No. 758,409. PATENTED APR. 26, 1904.

W. J. BREEN.

CORE DRYING OVEN.

APPLICATION FILED AUG. 19, 1903.

NO MODEL. 5 SHEETS—SHEET 1.

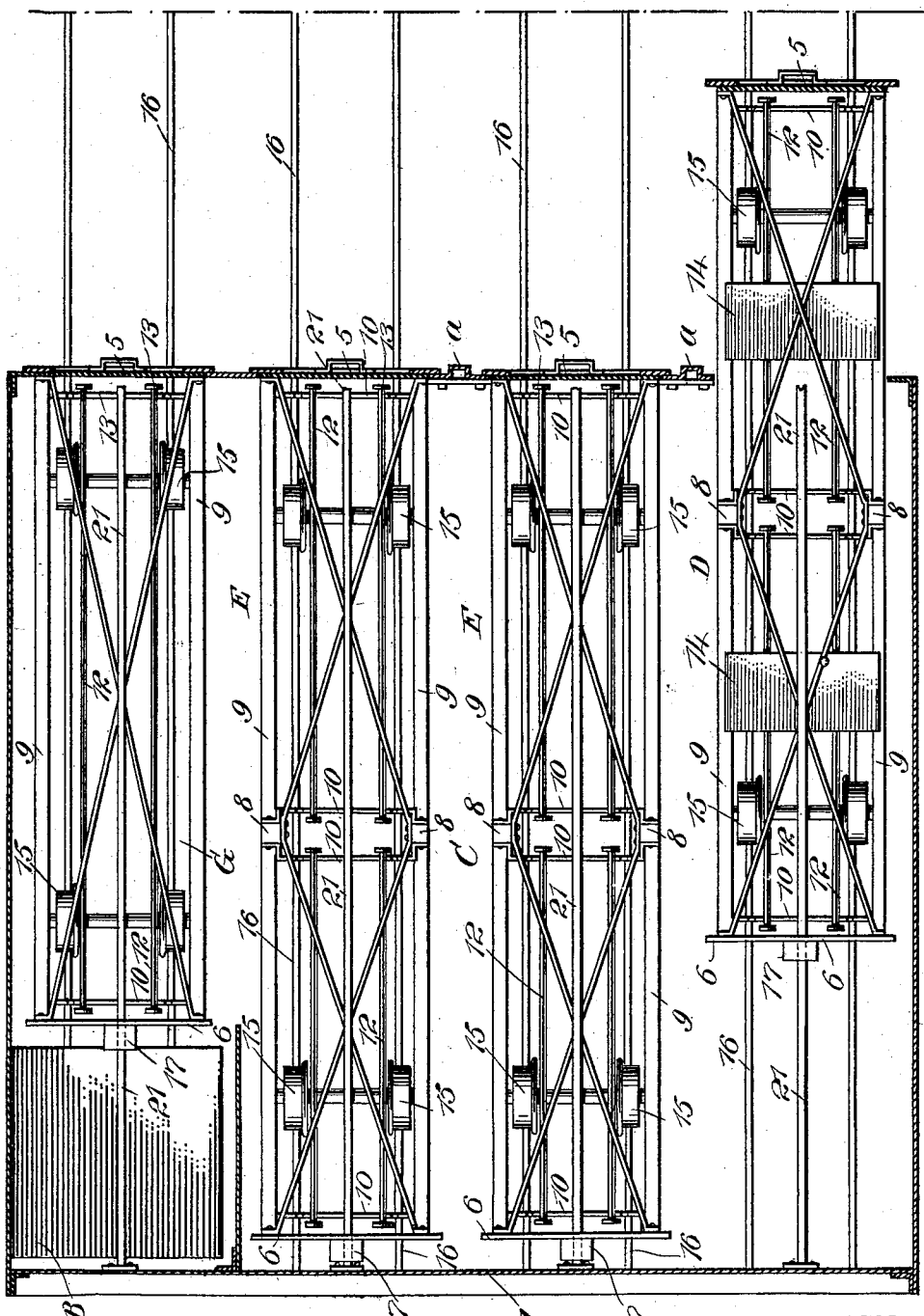


Fig. 1.

WITNESSES:

John A. Supplee

P. J. Bruchaso

INVENTOR

William J. Breen

BY Munn & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

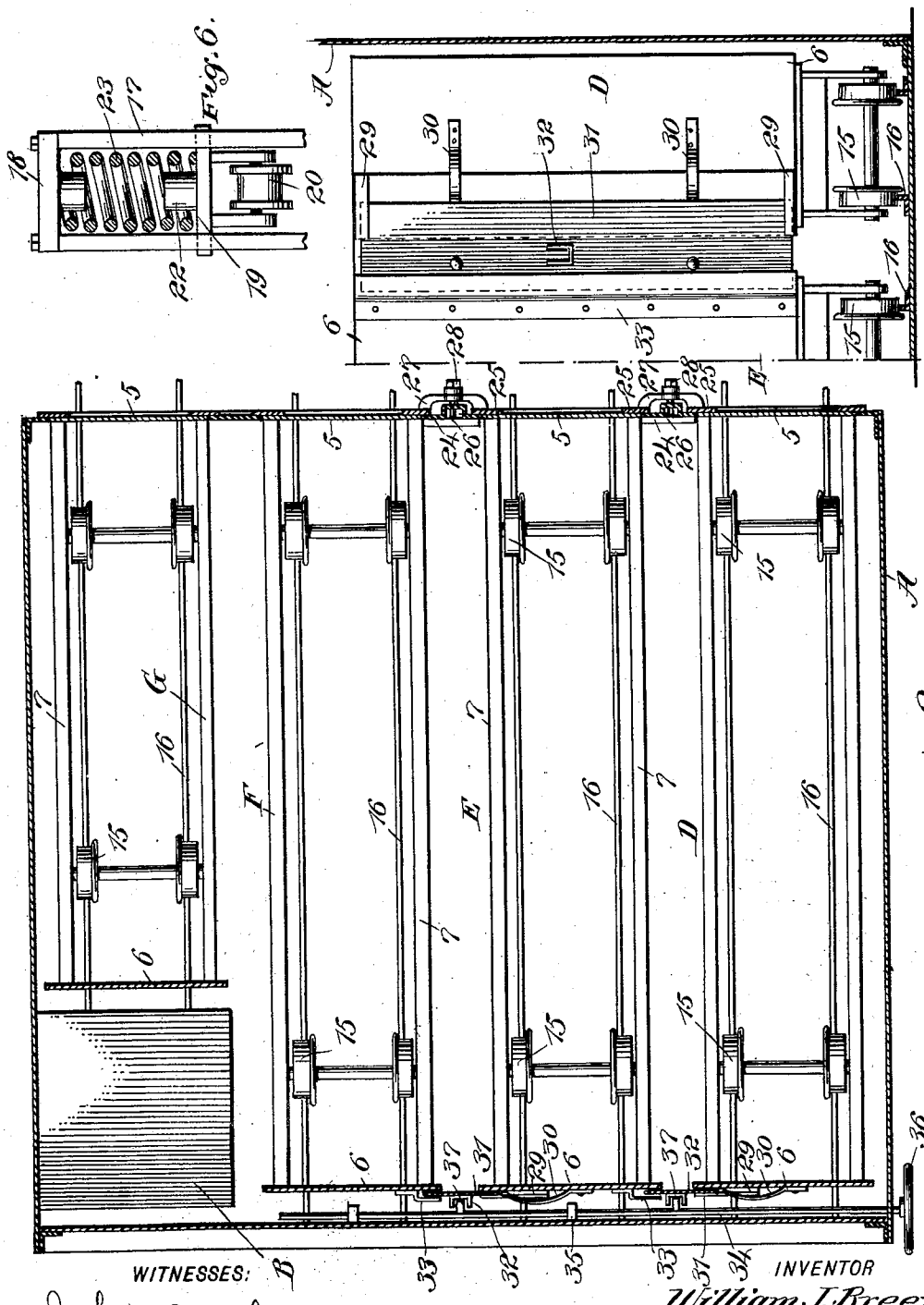
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NO MODEL. 5 SHEETS—SHEET 2.



WITNESSES:

John A. Bergstrom

W. J. Birnhaz

INVENTOR

William J. Breen

BY Munn & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 5 SHEETS—SHEET 3.

