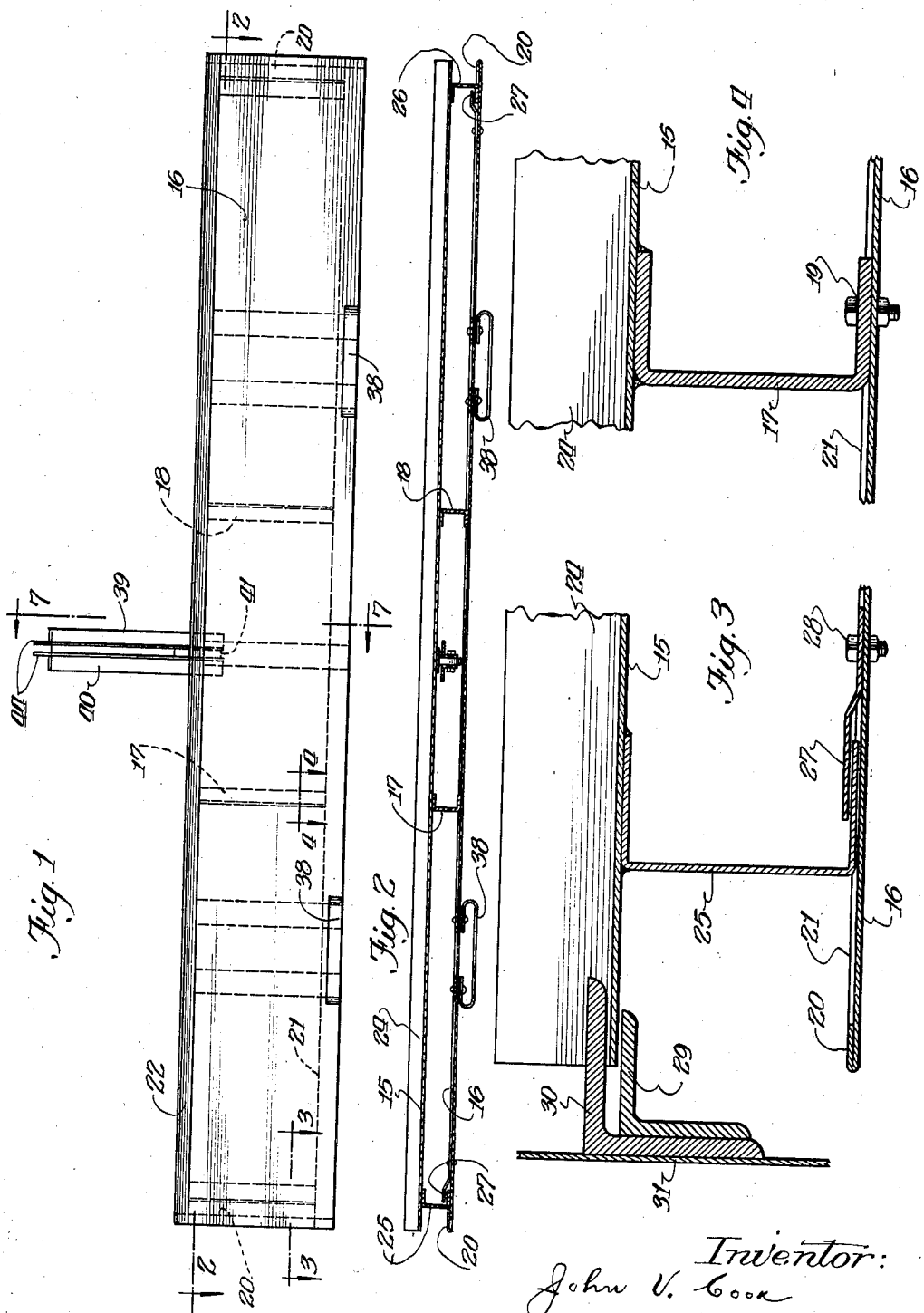
Oct. 10, 1939. J. V. COOK 2,175,954

DOOR FOR BAKING OVENS AND MOUNTING MEANS THEREFOR

Filed March 26, 1938 2 Sheets-Sheet 1



Inventor:
John V. Cook
By: Leslie W. Price
Atty.

