A. W. MOYER.

CORE OVEN.

APPLICATION FILED JULY 5, 1912.

1,085,153.

Patented Jan. 27, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

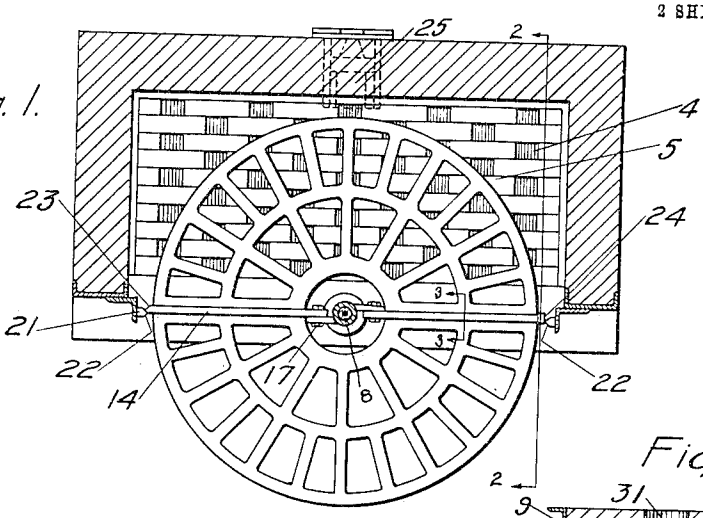


Fig. 2.

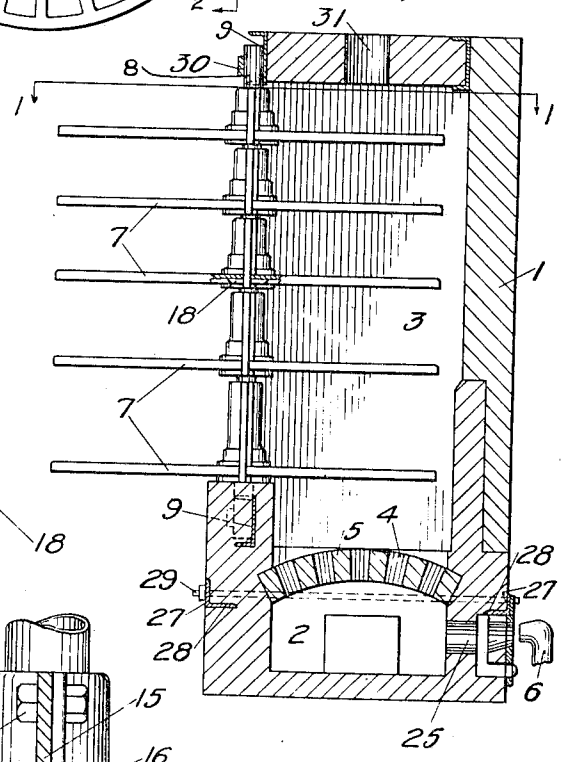


Fig. 4.

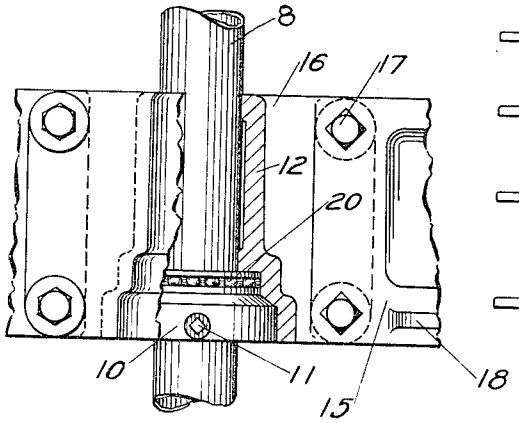
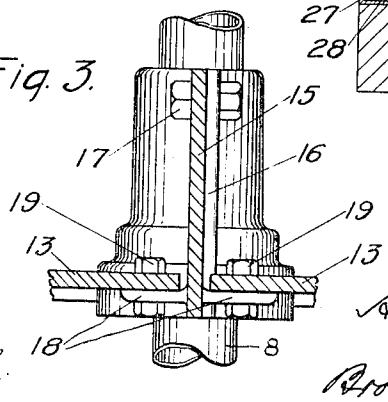


Fig. 3.