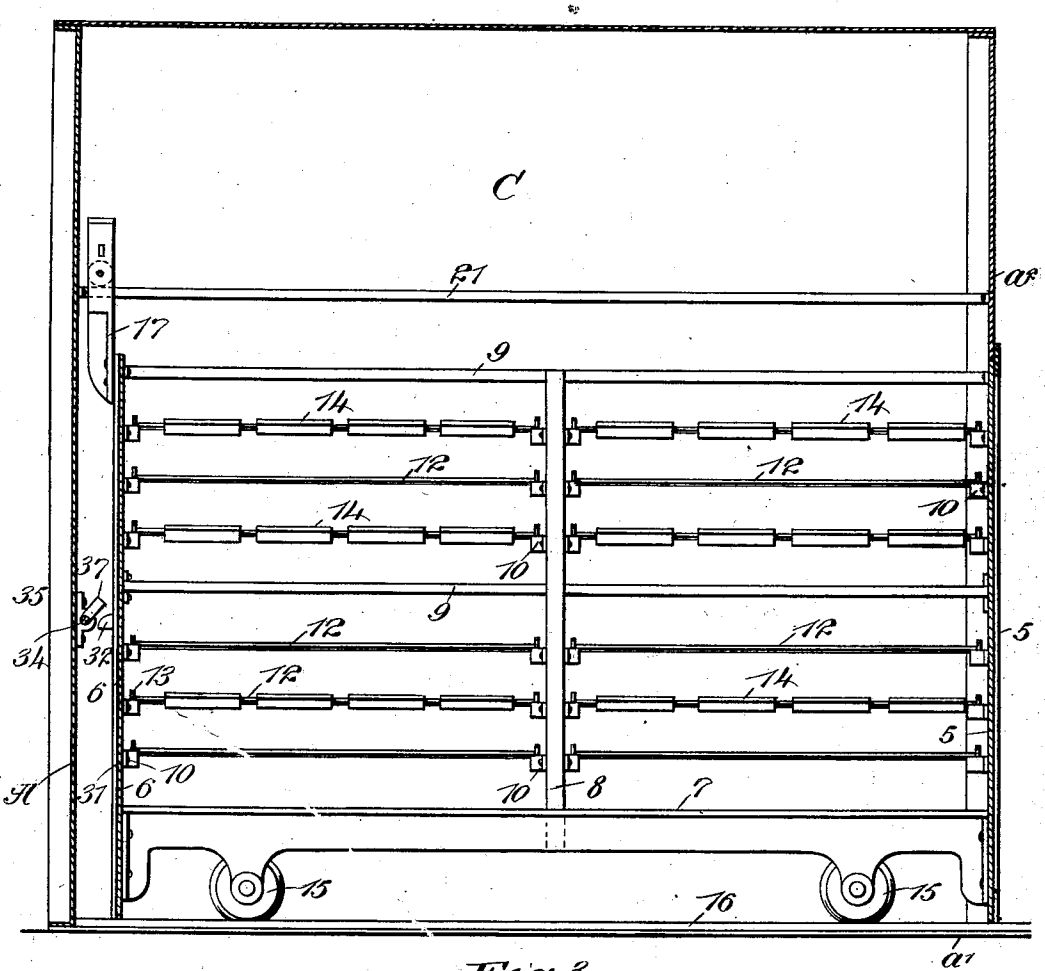


Fig. 3.

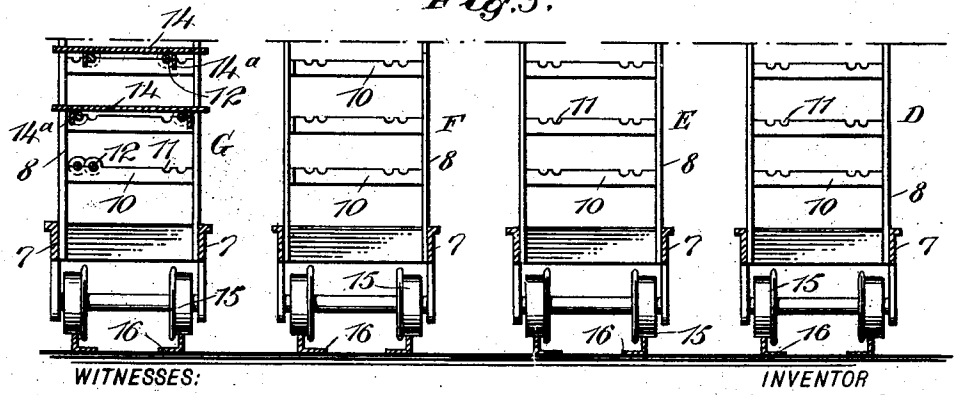


Fig. 4.

WITNESSES:

John A. Brophy

W. J. Bemhagd

INVENTOR

William J. Breen

BY Munn & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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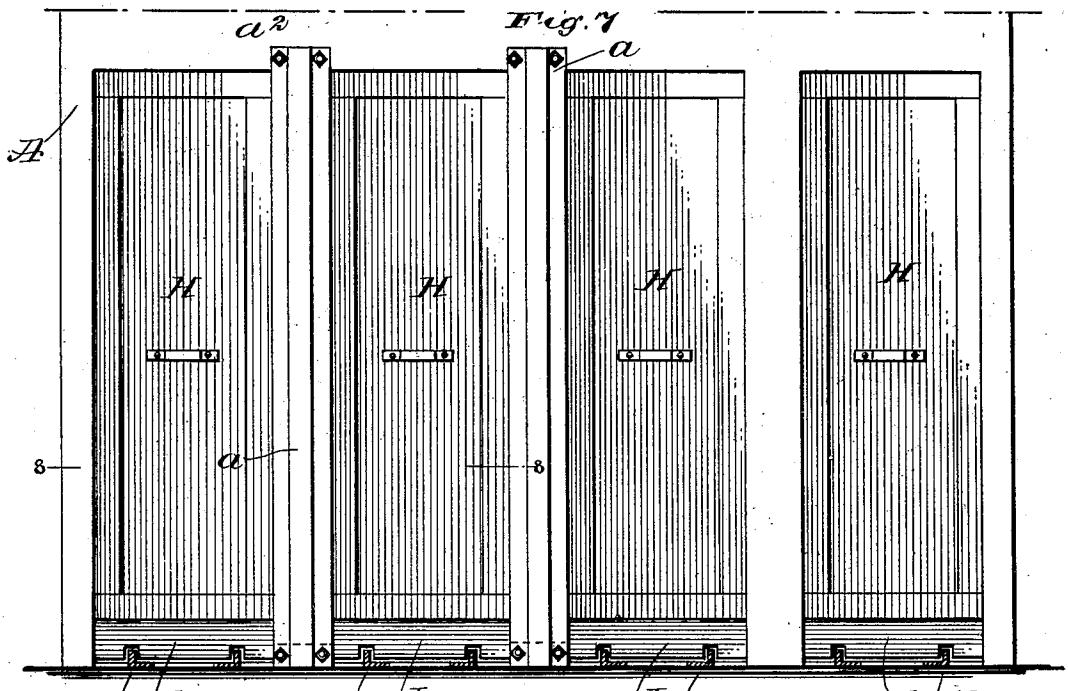
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NO MODEL. 5 SHEETS—SHEET 4.