Oct. 10, 1939. J. V. COOK 2,175,954

DOOR FOR BAKING OVENS AND MOUNTING MEANS THEREFOR

Filed March 26, 1938 2 Sheets-Sheet 2

Fig. 5

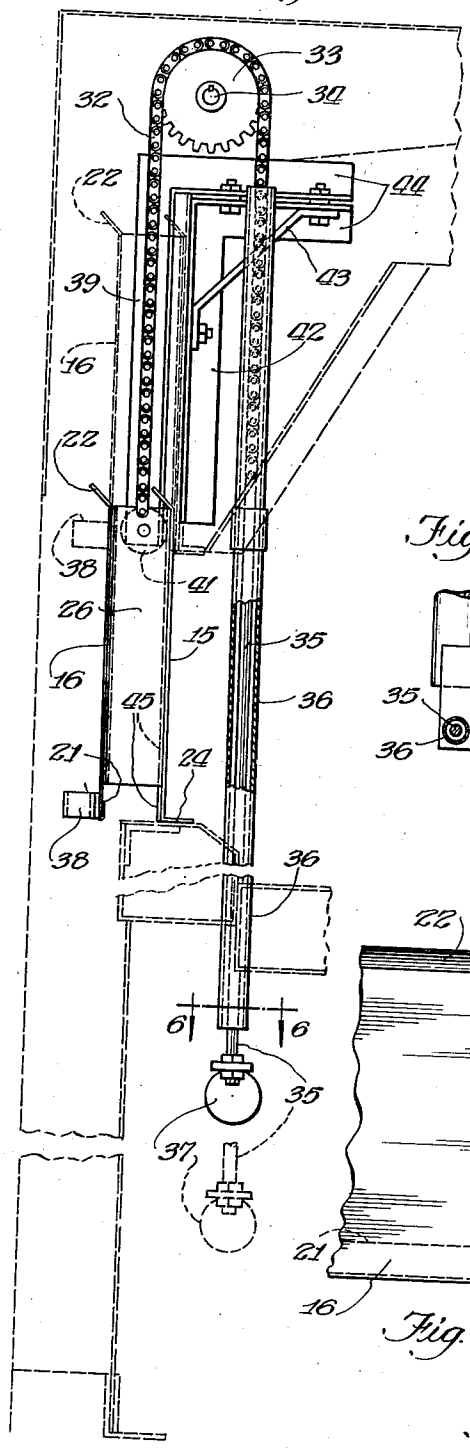
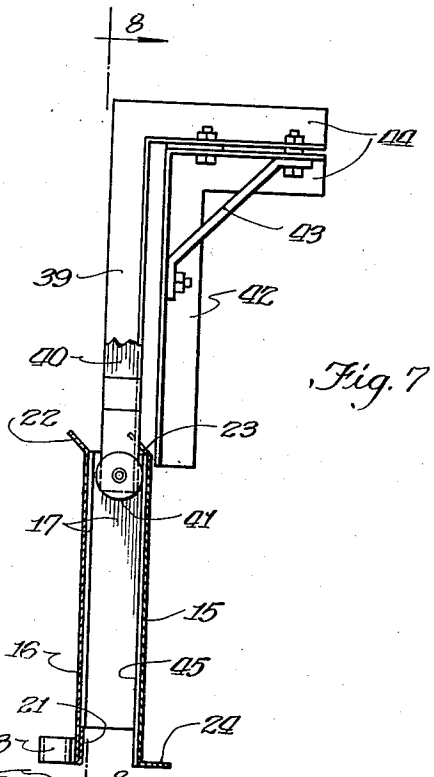


Fig. 6

Fig. 7



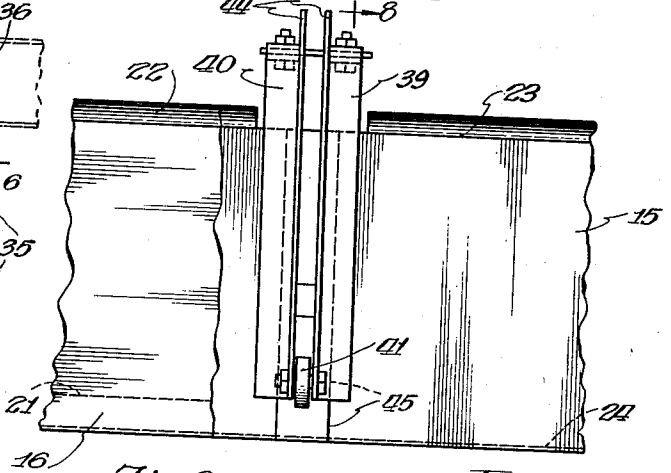


Fig. 8

Inventor:
John V. Cook
By: Leslie W. Frick
Atty.

