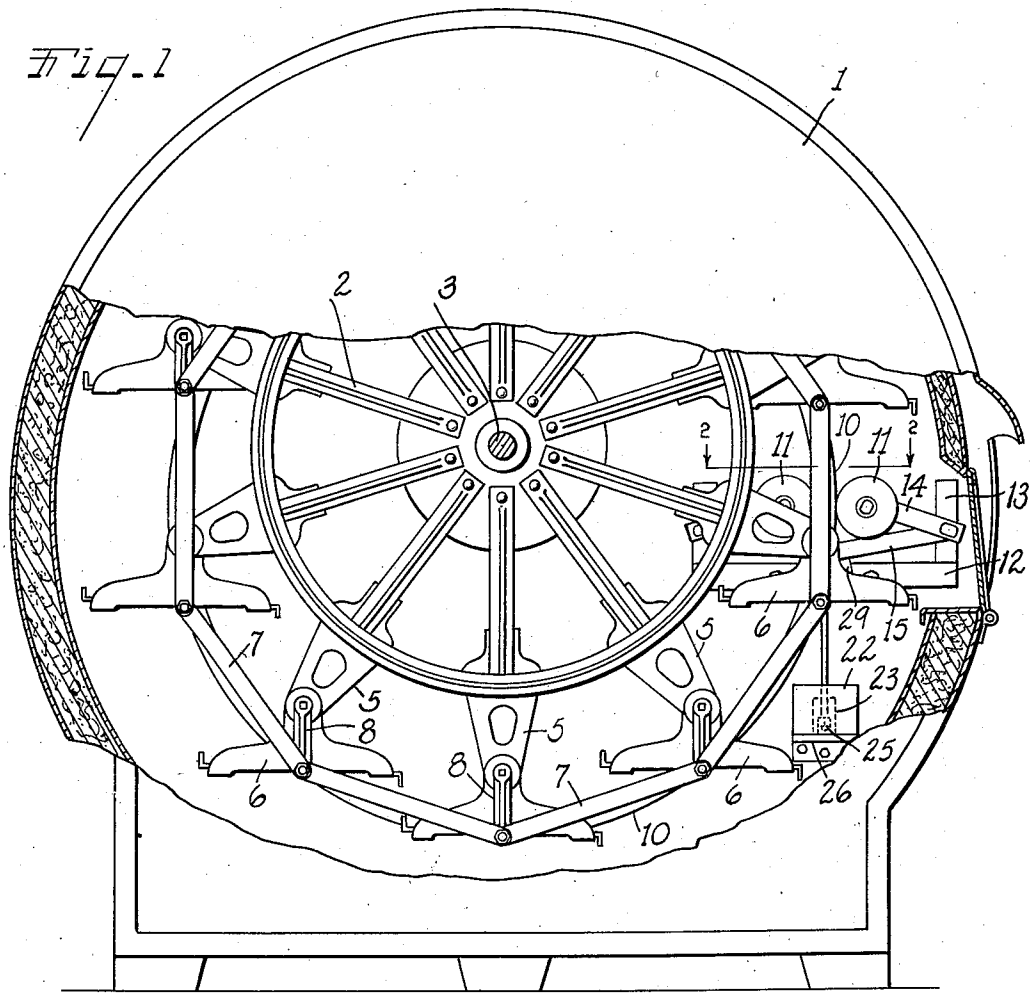
Nov. 28, 1939. L. E. GLEZEN 2,181,323

BAKER'S OVEN

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Fig. 1



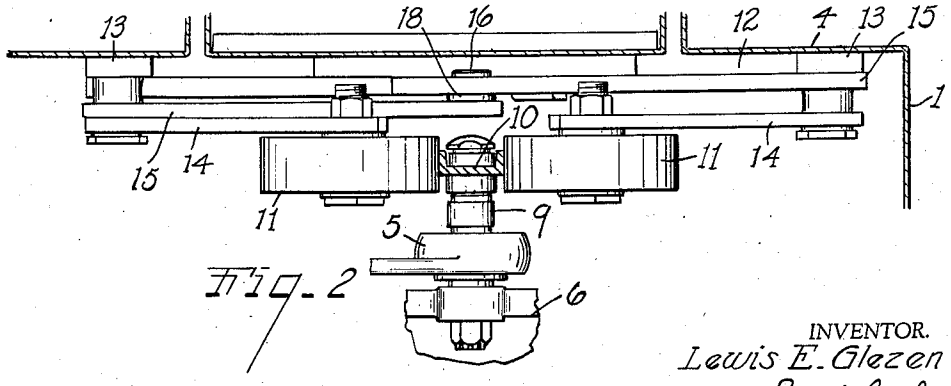


Fig. 2

INVENTOR.
Lewis E. Glezen
BY Earl & Chappell
ATTORNEYS

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BAKER'S OVEN

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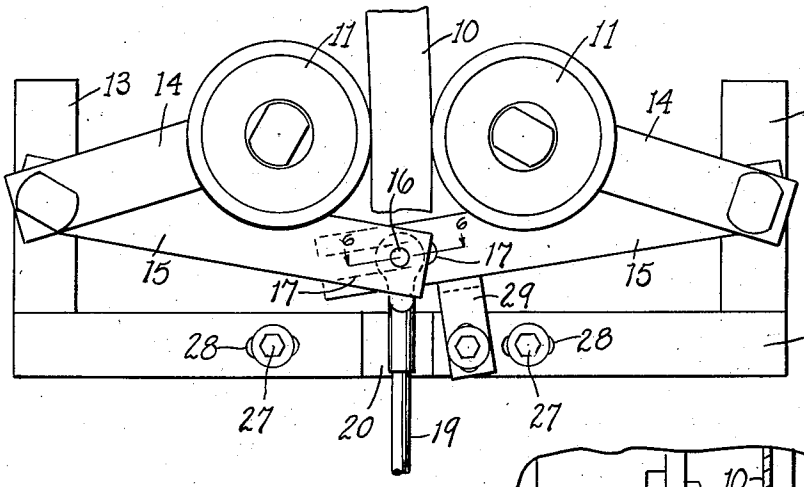