Fig. 7



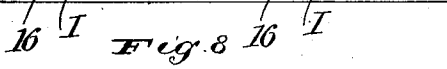


Fig. 8

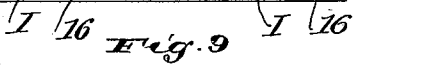
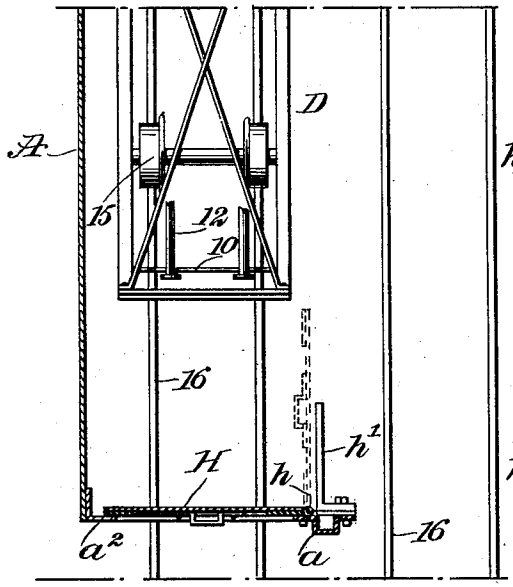
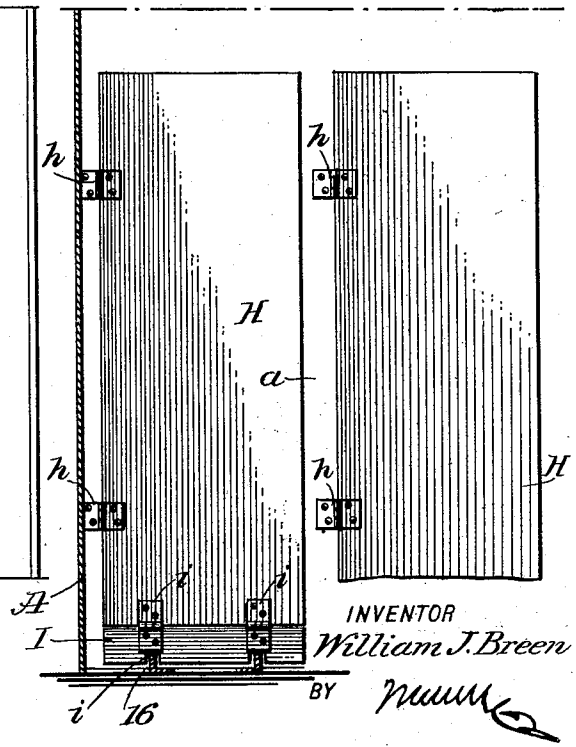


Fig. 9





WITNESSES:

John A. Bergstrom

H. J. Benhaff

INVENTOR

William J. Breen

BY

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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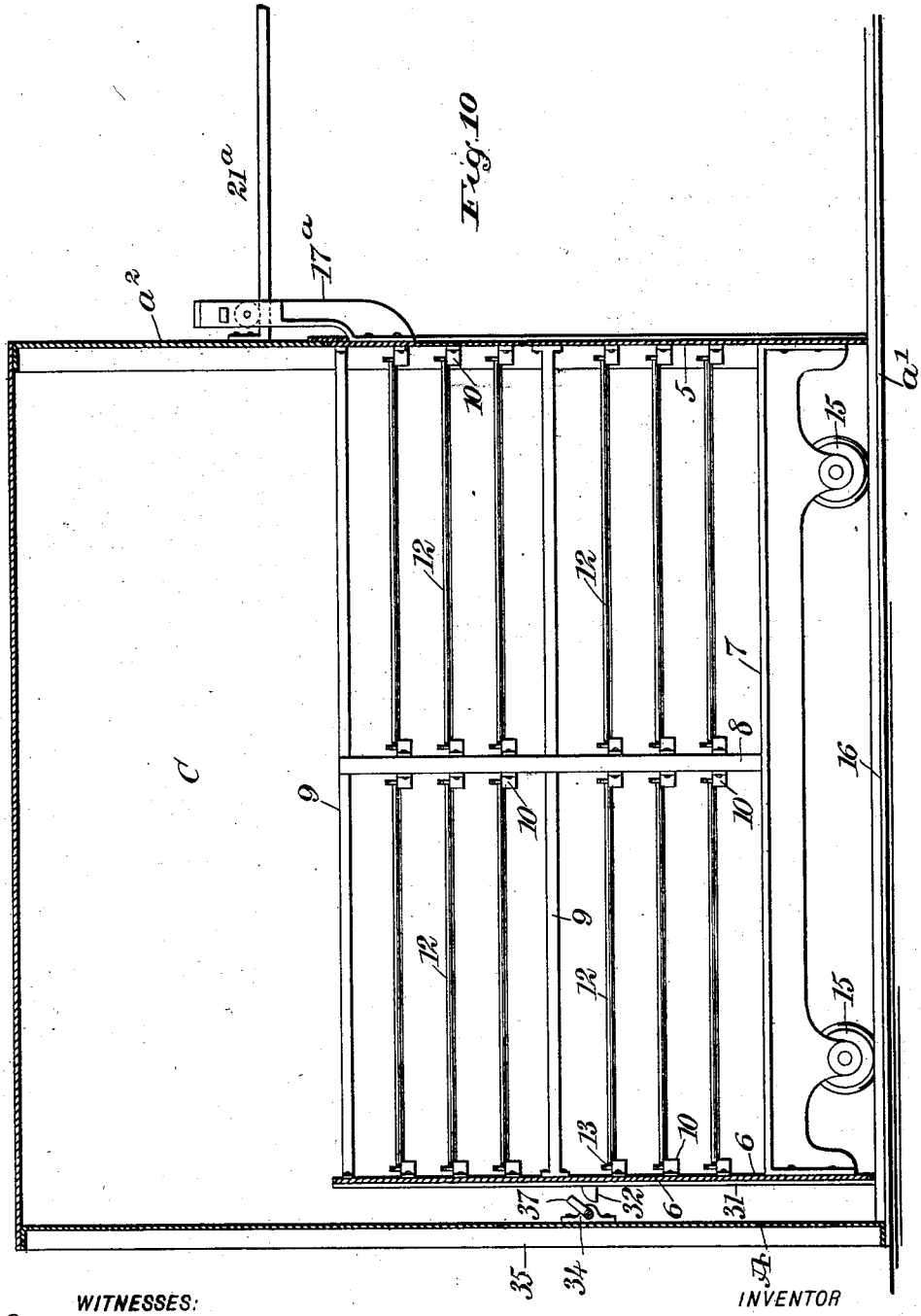
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NO MODEL. 5 SHEETS—SHEET 5.

Fig. 10



WITNESSES:

John A. Brighton

C. E. Holske

INVENTOR

William J. Breen

BY

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITH., WASHINGTON, D. C.

No. 758,409. Patented April 26, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM JOHN BREEN, OF MAHWAH, NEW JERSEY.

CORE-DRYING OVEN.

SPECIFICATION forming part of Letters Patent No. 758,409, dated April 26, 1904.

Application filed August 19, 1903. Serial No. 170,002. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JOHN BREEN, a citizen of the United States, and a resident of Mahwah, in the county of Bergen and State of New Jersey, have invented a new and Improved Core-Drying Oven, of which the following is a full, clear, and exact description.

My invention relates to improvements in ovens for drying cores used in foundry operations; and the primary object that I have in view is the provision of a construction by which a large number of small or medium-sized "green" cores may be handled without injury or breakage during the operations of placing them in the oven, drying the cores, and removing the same from the oven.

A further object is to make provision for handling cores of large size with ease and facility and without injury thereto during the drying operation.

A further object is to provide novel means for supporting the movable drying-racks individually or collectively, as desired.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

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

Figure 1 is a horizontal sectional plan view through a core-drying oven constructed in accordance with my invention and illustrating one of the core-drying racks partially withdrawn from the heating-chamber of the oven structure. Fig. 2 is a sectional plan view somewhat similar to Fig. 1, but showing all of the core-drying racks operatively connected for simultaneous traveling movement with respect to the heating-chamber of the oven, this adaptation of the racks being especially desirable for the purpose of drying cores of very large size. Fig. 3 is a longitudinal sectional elevation through the oven structure and showing one of the core-drying racks in elevation. Fig. 4 is a vertical transverse section through a plurality of core-drying racks, the oven structure being omitted. Fig. 5 is a detail rear end elevation of two of the core-drying racks, illustrating means whereby said racks may be coupled so as to move collectively. Fig. 6 is a detail fragmentary elevation of a trolley adapted to guide or direct a rack in its traversing movement with relation to the oven structure. Fig. 7 is a front elevation of the oven, showing another embodiment of means by which the door-openings in the oven-front may be closed. Fig. 8 is a sectional plan view through a portion of the oven structure, illustrating the hinged doors shown by Fig. 7, the plane of the section being indicated by the dotted line 8 8 of said Fig. 7. Fig. 9 is a vertical transverse section taken through the oven structure on looking toward the front portion thereof, showing the doors on the inside of the oven-front. Fig. 10 is a detail view of a modification wherein the trolley and its track are arranged outside of the oven.