Patented Oct. 10, 1939

2,175,954

UNITED STATES PATENT OFFICE

2,175,954

DOOR FOR BAKING OVENS AND MOUNTING MEANS THEREFOR

John V. Cook, Chicago, Ill., assignor to The Petersen Oven Company, Chicago, Ill., a corporation of Illinois

Application March 26, 1938, Serial No. 198,297

9 Claims. (Cl. 107—65)

My invention relates to doors for baking ovens and mounting means therefor, and it has for its object the provision of a new and improved form and arrangement of parts in a door and its associated structure whereby the door may be effective as a closure means for preventing the escape of heat from the oven and whereby the door may be operated easily for affording convenient access to the interior of the oven for loading and unloading the oven and for then again closing the door opening. It is one of the objects of my invention to provide an improved arrangement of the door structure whereby the changes in the temperature of the several parts of the door under the varying heat conditions in the use of the oven may take place without any radical change in the shape of the door and without the application of heavy stresses to the structure of the door as a whole by reason of the uneven expansion of the parts of the door. To this end, it is one of the objects of my invention to provide a slide-joint connection between different parts of the door and between the door and the mounting and controlling means for the door.

It is another object of my invention to provide an improved door arrangement by which an improved balancing of the parts is effected so as to enable an operator to open the door by the application of pressure thereon at any point; and to provide an improved arrangement of pressure means for holding the door in operative position with respect to the door frame so as to keep the escape of steam and hot air from the baking chamber to a minimum.

It is another object of my invention to improve devices of this type in sundry details hereinafter pointed out. The preferred means by which I have accomplished my several objects are illustrated in the drawings and are hereinafter specifically described. That which I believe to be new and desire to cover by Letters Patent is set forth in the claims.

In the drawings,

Fig. 1 is a front face view of my improved door, and showing at the middle portion of the door the pressure bars by which the door is held in position against the face of the door frame;

Fig. 2 is a horizontal sectional view taken at the line 2—2 of Fig. 1;

Figs. 3 and 4 are enlarged detail views, being horizontal sectional views taken respectively at the line 3—3 and the line 4—4 of Fig. 1, a portion of the framework of the oven being shown in addition at the left in said Fig. 3;

Fig. 5 is an end view of my improved door and the counterbalancing means at the near end of the door, fragmentary portions of the oven being indicated by dotted lines, and parts of the structure being broken away for clearness of illustration;

Fig. 6 is a horizontal sectional view taken at line 6—6 of Fig. 5;

Fig. 7 is a vertical sectional view taken on an enlarged scale substantially at the line 7—7 of Fig. 1 but with many of the parts omitted; and

Fig. 8 is a view of the middle portion of the door and the pressure bars associated therewith, substantially as seen at the line 8—8 of Fig. 7.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, 15 and 16 indicate two sheet metal plates in spaced relation to each other and connected rigidly together at about their middle portions by channel bars 17 and 18 which are rigidly secured to the plates in spaced relation to each other at about the middle portion of the door longitudinally thereof. In the arrangement shown, the channels 17 and 18 are welded to the plate 15, as shown in Fig. 4 and secured to the plate 16 by means of bolts 19. As is best shown in Figs. 3 and 7 the outer plate 16 is turned backwardly upon itself at its end portions to provide strengthening flanges 20, is turned upwardly along its bottom edge to provide a longitudinally extending strengthening flange 21, and is provided at its upper edge with an obliquely positioned flange 22. The inner plate 15 is provided at its upper edge with an obliquely disposed flange 23, and at its bottom edge with an inwardly disposed flange 24 extending away from the plate 16.