Fig. 3

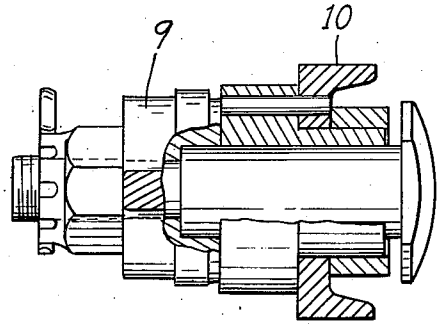


Fig. 5

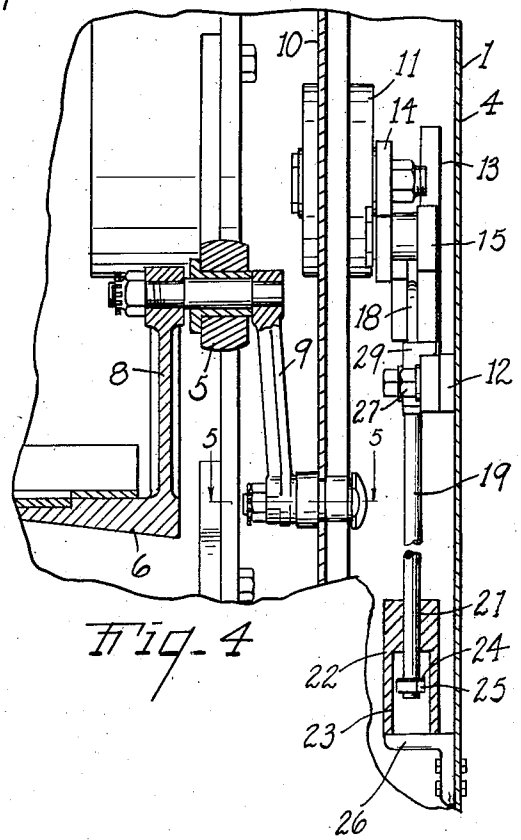


Fig. 4

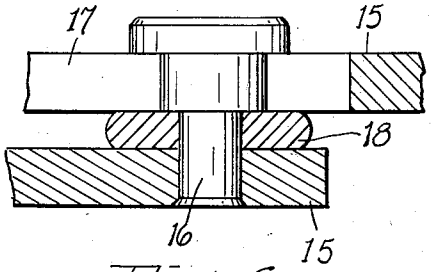


Fig. 6

INVENTOR.
Lewis E. Glezen
BY Earl O. Chappell
ATTORNEYS

Patented Nov. 28, 1939 2,181,323

UNITED STATES PATENT OFFICE

2,181,323

BAKER'S OVEN

Lewis E. Glezen, Albion, Mich., assignor to Union Steel Products Company, Albion, Mich.

