(No Model.) 2 Sheets—Sheet 1.

J. RAYNEY.

REVOLVING REEL BAKE OVEN.

No. 422,629. Patented Mar. 4, 1890.

Fig. 1.

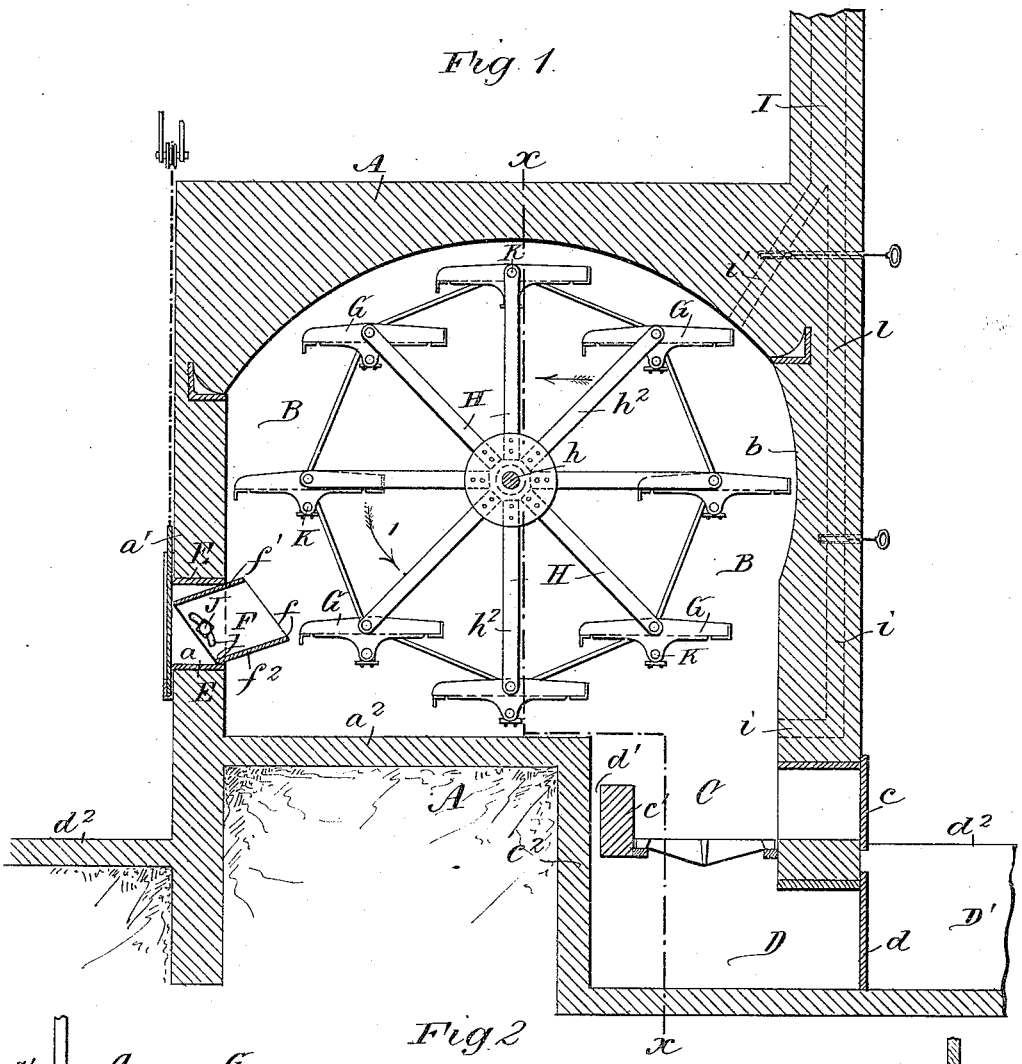


Fig. 2.