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2 SHEETS—SHEET 2.

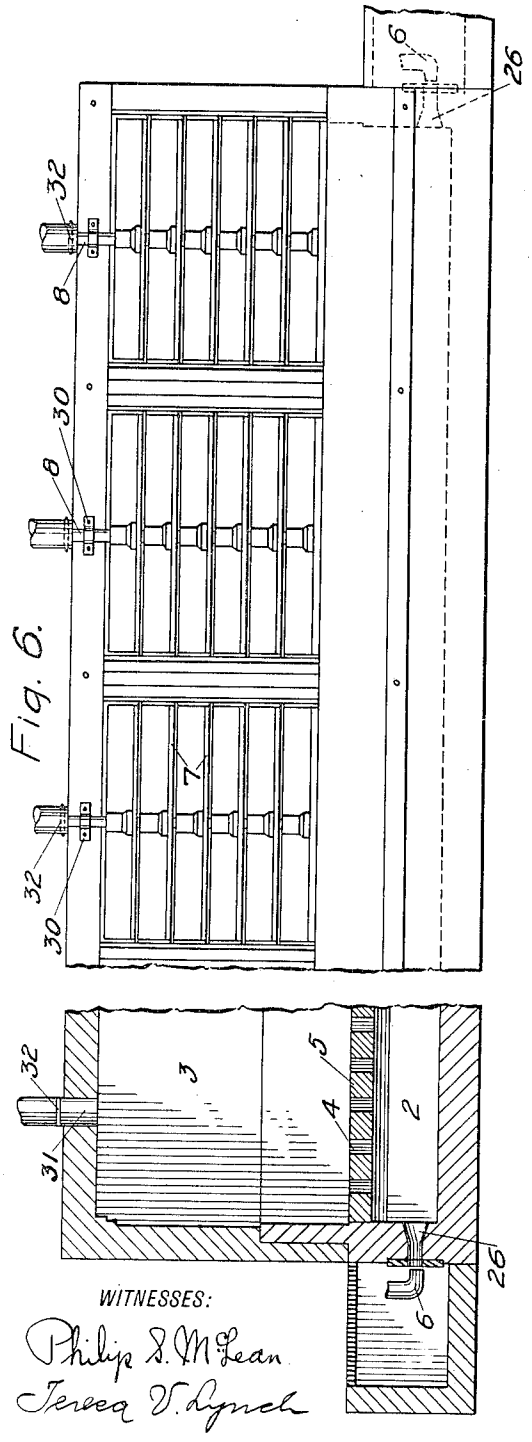


Fig. 6.