At their end portions, the plates 15 and 16 are yieldingly connected together so as to permit one of the plates to slide longitudinally of the door with respect to the other plate when the plates are unevenly expanded during the time when the furnace is being heated ready for use or under any other circumstances. Such yielding connection at the ends is provided by the use of channels 25 and 26 which are rigidly secured by welding to the inside plate 15 but which have sliding connection with the outside plate 16. In the arrangement shown, the sliding connection is effected by the use of brackets 27 which are rigidly mounted by means of bolts 28 upon the plate 16 in position to receive the free flanges of the channels 25 and 26 between the brackets and the plate 16. The arrangement is such that the brackets by sliding engagement with the

channels 25 and 26 hold the plates 15 and 16 in substantially normally spaced relation to each other while at the same time permitting one of said plates to slide longitudinally with respect to the other plate.

At each end of the door, I have provided two angle bars 29 and 30 in fixed position upon a portion of the wall 31 about the doorway, such angle bars having their free flanges in spaced relation to each other so as to provide deep grooves for the reception of the ends of the inside plate 15 of the door (see Fig. 3). The arrangement is such that ample clearance is provided between the ends of the plate 15 and the bottoms of the grooves so as to accommodate longitudinal expansion of the plates 15.

The means for supporting the door comprising the plates 15 and 16 in position so as to open edgewise upwardly comprises flexible members 32 connected at their ends with the channel bars 25 and 26 respectively and extending over rotary supporting devices 33. In the arrangement shown, the flexible members 32 are in the form of sprocket chains, and the rotary supporting devices 33 are in the form of sprocket wheels, the sprocket wheels 33 at opposite ends of the door being connected together by means of a shaft 34 by which said sprocket wheels are caused to rotate in unison. The sprocket chains 32 are connected in turn with links 35, the chains and links extending downwardly through pipes 36 in suitable position adjacent to the doorway, and said links 35 being connected at their lower ends with a bar 37 which extends across below the door. The arrangement is such that the door 15—16 is substantially counterbalanced by the bar 37 so as to enable the door to be readily raised and lowered by the use of handles 38 on the outer face of the door. The arrangement is such, by reason of the use of a counter-weight in the form of a bar connected with both of the chains 32 and by reason of the fact that the sprocket wheels 33 are connected so as to rotate in unison, that the door can be readily operated by the application of pressure thereon at any point therealong without danger of uneven movement of the door such as would have a tendency to cause it to jam.

The means for holding the door in position in face contact with the frame about the doorway as shown in Fig. 5 comprises two vertically disposed bars 39 and 40 each in the form of an angle bar positioned in spaced relation to each other as shown in Fig. 8 with a roller 41 journaled between their lower ends. The bars 39 and 40 are connected at their upper end portions with angle bars 42 which are vertically arranged opposite the bars 39 and 40 but inside of a portion of the wall of the oven so as to brace the bars 39 and 40 strongly in position. Obliquely disposed brace bars 43 are connected with the bars 42 for strengthening the construction. In the arrangement shown, the bars 39 and 40 are connected with the bars 42 by means of turned upper end portions 44 of the several bars, as is best shown in Fig. 7.

As is clearly shown in Figs. 5 and 7, the roller 41 is in position to apply inward pressure upon the outer face of the inner plate 15 of the door, a wear plate 45 being provided on the face of the plate 15 for engagement with said roller 41. The arrangement is such that the roller 41 by its pressure on the plate 15 holds such plate in snug engagement with the front wall of the oven in the normal closed position of the door, such roller being located opposite the upper edge portion of said plate 15. When the door is moved edgewise upwardly into the position as shown in dotted lines in Fig. 5, the roller serves to maintain the door in engagement with the doorway frame.

By the use of my improved construction in which ample provision is made for the expansion of the parts of the door without causing any considerable distortion of the door structure as a whole, and in which an effectively operating counterbalance is provided for the door so as to prevent any tendency for it to become jammed between the frame parts of the oven, I am assured that my improved door construction shall be effective under any and all normal conditions of use.

While I prefer to employ the form and arrangement of parts as shown in my drawings and as above described, it is to be understood that my invention is not to be limited to the ararngement shown except so far as the claims may be so limited, it being understood that changes in the form and arrangement might well be made without departing from my invention.