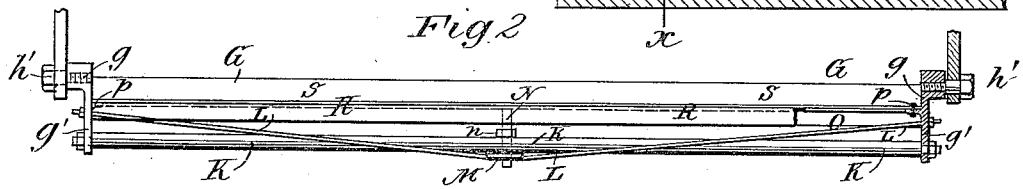
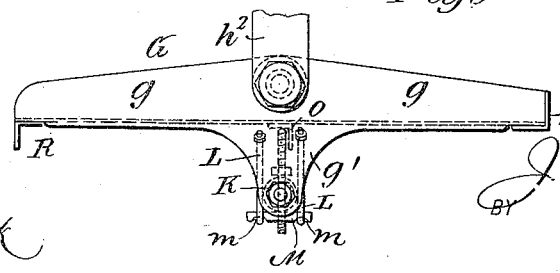


Fig. 3.



WITNESSES:
Paul Jehot
C. Sedgwick

INVENTOR:
J. Rayney
BY
Munn & Co
ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

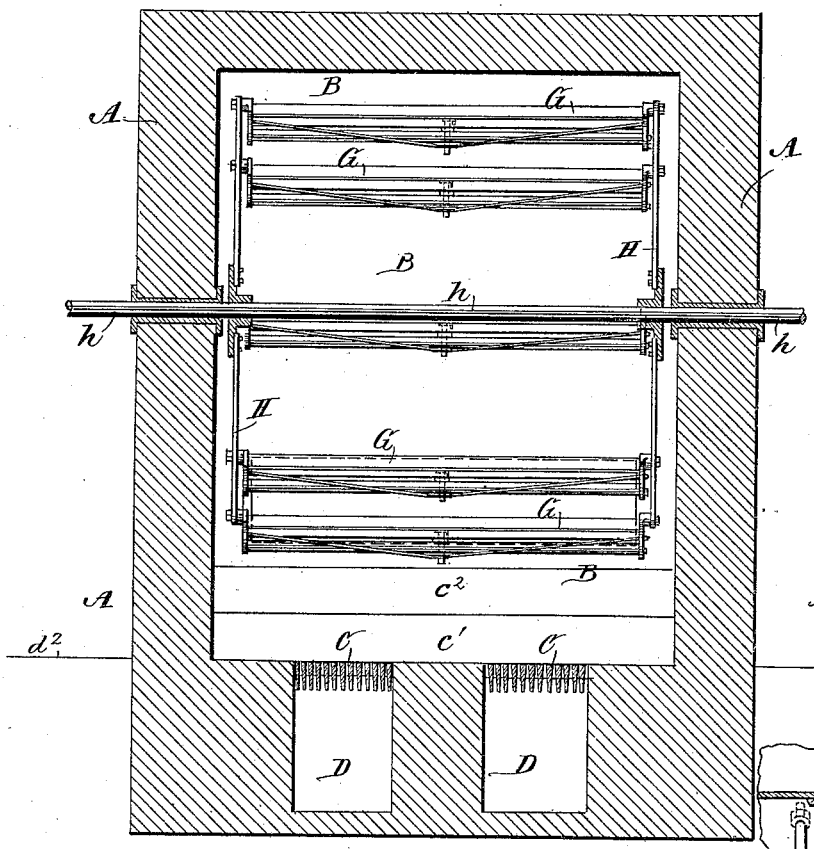
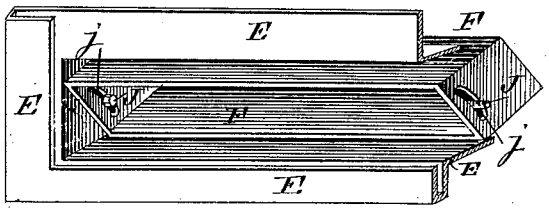


Fig. 5.



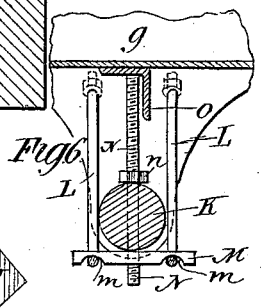


Fig 6.

WITNESSES:

Paul Johes

C. Sedgwick

INVENTOR:

J. Rayney

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN RAYNEY, OF BROOKLYN, NEW YORK.

REVOLVING-REEL BAKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 422,629, dated March 4, 1890.

Application filed October 17, 1889. Serial No. 327,317. (No model.)

To all whom it may concern:

Be it known that I, JOHN RAYNEY, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Revolving-Reel Bake-Oven, of which the following is a full, clear, and exact description.