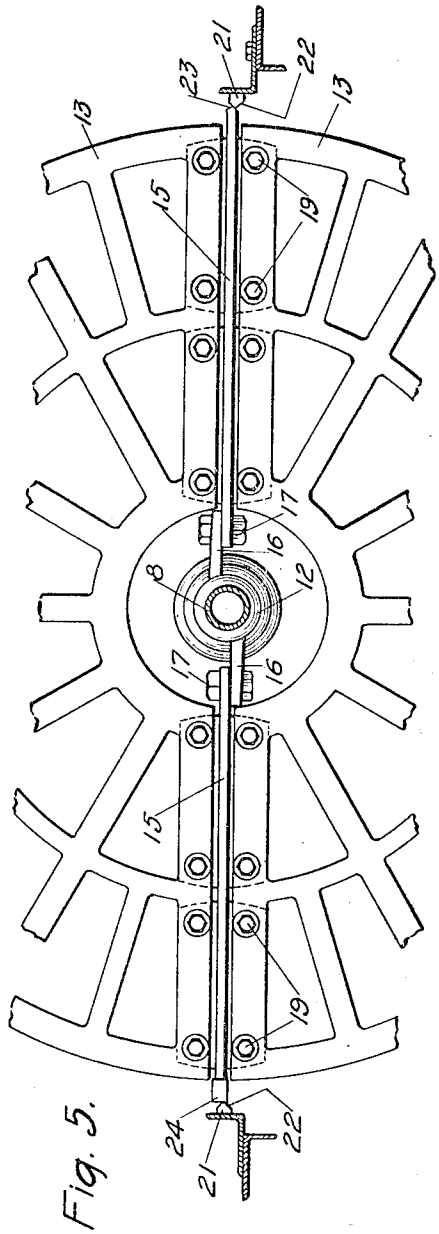


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALBERT W. MOYER, OF NEW YORK, N. Y., ASSIGNOR TO ROCKWELL FURNACE COMPANY, A CORPORATION OF NEW YORK.

CORE-OVEN.

1,085,153. Specification of Letters Patent. Patented Jan. 27, 1914.

Application filed July 5, 1912. Serial No. 707,741.

To all whom it may concern:

Be it known that I, ALBERT W. MOYER, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Core-Ovens, of which the following is a specification.

The furnace of the present invention is what is known as a "core oven," so-called by reason of the fact that it is designed primarily for baking the cores used in foundry work. But while this is its principal use, it will be understood that it may be employed for whatever other purposes found practicable.

The general objects of the invention are to secure a more uniform baking of the cores than it has been possible to obtain heretofore, to obtain a more efficient regulation of the heat, and to prevent waste through loss of heat.

In the accompanying drawings I have illustrated several preferred forms of the invention, but I would have it understood that various modifications may be made without departing from the spirit and scope of the invention.

In the drawings: Figure 1 is a horizontal sectional view of a furnace embodying my invention, this view being taken on line 1—1 of Fig. 2. Fig. 2 is a vertical sectional view of the same taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a detail sectional view of one of the supporting trays, taken on line 3—3 of Fig. 1. Fig. 4 is a broken detail view illustrating a preferred method of mounting the supporting trays. Fig. 5 is a broken plan view of one of the trays. Fig. 6 is a broken view, partly in section and partly in front elevation, of a larger size furnace consisting of a plurality of oven units.

Like reference characters refer to corresponding parts throughout the several views.

In the embodiment illustrated the furnace body 1 is provided with a combustion chamber 2, and a heating chamber or oven 3, the heating chamber being arranged above the combustion chamber and in communication with the same by means of the openings 4 in the arch 5 which separates the two chambers. Any preferred fuel is employed, the heat being supplied in the present instance by a burner 6.

The furnace is charged by placing the cores or other articles to be treated on revolubly supported "reels" or trays which are pivoted partly within and partly without the heating chamber, and then rotating the reels to carry the articles from a point without to a point within the oven chamber. To make the furnace of as great capacity as possible there are preferably provided a number of these trays 7, one superposed above the other, as shown in Fig. 2, and all supported on a common shaft 8. This supporting shaft is relatively fixed, it being held in suitable bearings 9. To permit of any desired length of treatment being given to the articles on the different trays, each tray is made rotatable independently of the other trays. This is accomplished in the present case by mounting the trays loosely on the supporting shaft and providing abutments on which the trays are rotatably supported, the abutment here taking the form of a collar 10, which may be adjustably secured upon the shaft as by means of a set screw 11. The trays, which are substantially circular in shape, as shown in Fig. 1, may be of any desired construction but preferably they are made up of a hub portion 12, which as shown in Fig. 4, is loosely engaged upon the supporting shaft, resting on one of the abutments, and a tray proper which is carried by such hub portion. For reasons of economy of renewal and ease of assemblage, the trays are preferably made in two segmental sections 13, which sections are suitably secured to the hub. To close the opening in the front of the heating chamber or oven, each of the trays carries a closure, shown in a general way at 14 in Fig. 1, the ends of which closures coöperate with the edges of the opening. Specifically these closures preferably consist of transverse partitions 15, which extend radially from the hub section of the tray, they being secured to the wings or fins 16 on the hub, by suitable means, such as bolts 17. The tray sections may be supported direct by these partitions or closures, in which event they are provided with laterally extending flanges 18, on which the tray sections rest and are secured, bolts 19 being preferably employed to removably secure the sections