Application September 19, 1938, Serial No. 230,573

10 Claims. (Cl. 107—59)

This invention relates to improvements in bakers' ovens.

The main objects of my invention are:

First, to provide a baker's oven of the continuous rotary type having improved means for guiding or counterbalancing the shelves thereof during their orbital movement to eliminate the possibility of chattering or breakage.

Second, to provide an oven of the type described having counterbalanced guide means for controlling the rotation thereof, which is of simple and improved construction.

Third, to provide an oven of the rotary type having a plurality of shelves mounted for orbital travel and improved guiding and compensating means for assuring that the orbit of travel will remain substantially unchanged.

Further objects relating to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is an end view of a baker's oven partially broken away and in vertical section, illustrating the relation of my improved guide means to the oven elements.

Fig. 2 is an enlarged fragmentary view in section on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary side view illustrating the details of construction of the counterbalancing device of my invention and the operative relation thereof to a guide member carried by the oven shelves.

Fig. 4 is a fragmentary side view in vertical section further illustrating the relation of the parts of the control device to the oven structure.

Fig. 5 is an enlarged view partially broken away and in section along a line corresponding to line 5—5 of Fig. 4 to illustrate a detail of the assembly.

Fig. 6 is an enlarged fragmentary view in section on a line corresponding to line 6—6 of Fig. 3 further illustrating a detail of the counterbalance.

The present invention relates to bakers' ovens of the type illustrated in the application of Charles T. Hatch, Serial No. 105,663 filed October 15, 1936, which matured March 7, 1939, into Patent No. 2,149,439, wherein means are provided to the end that the orbital travel of a plurality of shelves on a rotary oven will remain substantially undisturbed during the orbital travel of the shelves. The aforesaid application discloses resilient counterbalancing means for this purpose.

The present invention resides in improvements of the device shown and claimed in the aforesaid Hatch application, the improvements consisting in the simplification in the counterbalancing mechanism and further in alterations to be described.

Referring to the drawings, the reference numeral 1 in general indicates a continuous rotary baker's oven including a rotary spider 2 mounted on a shaft 3 journaled in the end walls 4 of the oven in an appropriate manner. Spider 2 carries rigidly projecting radial arms 5 to the ends of which are pivoted the respective shelves 6. In order to prevent haphazard pivotal movement of the shelves on their supports, they are articulated by means of links 7 extending between and pivotally connected to the ends of a plurality of depending cranks 8 secured to the shelves 6 at the pivots thereof and adjacent one of the ends of the shelves. The shelves have further depending arms 9 similarly connected to the shelves 6 at the pivot points of the latter adjacent the other end of the oven, i. e., the far oven wall 4 in Fig. 1, and pivoted at their free ends to a continuous guide ring 10 of channel section. The foregoing structure is generally similar to that illustrated and described in the Hatch application referred to above.

For the purpose of resiliently engaging ring 10 during the rotation of spider 2 and thereby counterbalancing the same against movement out of its proper orbital path, I provide a pair of ring engaging rollers 11 which are resiliently thrust against the flanges of the ring from opposite sides.

In order to support the rollers 11 for resilient engagement with the ring, I provide a frame 12 which is bolted to one of the end walls 4 of the oven, in the embodiment illustrated the far wall in Fig. 1. The frame is spaced inwardly from the wall and has a pair of vertical portions 13 to each of which is pivoted an arm 14 rotatably carrying on its outer end a roller 11. Likewise, a lever 15 is rigidly connected to each of the arms 14 for pivotal movement therewith as a unit, thus constituting a medially pivoted bell crank. These levers 15 extend into intersecting relation as illustrated in Fig. 3 and are connected at the point of intersection by means of a pin 16 carried by one of the levers and extending into an open slot 17 in the end of the other. Pin 16 passes through an eye 18 in a vertical weight rod 19 disposed between the levers, so that downward force exerted on rod 19 tends to move levers

15, arms 14, and rollers 11 in opposite angular direction, thus urging the rollers against the opposite sides of ring 10. The frame 12 has a bottom opening 20 accommodating rod 19.