My invention relates to baking-ovens of the revolving-reel type, and has for its object to provide a more complete, convenient, and efficient oven of this character than has heretofore been constructed.

The invention consists in certain novel features of construction and combinations of parts of the bake-oven, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional side elevation of my improved revolving-reel bake-oven. Fig. 2 is a front view of one of the reel bake-pans partly broken away and in section. Fig. 3 is an end view of the bake-pan drawn to twice the size or scale as Fig. 3. Fig. 4 is a transverse vertical section of the oven, taken on the line x x in Fig. 1, and as viewed from the rear side. Fig. 5 is a front perspective view of the bake-oven opening and its adjustable throat, partly broken away, and Fig. 6 is a detail cross-sectional view of the center portion of one of the bake-pans and its truss bracing devices.

The oven-walls A are built of suitable brick to provide a baking-chamber B, under which at the rear are provided one or more furnaces C, beneath which are ash-pits D, the furnaces and ash-pits being provided with suitable feeding, cleaning, and air-inlet doors c d, respectively, while the baking-chamber is accessible through a front opening a in the brick-work, and to which is fitted an ordinary vertically-sliding door a', having suitable chain or cord and pulley connections for operating it. This door is preferably fitted in guideways formed at the front of a cast-iron jamb E, which is built into the wall and provides the feed-opening a, above named. Into this jamb is fitted an adjustable throat F, through which the crackers, cake, bread, or other substances to be baked are passed onto the pans G of the revolving reel H, which is journaled by a shaft h in the opposite side walls of the oven.

The particular construction and functions of the throat F and reel-pans G will be hereinafter described.

At its back end the furnace C is provided with two bridge-walls, one wall c' being nearer the furnace-door C than the other wall c^2, which is a part of the main walls A of the oven, thereby providing a passage d' for air admitted at the ash-pit door d to pass upward between the two bridge-walls and mingle with the products of combustion from the furnace-fire to force it, and thereby increase the temperature of the lower or bottom part of the baking-chamber at any time required. The walls c' c^2 may practically be a single wall provided with atmospheric-air passages or flues, which would be the full equivalent of the open space or passage d' between the two bridge-walls. It will be noticed that the wall c' is lower than the wall c^2, this proportion being adopted to provide for escape of cinders from the furnace downward through the passage or flue d' to the ash-pit and prevent lodgment of the cinders or ashes or dust onto the floor a^2 of the baking-chamber.

It is not new to arrange a furnace or furnaces at the rear of a revolving-reel bake-oven; but I set the furnace and ash-pit relatively with the oven to allow it to be built and operated successfully in the height of one story or floor of an ordinary building, and this I accomplish by setting the furnace grate-bars about on a level with the bake-house floor d^2, and providing in front of the ash-pit D a hole or excavation D′, in which the furnace-men may stand to care for the fires. The furnace or furnaces obtain draft through a chimney I, into which opens one flue i, leading from the lower rear part of the baking-chamber, and also another flue i', leading from the upper rear part of said chamber, each of these flues being fitted with its own damper, as shown, for controlling exit of smoke or hot gases from either the top or bottom of the baking-chamber at will, and as most clearly shown in Fig. 1 of the drawings.

The vertically-ranging side walls of the oven are built straight at the outside and inside, except at a place b at the inside of the

rear wall, which is concaved outwardly to allow clearance for the edges of the reel bake-pans, while permitting the reel to be journaled farther rearward to bring the pans more fully over the furnace to take more direct advantage of the heat of the fires, which is an important consideration. By thus throwing the bake-pan reel rearward and adopting the more economical straight or plumb construction of the front, rear, and side walls A of the oven, the edges of the pendent bake-pans, as the reel rotates, are brought at some little distance from the feed and discharge opening *a* of the baking-chamber.

To bridge over the space between the front wall of the oven and the edges of the pans is one object of the throat F, which I will now particularly describe. This throat is preferably a box made open at front and rear, and preferably has a rhomboidal cross-sectional form. (Best shown in Fig. 1 of the drawings.) The ends of the throat are held to the jamb E of the oven-opening *a* in a manner allowing the throat to rest by its lower front corner onto the sill of the jamb, while its upper wall preferably rests against the inner top part of the jamb or oven-opening, and so as to allow adjustment of the lower inner edge *f* of the throat as closely as may be to the front edges of the revolving pendent pans. I prefer to hold the throat F in the oven-opening *a* by means of bolts J, passed through curved slots *j* in the ends of the throat into the jamb or wall of the oven, as the bolts thus not only secure the throat in any position to which it may be adjusted, but they also form axial pivots on which to swing the throat into proper position relatively with the front edges of the bake-pans. Any other suitable fastenings for the throat may be provided.