in place. To minimize the work of rotating the trays, ball, or other like friction-reducing bearings 20 are preferably interposed between the trays and the abutments on which they rest.

To prevent loss of heat at the ends of the closures, a seal of some sort is preferably provided and the same here consists of stops 21 arranged at the edges of the opening in the heating chamber, with which the ends of the closure coöperate. A close joint is provided by making these stops with inwardly facing beveled edges 22 and beveling one end of the closure as at 23 to engage therewith. The other end 24 of the closure is shortened sufficiently so that it will swing past its coöperating stop when the tray is rotated. This arrangement of stops limits the swinging movement of the tray to a half revolution, as will be clear from Figs. 1 and 5, and furthermore a sufficient tight joint is afforded since the closure is in abutting contact with one of the stops at one end and is in approximate or scraping contact with the stop at the other end.

The furnace may be made in a single unit, as in Figs. 1 and 2, or in a plurality of units, as in Fig. 6, the only practical difference being that in the larger sizes, instead of using a single burner discharging in through a burner opening 25 in the back or side of the furnace (Fig. 2), more than one burner is used and these may discharge in through burner openings 26 in opposite ends of the combustion chamber, substantially as indicated in Fig. 6.

A special feature of the invention resides in the use of the perforated arch between the combustion chamber and heating chamber. This serves to temporarily confine the products of combustion within the combustion chamber, thereby insuring complete combustion within such chamber, and it creates an equal distribution of the heat throughout the heating chamber, thereby insuring uniform results. To support this arch and overcome the spreading tendency of the same, I preferably provide angle braces 27 located at opposite sides of the furnace, and having inwardly extending flanges 28 disposed in substantially the center line of the arch so as to receive the thrust of the same. These angle braces may be secured by stay bolts 29.

By increasing or decreasing the distance between the trays, cores (or other articles) of various sizes may be accommodated. For instance, the spacing shown in Fig. 2 permits the handling of large cores on the lower tray and cores of successively smaller sizes on the trays above.

It is evident that by the construction illustrated the trays may be taken apart or assembled while still on the supporting shaft, or the tray may be entirely removed from the shaft. To facilitate such removal the bearings for the supporting shaft may have removable caps 30, so that the shaft may be detached from its bearings and the reels or trays be taken off the shaft.

The waste heat may be allowed to escape from the oven through a vent 31, and this may be controlled by a suitable damper 32, as in Fig. 6.

What is claimed, is:

1. In a furnace of the character set forth, a combustion chamber, a heating chamber in communication therewith, said heating chamber having an opening in one side, a revolubly supported tray mounted to swing through the opening into the heating chamber, a closure carried by the tray, and stops located at the edges of the opening in the heating chamber provided with inwardly facing beveled edges, the closure aforesaid having one of its ends beveled to engage with the beveled surface of either of the stops and having its opposite end shortened to swing past the stop when the tray is rotated.

2. In a furnace of the character set forth, a heating chamber provided with an opening in one side thereof, a combustion chamber in communication with the heating chamber, a substantially circular supporting tray pivoted on an axis substantially in line with the open side of the heating chamber so as swing through said opening into the heating chamber, a closure carried by the tray extending substantially diametrically across the same, stops at the edges of the opening in the heating chamber provided with inwardly facing beveled edges, the closure aforesaid having one of its ends beveled to engage with either of the beveled stops and its other end shortened to swing past the stop when the tray is rotated.