A designates a closed oven structure which may be built of any suitable material and of any desired dimensions. This oven structure is provided with an oven-chamber B, adapted to be equipped with a fire-grate and with other appliances for maintaining combustion therein, said oven-chamber being located in one corner of the oven structure, although the particular location of the oven-chamber is immaterial. The oven-chamber has direct communication with the heating-chamber C of the oven structure, and the front wall of this oven structure is provided with a plurality of removable narrow partitions *a*. (Shown more clearly by Fig. 1.) Said partitions are secured removably in place to the floor *a'* and the permanent front a^2 by any suitable means, so that the partitions *a* may be disconnected when it is desired to couple two or more of the drying-racks for movement collectively, as in the case of a large core which it is desired to dry in the heating-chamber C of the oven structure. The removable partitions *a* are spaced or otherwise arranged to form a series of door-openings in the front of the oven structure, and through these door-openings are adapted to be withdrawn the series of drying-racks D E F G. I may employ any suitable number of drying-racks, although I have shown four of such racks in the drawings forming a part of this specification. The racks D E F are somewhat longer than the

rack G, and this short rack G is mounted for movement toward and from the oven-chamber B, thus utilizing the heating-chamber C to the best advantage.

An important feature of the invention consists in the provision of closure-plates at the front and rear ends of each drying-rack, said plates being indicated at 5 6 in the drawings. The drying-rack is mounted or disposed for endwise slidable movement within the heating-chamber C, and when the rack is moved inwardly, so as to lie within the chamber, the closure-plate 5 of the front of said rack is adapted to have overlapping engagement with the partition *a* for the purpose of closing the door-opening in the front of the oven structure; but when the rack is withdrawn from the heating-chamber the plate 6 at the rear of said rack has abutting engagement with the partitions of the oven-front, thereby closing the oven-chamber when the rack is so withdrawn and minimizing the loss of heat by escapage through the doorway of the oven-front.

Each core-drying rack is of skeletonized construction to allow the circulation of heat to all parts of the rack and the cores or work supported thereon when the rack is inclosed within the heating-chamber, and in the embodiment of the invention shown by the drawings, more particularly by Figs. 3 and 4, the rack is shown as having an open framework, which may be of any desired construction. As shown, however, the framework or rack has base-rails 7, to which are fastened upright side posts 8. The closure-plates 5 6 are also fastened to the base-rails 7, and these plates and the posts 8 are joined by horizontal side bars 9, the several parts being united to produce a strong light structure. The rack is equipped with a series of cross rack-bars 10, which are fastened to the posts 8 and the closure-plates 5 6, and these rack-bars are provided in their upper edges with notches 11, which are adapted to loosely receive the removable rack-bars 12, the latter being shown as having heads 13, which engage with the transverse rack-bars 10 and prevent the endwise displacement of the longitudinal rack-bars 12 on said cross-bars 10.

The longitudinal rods 12 of the rack are arranged in pairs, each rack being equipped with a number of pairs of these rods for the purpose of supporting a number of shelves 14, on which are adapted to be placed the cores which it is desired to dry. As shown more clearly by Figs. 3 and 4 of the drawings, the rack is equipped with tiers of these removable shelves 14, which are adapted to be placed on the pairs of rods, whereby each rack is adapted to carry a large number of small-sized cores; but it is evident that the shelves and the rods 12 may be easily and quickly dismounted from the rack by lifting the shelves off the rods and removing the rods from the cross-bars 10, whereby the skeleton framework of the rack may be used in carrying cores of large size. It is evident that either one of the shelves 14 and the complemental supporting-rods may be removed without disturbing other rods and shelves when it is desired to place larger cores on the rack, and the employment of the rods and shelves allows the rack to be changed in a variety of ways for the accommodation of different sizes and numbers of cores, as may be found necessary in the practical working of the oven system.

The racks of my improved oven are mounted for movement endwise within the heating-chamber C, and any desired means may be employed for guiding the racks in their endwise traveling movement. Each rack of the series is provided with suitable truck-wheels 15, which have their axles journaled in suitable bearings afforded by the base-rails 7 of the rack. The truck-wheels are arranged to ride upon the rails 16 of a horizontal track, said track being fastened to the floor *a* of the oven structure and extending through the doorway for a considerable distance beyond the front of the oven structure, whereby the wheeled rack is adapted to remain on the track when said rack is withdrawn from the oven and is moved endwise with respect to the heating-chamber. I also contemplate the employment of a trolley in connection with each rack as a means for steadying and insuring the traveling movement of the rack in a true path, thus reducing jar and vibration on the cores which are loaded on the rack. Each rack is shown as having an upright guide-yoke 17 attached firmly to the upper part of the rear closure-plate 6. (See Figs. 3 and 6.) The guide-yoke is provided at its upper end with a cross-head 18, and within this yoke is slidably mounted a hanger 19, the same being represented in the form of a plate which is slidably fitted in the sides of the yoke. The hanger is provided with bearings for the accommodation of a grooved trolley-wheel 20, which is arranged to ride upon an elevated trolley-rail 21, the latter being arranged in a horizontal position within the oven-chamber above the rack and secured firmly in place at its end portions to the front and rear walls of the oven structure. The cross-head 18 and the movable hanger 19 are provided with facing-studs 22, which receive the end portions of a coiled pressure-spring 23, one end of said spring being seated against the movable hanger 19 for the purpose of pressing the trolley-wheel 20 upon the elevated trolley-rail 21.