The bake-pan reel will usually be rotated rearward toward the furnace in direction of the arrow 1 in Fig. 1 of the drawings, and it is very desirable that an inwardly-projecting ledge or guard-plate be provided at the side of the oven-front opening toward which the reel turns, to prevent the hot air from being forced too freely out through the feed-opening. When the front wall of the oven is vertical and the throat F is placed in the feed-opening *a*, the inner upper part *f'* of the throat which projects inside the front wall of the oven incidentally forms this ledge or heat-retainer, and the lower inwardly-projecting side f^2 of the throat incidentally forms a lower heat-retainer when the bake-pan reel is rotated in the contrary direction, as may sometimes be desirable; hence the projecting top and bottom parts of the throat F provide heat-retainers in whichever direction the bake-pan reel may be rotated. It will be understood that this inwardly-projecting ledge at one or both edges, or top or bottom of the oven feed-opening *a*, may be plates fixed to the oven-wall to catch and retain the heat which the revolving pans force against and alongside the wall, and which would be forced directly through the opening were these ledges or guard-plates not provided at the opening. By making the throat F also serve as these heat-retaining ledges or guard-plates an economical and advantageous construction is secured.

Revolving-reel-oven bake-pans usually have considerable length and width, and are very liable to sag at the center. My construction seeks more especially to obviate this, while giving the pan a counterbalance-weight which is quite close to the points of suspension of the pan in the reel-arms and extends uniformly along from end to end of the pan, and also forms a part of the trussing or bracing appliances of the pan-bottom.

The construction of my improved pan G is most clearly shown in Figs. 2, 3, and 6 of the drawings. Each end of the pan is formed as a casting *g*, receiving a bolt *h'*, which pivots it to the adjacent radial arm h^2 of the reel H. The two ends of the pan each have a central pendent lug *g'*, and a quite heavy iron shaft K—say of about two inches in diameter, more or less—is fitted into these lugs and ranges along under the center of the pan-bottom and only a short distance from it. This shaft serves chiefly as a counter-weight to keep the pan right side up on its end-pivot supports *h'*, and also forms a substantial endwise brace to the entire pan. As the weight of the shaft is distributed over the entire length of the pan, it is by its use possible to give the pan ample counter-weight at a comparatively short distance from its bottom, thereby economizing room in the depth of the pan.

A couple of truss-rods L L, which are secured at opposite ends by nuts to the opposite ends *g g* of the pan, pass beneath a saddle-plate or casting M, which is laid against the under side and lengthwise center of the counter-weight shaft K. The truss-rods preferably are fitted into grooves *m m* at the under side of the saddle, these grooves being so located as to prevent outward or lateral separation of the rods and hold them snugly to opposite sides of the counter-weight shaft K, as clearly shown in the drawings.

A bolt N, which is preferably passed vertically through the shaft K and saddle-plate M, has an upper threaded end, which normally bears against the upper horizontal portion of a lengthwise-ranging angle-iron O, placed under the pan-bottom P at the center, and receives above the shaft K a nut *n*, which may be screwed down on the bolt against the shaft to force the upper end of the bolt up hard against the angle-iron, and thereby substantially support the center of the pan-bottom P and its middle angle-iron brace O, to prevent sagging of the bottom. The ordinary nuts on the ends of the truss-rods L may also be tightened up at any time to maintain rigidity or stiffness of the central part of the pan.

The ends of the pan-bottom P are fastened

by rivets or otherwise to flanges or lips *p*, which project inward from the opposite end plates or castings *g g* of the pan, which plates project sufficiently above the bottom to form the ends proper of the pan. At its front edge the pan is provided at the bottom with an angle-iron R, which is riveted fast and maintains stiffness of the pan along the front, and at its rear edge or side the pan has another angle-iron brace or stiffener S, the vertical part of which forms the inner or back wall of the pan. The end castings or plates *g g* of the pan are cut away or recessed to allow the angle-iron braces R S to fit them while lying flat upon the lower face of the pan-bottom, as best shown in Fig. 3 of the drawings.

