 into the baking-oven proper 37 in which they traverse, as customary in baking-ovens of this type, through a circuitous path established by sprocket-wheels 38, 39, 40, 41 and 42, the arrangement and number of which may be varied according to the size of the oven and the dictation of other circumstances. The said baking-oven 37 is provided with the customary baffles 43 which, in a measure, form a barrier against the escape of heat into the vestibule and, in a measure, permit the control of temperature in the oven. Such baffles form, as it were, a labyrinth of passes for the conveyor-chains 34 and permit at least an approximation of control of temperature in the various passes by retarding the natural tendency of the air in the oven-chamber to seek a level or mean average temperature for the entire chamber, especially when heating-units, such as 44, are located in the various passes and subject to individual control. These baffles are disposed throughout the baking-oven as required to reflect the heat as far as possible upon the bottoms of the trays 33 in their transit through the baking-oven. They may also be used to support the heating-units 44 disposed throughout the baking-oven. These heating-units 44 may be enclosed gas radiators, steam coils, or electric heaters, according to the dictation of circumstances.

In order to keep the temperature, directly over the dough-units, down and so retard the evaporation of the moisture initially deposited upon them in the vestibule, as they enter the baking-oven proper, we by preference employ auxiliary steam-pipes 45. These pipes are formed with perforations for the spraying of saturated steam at a temperature of about 212° F. upon the expanding dough-units and will be disposed as shown or at other places as may be found desirable. It is to be borne in mind that saturated steam at a temperature of 212° F. is very much lower than the average temperature of the baking-oven, which may be from 400° F. upwards and, therefore, the injection of steam upon the top-surfaces of the dough-units in the early stage of the baking process has a relatively cooling effect, retarding the evaporation of the moisture condensed upon

them in the vestibule of the oven, as heretofore described.

In order to provide for the ready interchange of heat between the initial baking-pass 46 and the final baking-pass 47, the lower range of baffles 43 are spaced apart throughout the entire width of the oven to form openings 48 through which heated air may freely circulate from the final baking-pass into the initial baking-pass, thus securing the valuable advantage of a heat interchange from the baked goods, now thoroughly heated and about to be unloaded to the cooler entering dough-units. Such an advantage is made possible by our invention which renders it unnecessary to attempt to confine steam in any portion or pass of the oven proper for the immersion, as it were, of the dough-units in steam after their entrance into the baking-oven. Our oven is constructed on the principle of condensing on each dough-unit a full complement of moisture while it is cool and before it has entered the baking-oven proper.

As shown, the vestibule 18 is furnished with a flue 49 leading into a vent 50 having a damper 51, while the oven proper is provided with vents 52—52 having dampers 53.

In carrying out our invention, the details of construction of its several features may be altered as required by the size and the character of the oven and the character of the baking to be done without, however, departing from its essential character of being provided in front of the oven proper with a vestibule in which the dough-units, while relatively cool, are freely sprayed at short range with steam from suitable means therefor mounted upon the vestibule-door.

It will be understood by those skilled in the art that our invention may assume varied physical forms without departing from our inventive concept, and we, therefore, do not limit ourselves to the specific embodiment herein chosen for illustration, but only as indicated in the appended claims.

We claim:

1. A baking-oven provided with a vestibule located in front of the oven proper, a sliding door for such vestibule, traveling-means passing through the vestibule for the conveyance of dough-units therefrom into the oven, and means installed upon the vestibule-door for spraying steam directly upon the upper surfaces of the dough-units at a point within the said door and closely adjacent thereto.

2. A baking-oven having a vestibule located in front of the oven proper, a sliding door for such vestibule, steam-ejection means installed upon the door and moving therewith, a flexible steam-conductor attached to such steam-ejecting means, and

traveling-means extending into the said vestibule for passing dough-units close to the said steam-ejection means, whereby the dough-units are moistened before their entrance into the oven proper.

3. A baking-oven provided with a vestibule located in front of the oven proper, a sliding vestibule-door movable in its plane, steam-ejection means installed upon the lower end of the door and moving therewith, means for conducting steam to the said steam-ejecting means, and a traveling conveyor passing through the said vestibule in position to expose dough-units carried by it to the action of steam ejected upon them from the said steam-ejecting means.

4. In a baking-oven, the combination with the oven proper, of a vestibule located in front of the same, a sliding vestibule-door, steam-ejecting means installed upon the door in position for the ejection of steam into the vestibule, and a traveling conveyor installed within the oven but entering the vestibule for being charged with dough-units and having its path adjacent to the said steam-ejecting means carried by the door, whereby the dough-units in their travel are directly sprayed with steam at short range before they enter the oven proper.

5. A baking-oven having a sliding door, and spraying-means installed directly thereupon and moving therewith, whereby the position of the spraying-means relative to the character of the dough-units may be regulated by sliding the door.

6. A baking-oven having a vertically movable door, spraying-means installed directly thereupon, and means for vertically moving the said door and consequently the spraying-means, whereby the position of the spraying-means relative to the character of the dough-units may be regulated by moving the door vertically.

In testimony whereof, we have signed this specification.

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