The racks D E F G are adapted to be withdrawn individually from the heating-chamber of the oven structure when it is desired to obtain access to the shelves or either of them for the purpose of removing dried cores from the racks or of placing green cores thereon; but in some cases it is desirable to employ two or more of the racks for the accommodation of cores of large size. Any suitable means may be

employed for coupling the series of racks D E or D E F for simultaneous movement, and when these racks are employed for conjoint operation the partitions *a* are removed from the front of the oven structure. The spaces between the closure-plates 5 at the front of the series of racks D E F are adapted to be closed by the employment of filling-plates 24, which are arranged in alinement with the closure-plates 5 of the racks and are adapted to be fastened in place to said racks by the employment of clamping devices. These clamping devices consist of plates 25 26, yokes 27, and bolts 28. The plates 25 are fastened to the front side of the closure-plates 5 of the racks, whereas the filling-plates 24 are disposed to have abutting engagement with said plates 25 and the closure-plates 5, as shown by Fig. 2. The bolts 28 are fastened to the inside plates 26, which overlap the filling-plates 24, and the yokes 27 bear against the outside plates 25 in positions to receive the bolts 28, whereby the nuts of the bolts are adapted to clamp the several parts firmly to the closure-plates 5, and thus the front ends of the series of racks are coupled for joint movement. I also provide devices whereby the rear ends of the racks are adapted to be coupled when it is desired to have said racks operate conjointly, and in Figs. 2 and 5 of the drawings I have shown one embodiment of means for accomplishing this end. The closure-plates 6 at the rear ends of the racks are provided with guides 29 and with springs 30. In the guides are slidably fitted the upper and lower edges of vertical coupling-plates 31, which are adapted to be confined in their retracted positions by the pressure of the springs 30. These coupling-plates are slidable in the guides 29, and they are provided with sockets 32. Said coupling-plates when projected beyond the edges of the closure-plates 6 of the racks are adapted to be received in suitable keepers 33, which are fastened to the closure-plates of the racks E F, whereby the coupling-plates are operatively connected with the racks by the guides 29 and the keepers 33. As a means for adjusting the coupling-plates I have shown the horizontal rod 34, which is mounted for slidable and turning movement in fixed guide-lugs 35, the latter being secured to the rear wall of the oven-closure. One end of this rod is provided with a suitable operating device, such as a lever or as the hand-wheel 36, (shown by Fig. 2,) and this rod is provided also with fingers 37, which project from said rod and are adapted for engagement with the sockets 32. When it is desired to adjust the coupling-plates 31 into engagement with the keepers 33, the rod 34 is turned for its fingers to enter the sockets 32, after which the rod is moved endwise, so as to shift the coupling-plates 31 in the guides 29 and make them enter the keepers 33, as shown by Fig. 2. The racks are now coupled at their front and rear ends for endwise movement simultaneously within the heating-chamber C, thus allowing a single rack of large capacity to be withdrawn from the oven-chamber for the purpose of receiving a large-sized core, which can be moved into the oven-chamber along with the rack for the purpose of drying said core.

If it is desired to disengage the coupling-plates 31 from certain of the racks when they lie within the oven-chamber, the rod 35 should be manipulated in a way for its fingers 37 to again engage with the sockets 32, and by pulling the rod in an outward direction the coupling-plates may be withdrawn into the guides 29 of the racks D E and free from engagement with the keepers 33 on the racks D F, as will be readily understood by reference to Fig. 2.

Instead of employing closure-plates on the front rear ends of each slidable rack for the purpose of closing the door-openings in the front of the oven structure I may employ the means shown by Figs. 7, 8, and 9 for this purpose. The front of the oven structure is provided with the usual door-openings, the same being separated one from the other by the employment of the partition *a*, the latter being secured removably in place by bolting such partitions to the permanent part of the oven-front and to the floor thereof or in any equivalent way. The door-openings are adapted to be closed by means of doors H, the same being arranged on the inside of the oven-front and hinged, as at *h*, to the removable partition *a* thereof. The doors are adapted to be closed by moving them in outward directions in order that they may overlap the partitions and the permanent part of the oven-front; but when it is desired to adjust or withdraw either of the slidable racks the door *h* is shifted inwardly to occupy the position indicated by dotted lines in Fig. 8, the inward movement of the said door being arrested by any suitable form of stop device—such, for instance, as a horizontal iron *h'*. Of course sufficient clearance should be provided between the doors and the rack for the latter to have inward swinging motion, as shown by dotted lines in said Fig. 8. The doors H preferably terminate at suitable points above the track-rails 16, and to the lower edge of each door is hinged a flap I, the hinges being indicated at *i* in Fig. 9 of the drawings. The flap is adapted to be raised previous to opening the doors in order that it may clear the track-rails 16; but to allow the flap to fold closely to the floor I have shown it provided with notches *i'* in the lower edge thereof, the notched edge of the door receiving the rail 16 of the track.

The arrangement of the trolley which guides the rack in its slidable movement is not material. In Figs. 1 and 3 of the drawings I have shown the trolley-rail and the trolley-arm as being disposed within the chamber of

the oven structure; but under some conditions I prefer to arrange the trolley-rail 21^a on the outside of the oven structure and to apply the trolley-arm 17^a to the front part of the slidable rack, as shown by Fig. 10 of the drawings. This arrangement permits the rack to be guided in its slidable movement with relation to the oven structure, and it also allows switches to be employed in connection with the trolley-rails, whereby the racks may be shifted relatively to the oven structure, so as to pass through one or the other of the series of oven-doors in a manner which will be understood by those skilled in the art. In Fig. 10 the removable shelves 14 have been omitted.