It will be seen that a revolving-reel bake-pan constructed as above described is not only very strong and durable and will not sag, but that it is quite compact or shallow vertically to allow its efficient use on a reel of smaller size for pans of like area or capacity than has heretofore been provided, thereby reducing the height of the entire oven structure to adapt it for more general use in or on one floor of ordinary buildings.

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

1. In a revolving-reel bake-oven, the combination, with the baking-chamber having one opening for feed and discharge of material and a revolving reel in the baking-chamber, of an inwardly-projecting ledge or guard-plate inside of said chamber and at the side or edge of said feed and discharge opening to prevent the revolving reel sweeping the heat too freely from said opening, substantially as herein set forth.

2. In a revolving-reel bake-oven, the combination, with the baking-chamber constructed with a substantially vertical front wall having one opening for both feed and discharge of material, and the reel journaled in said chamber, of a bridge-plate projecting from the lower part of said feed and discharge opening toward the front edges of the reel bake-pans, substantially as herein set forth.

3. In a revolving-reel bake-oven, the combination, with the baking-chamber provided with a feed-opening and the reel journaled in the chamber, of a box-like throat fitted adjustably in said opening and projecting at its lower edge toward the front edges of the reel bake-pans, substantially as herein set forth.

4. In a revolving-reel bake-oven, the combination, with the baking-chamber provided with one opening for both feed and discharge of material and the reel journaled in the chamber, of a box-like throat fitted in said feed and discharge opening and projecting at its top and bottom into the baking-chamber to provide ledges or guard-plates, preventing the revolving-reel bake-pans sweeping the heat too freely from the opening whichever way the reel may be turned, substantially as herein set forth.

5. In a revolving-reel bake-oven, the combination, with the baking-chamber provided with a feed-opening and the reel journaled in the chamber, of a box-like throat F, placed in said opening and provided with end slots, and bolts passed through said slots into the oven-wall, substantially as herein set forth.

6. In a revolving-reel bake-oven, the reel bake-pans having pendent end lugs, combined with a shaft held in said lugs and extending lengthwise of and below the pan-bottom and forming a counter-weight and brace to the pan, substantially as herein set forth.

7. In a revolving-reel bake-oven, the reel bake-pans provided with pendent end lugs, a shaft held therein and extending lengthwise below the pan-bottom and forming a counter-weight and brace, combined with a saddle on said shaft and truss-rods extending across the saddle to opposite ends of the pan, substantially as herein set forth.

8. In a revolving-reel bake-oven, the reel bake-pans made with opposite end lugs, a counter-weight shaft held therein below the pan-bottom, a brace-bar on the bottom above the shaft, and a bolt sustained by the shaft and bearing on the pan-bottom brace-bar, substantially as herein set forth.

9. In a revolving-reel bake-oven, the reel bake-ovens made with end plates or parts extending above the pan-bottom and having pendent lugs, combined with a counter-weight shaft held in the lugs below the pan-bottom, a brace-bar on the bottom above the shaft, a bolt sustained by the shaft and bearing on the pan-bottom brace-bar, and an angle-iron ranging along the rear edge of the pan and forming its rear wall, substantially as herein set forth.

10. In a revolving-reel bake-oven, the reel bake-pans constructed with a bottom P, ends *g g*, projecting above the bottom, and having pendent lugs *g′ g′*, combined with a counter-weight shaft K, held in said lugs, a saddle M next the shaft, truss-rods L L, connected to the ends *g g* and drawing over the saddle, and a rear angle-iron brace-bar S, forming the rear wall of the bake-pan, substantially as herein set forth.

11. In a revolving-reel bake-oven, the reel bake-pans constructed with a bottom P, ends *g g*, projecting above the bottom, and having pendent lugs *g′ g′*, combined with a counterweighted shaft K, held in said lugs, a saddle M next the shaft, truss-rods L L, connected to the ends *g g* and drawing over the saddle, a bolt N, having a nut *n* and sustained by the shaft, a brace-bar O at the pan-bottom, to which the bolt is adapted, and front and rear angle-iron brace-bars R S on the pan, substantially as herein set forth.

JOHN RAYNEY.

Witnesses:
HENRY L. GOODWIN,
C. SEDGWICK.