3. In a furnace of the character set forth, a heating chamber provided with an opening in the front thereof, a combustion chamber in communication with the heating chamber, a fixed supporting shaft mounted in the open side of the heating chamber, a series of supporting collars adjustably engaged on the shaft, a series of superposed supporting trays mounted on the shaft resting on the supporting collars and independently rotatable thereon, closures carried by the trays, and stops at the edges of the opening in the heating chamber arranged to coöperate with the ends of the closures to seal the opening in the heating chamber.

4. In a furnace of the character set forth, a combustion chamber, a heating chamber above the combustion chamber provided with an opening in the front thereof, a burner discharging into the combustion chamber, an arch between the combustion chamber and heating chamber provided with openings therein to distribute and equalize the heat arising from the combus-

tion chamber into the heating chamber, a plurality of independently rotatable superposed supporting trays mounted to swing through the opening into the heating chamber, and closures carried by the trays arranged to close the opening in the front of the heating chamber.

5. In a furnace of the character set forth, a heating chamber provided with an open front side, a combustion chamber in communication with the heating chamber, a relatively fixed shaft mounted in the open front side of the heating chamber, collars adjustably engaged on said shaft, supporting trays independently rotatable on the shaft and supported on the collars aforesaid, ball bearings interposed between the collars and supporting trays, and closures carried by the trays arranged to close the open front side of the heating chamber.

6. In a furnace of the character set forth, a heating chamber provided with an open front side, a relatively fixed shaft mounted in the open side of the heating chamber, abutments on said shaft, hubs rotatably engaged on the shaft and supported on the said abutments, ball bearings interposed between the hubs and the abutments, radial partitions secured to the hubs arranged to form closures to the open side of the heating chamber, lateral supporting flanges on said partitions, and segmental tray sections resting on said flanges and secured thereto.

7. In a furnace of the character set forth, a furnace body provided with a combustion chamber and a heating chamber above the combustion chamber, an arch between the combustion chamber and heating chamber provided with openings therein, and angle braces embedded in the sides of the furnace body having inwardly projecting flanges disposed substantially in line with the center line of the arch so as to receive the thrust of the arch.

8. In a core oven, the combination of a combustion chamber and a burner discharging into said combustion chamber, a heating chamber located directly above the combustion chamber and provided with an opening in one side thereof, an arch between the combustion chamber and heating chamber provided with openings therein to distribute and equalize the heat rising from the combustion chamber into the heating chamber, a supporting shaft mounted in the opening in the heating chamber, collars on the said supporting shaft, trays journaled upon the shaft and resting upon said collars, closures carried by the said trays, and stops located at the edges of the opening in the heating chamber and arranged to coöperate with the closures carried by the trays.

9. In a core oven, the combination of a combustion chamber, a burner discharging into the combustion chamber, a heating chamber above the combustion chamber provided with an opening in one side thereof, an arch between the combustion and heating chambers provided with openings therein to distribute and equalize the heat rising from the combustion chamber into the heating chamber, a supporting shaft mounted in the opening in the heating chamber, collars on the said supporting shaft, supporting trays independently rotatable on the shaft and supported on the said collars, ball bearings interposed between the collars and supporting trays, and closures carried by the trays arranged to close the opening in the heating chamber.

10. In a core oven, the combination of a combustion chamber, a burner discharging into the combustion chamber, a heating chamber above the combustion chamber provided with an opening in one side thereof, an arch between the combustion chamber and heating chamber provided with openings therein to distribute and equalize the heat rising from the combustion chamber into the heating chamber, a supporting shaft mounted in the opening in the heating chamber, independently rotatable trays engaged on the said supporting shaft, closures carried by the said trays, and stops located at the edges of the opening in the heating chamber, said stops and closures having cooperating beveled edges to seal the opening in the heating chamber.

Signed at New York city, in the county of New York and State of New York, this first day of July, A. D. 1912.

ALBERT W. MOYER.

Witnesses:
LAURA E. SMITH,
PHILIP S. MCLEAN.