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

1. A core-drying oven having a plurality of independent slidable racks movable side by side within a heating-chamber, and means for coupling said racks for simultaneous movement.

2. A core-drying oven having a heating-chamber, a plurality of racks each slidable side by side within said heating-chamber, means for guiding the racks individually in their sliding movement, and means for coupling certain of said racks for conjoint sliding movement in the heating-chamber.

3. A core-drying oven having a heating-chamber, a plurality of independent wheeled racks each having removable shelves, and means for coupling certain of said racks in side-by-side relation and adapting them for conjoint sliding movement in the oven-chamber.

4. A core-drying oven having a heating-chamber and a removable front, a plurality of traveling racks each provided with means for closing a door-opening on the withdrawal and inward movement of said rack, and means for coupling said racks for conjoint movement within the oven-chamber.

5. A core-drying oven having a heating-chamber, a plurality of slidable racks each having closure-plates disposed for closing the door-opening on the endwise movement of the rack, means for closing the spaces between the front closure-plates of the racks, and means for coupling the racks for conjoint movement in the oven-chamber.

6. A core-drying oven having a heating-chamber, a slidable rack provided at its ends with vertical closure-plates, a trolley-rail, a trolley-arm fixed to one of said closure-plates, and a spring-pressed shoe carried by said trolley-arm and riding on said rail.

7. A core-drying oven having a heating-chamber, a slidable rack, an elevated trolley-rail, a trolley-yoke fixed to the rack, a vertically-movable hanger slidable in said yoke and carrying a shoe which rides on the trolley-rail, and a spring acting to normally press the shoe downwardly on the trolley-rail.

8. A core-drying oven having a heating-chamber, a rack slidably mounted within said chamber, pairs of longitudinal rods mounted in tiers detachably on the rack, and shelves fitted removably on said rods.

9. In a core-drying oven, a rack comprising a frame, cross-bars fixed to said frame, pairs of longitudinal rods mounted shiftably and detachably on the cross-bars, and shelves each confined against displacement on one pair of rods.

10. In a core-drying oven, a rack comprising a skeleton frame, notched bars fixed to said frame, a plurality of rods mounted detachably on said notched bars, and shelves supported removably by said rods.

11. In a core-drying oven, a slidable rack comprising a skeleton frame, cross-bars attached to said frame, longitudinal rods fitted removably to said cross-bars, and shelves supported removably by said rods.

12. In a core-drying oven, a slidable rack comprising a skeleton frame, notched cross-bars secured to said frame, and horizontal rods fitted removably to said notched cross-bars and held against longitudinal movement thereby within the rack-frame.

13. A core-drying oven having a heating-chamber, a plurality of individual racks mounted individually for slidable movement in said heating-chamber, each rack having removable work-supporting devices, and means for coupling certain of said racks for conjoint movement in the heating-chamber.

14. A core-drying oven having a heating-chamber, a plurality of drying-racks mounted independently for slidable movement in said chamber, each rack having removable work-holding devices, end plates carried by each rack for closing the opening of the oven-chamber in which the rack is adapted to slide, means for coupling certain of said racks for conjoint movement in the heating-chamber, and means for closing the spaces between the end plates on the front of the racks when they are coupled for simultaneous movement.

15. A core-drying oven having a heating-chamber, a plurality of individual racks arranged side by side and slidable in said heating-chamber, each rack being provided with removable work-supporting devices, and means for coupling the racks for conjoint movement.

16. A core-drying oven having a heating-chamber, a plurality of individual racks, and means for coupling the racks arranged side by side for conjoint movement.

17. A core-drying oven having a heating-chamber, a plurality of individual racks adapted for slidable movement separately within said oven-chamber, and coupling devices at the front and rear ends of said racks for uniting them for conjoint movement.

18. A core-drying oven having a heating-chamber, a plurality of individual racks disposed for traveling movement therein, each

rack having closure-plates at its respective ends, and coupling devices mounted on said closure-plates and disposed for mutual coöperation in adapting the racks for conjoint movement.

19. A core-drying oven having a heating-chamber, a plurality of racks slidable therein and provided with closure-plates, filling-plates disposed for engagement with the closure-plates at the front ends of the racks, and clamping devices for holding the filling-plates rigidly to said racks.

20. A core-drying oven having a heating-chamber, a plurality of racks movable therein and provided at the rear ends with closure-plates, coupling-plates supported by certain closure-plates of the racks and adapted for engagement with other closure-plates of other racks, and means for operating said coupling-plates.

21. A core-drying oven having a plurality of racks provided with closure-plates, guides on certain of said closure-plates, keepers on other closure-plates, coupling-plates slidable in said guides and adjustable into engagement with the keepers, and means for operating said coupling-plates.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM JOHN BREEN.

Witnesses:

EDWARD BREEN, Jr.,

JOHN SWANBERG.