I claim:

1. In a door for a baking oven, the combination of two sheet metal plates in spaced relation face to face, means connecting said two plates rigidly together at one point therealong, and means connecting said plates yieldingly together at another point so as to hold the plates in substantially normally spaced relation to each other but so as to permit one plate to slide longitudinally with respect to the other plate.

2. In a door for a baking oven, the combination of two sheet metal plates in spaced relation face to face, means for connecting said two plates rigidly together at an intermediate point longitudinally of the door, and means for connecting said plates yieldingly together at their end portions.

3. In a door for a baking oven, the combination of two sheet metal plates in spaced relation face to face, two bars between said plates and rigidly connected thereto in spaced relation to each other at about the middle portion of the door longitudinally thereof, two other bars between said plates at about their end portions and rigidly connected with one of said plates, and means providing a sliding connection between the other plate and said second named two bars.

4. In a door for a baking oven, the combination of two sheet metal plates in spaced relation face to face, two channel bars between said plates and rigidly connected thereto in spaced relation to each other at about the middle portion of the door longitudinally thereof, two other channel bars between said plates at about their end portions and rigidly connected with one of said plates, and brackets mounted on the other of said plates adjacent to said second named channel bars and having portions in spaced relation to said other plate each in position for sliding reception of the free flange of the adjacent channel for effecting a yielding connection of said plates at said end portions.

5. In a door for a baking oven, the combination of two sheet metal plates each having its top and bottom edge portions bent into angular relation for stiffening the plates longitudinally thereof, means connecting said two plates rigidly together at one point therealong in substantially spaced relation opposite to each other, and means connecting said plates yieldingly together at an-

other point longitudinally of the door so as to hold the plates in substantially normally spaced relation to each other.

6. In a door arrangement for a baking oven, the combination of two sheet metal plates in spaced relation face to face forming the inside and the outside wall portions respectively of the door, said inside wall plate being bent into oblique position extending upwardly and toward the other plate at its upper edge and being bent away from said other plate at its lower edge so as to provide strengthening flanges on said inside plate, said lower flange being adapted by engagement with the wall below the doorway to provide a seat for the door and adapted by engagement with the wall above the doorway to act as a stop for limiting the upward movement of the door, means connecting said two plates rigidly together at one point therealong, and means connecting said plates yieldingly together at another point longitudinally of the door so as to hold the plates in substantially normally spaced relation to each other but so as to permit one plate to slide longitudinally with respect to the other plate.

7. In a door arrangement for a baking oven, the combination of a door adapted to open edgewise upwardly and comprising two sheet metal plates in spaced relation face to face, means rigidly connecting said plates together at about their middle portions, means providing a yielding connection between the plates at about their end portions so as to permit uneven expansion of the plates with a minimum distortion of the door, and an arm mounted at one end on the oven in spaced relation to the face of the oven in position to apply pressure inwardly on the outer face of the inner plate of the door for holding the door in effective closure position and for preventing outward movement of the door during an opening operation.

8. In a door arrangement for a baking oven, the combination of a door adapted to open edgewise upwardly and comprising two sheet metal plates in spaced relation face to face, means rigidly connecting said plates together at about their middle portions, means providing a yielding connection between the plates at about their end portions so as to permit uneven expansion of the plates with a minimum distortion of the door, an arm mounted at one end on the oven in spaced relation to the face of the oven, and a roller mounted on said arm in position to apply pressure inwardly at about the upper edge of the inner plate of the door when the door is closed and to prevent outward movement of the door during an opening operation.

9. In a door arrangement for a baking oven, the combination of a door adapted to open edgewise upwardly and comprising two sheet metal plates in spaced relation face to face, means rigidly connecting said plates together at about their middle portions, means providing a yielding connection between the plates at about their end portions so as to permit uneven expansion of the plates with a minimum distortion of the door, two angle bars in spaced relation to the face of the oven and mounted rigidly at their upper ends on the oven at a distance above the doorway corresponding substantially to the vertical width of the door, and a roller journaled on a horizontal axis between said angle bars in position to apply pressure inwardly at about the upper edge of the inner plate of the door when the door is closed and to prevent outward movement of the door during an opening operation.

JOHN V. COOK.