The free end of rod 19 extends through a vertical hole or bore 21 in a suitable weight 22. This weight is counterbored at 23 in alinement with bore 21 and the rod 19 carries a washer 24 and nut 25 disposed in counterbore 23 as illustrated in Fig. 4.

The weight 22 normally rests on a suitable ledge 26 bolted to the oven wall 4 so that none of the weight thereof is borne by rod 19. In other words, the rollers 11 are initially and normally urged against ring 10 mainly by their own weight and the weight of arms 14, 15. Should the ring 10 be displaced excessively to one side or another due to uneven loading of the shelves or for another reason, one of the rollers 11 will be correspondingly displaced angularly in opposition to the force of its own weight to elevate rod 19. Provision is made that the rod may travel, say, three-quarters of an inch upwardly before picking up the safety weight 22. The weight of the extra counter-balance or safety weight 22 is generally sufficient to resiliently resist further displacement of the ring. If desired, a suitable warning signal (not shown), such as a bell or light, may be actuated at any desired position of weight 22 to warn the operator.

Frame 12 is adjustably mounted on wall 4 by means of the frame securing bolts 27 extending through elongated openings 28 in the frame whereby the latter may be shifted to one side or another to regulate the action of rollers 11 on ring 10. A stop 29 adjustably bolted to the frame limits the swing of the rollers in the direction toward ring 10.

The above described resilient counterbalancing device is extremely simple in nature, but very effective. By the provision of a pair of opposed counterbalancing rollers 11 coacting with opposite sides of ring 10, the ring is efficiently counterbalanced in both directions of its movement with a minimum of duplication of parts. It is generally sufficient to employ but a single pair of counterbalancing rollers on a single ring at one end of the oven conveyor or spider; however, in large installations it may be necessary to duplicate the provisions at the opposite ends. Furthermore, the shelf articulating links 7 may be furnished at both ends of the oven, if desired.

The device guides the orbital travel of the shelves and, due to the resilient nature of its counterbalancing action, absolutely prevents binding such as is apt to result in chattering of the parts and breakage. Such chattering and breakage are very undesirable because the former is noisy and causes loaves to settle during baking. As for the latter, the expensive nature of ovens of the type under consideration makes it wise to employ every precaution to prolong the life thereof.

I have illustrated and described my improvements in an embodiment which is very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. In a baker's oven having a rotary spider carrying a plurality of pivoted shelves, means for linking the shelves for angular movement on their pivots as a unit, and means for guiding the shelves during the orbital travel thereof comprising a continuous annular guide ring, means for pivotally suspending the ring from the shelves, a pair of guide rollers disposed on one side of the oven to engage opposite faces of the ring, means for pivotally mounting said rollers on the oven and means for counterbalancing said rollers against the ring as a unit comprising a pair of bell cranks, each carrying one of the rollers on an arm thereof and pivoted on the oven, a depending rod connected to the other arms of the bell cranks and a weight adapted to be engaged and lifted by the rod in the event the ring is displaced excessively to thereupon displace one of said counterbalancing rollers more than a predetermined amount.

2. In a baker's oven having a rotary spider carrying a plurality of pivoted shelves, means for guiding the shelves during the orbital travel thereof comprising a continuous annular guide ring, means for pivotally suspending the ring from the shelves, a pair of guide rollers disposed on one side of the oven to engage opposite faces of the ring, means for pivotally mounting said rollers on the oven and means for counterbalancing said rollers against the ring as a unit comprising a pair of bell cranks, each carrying one of the rollers on an arm thereof and pivoted on the oven, a depending rod connected to the other arms of the bell cranks and a weight adapted to be engaged and lifted by the rod in the event the ring is displaced excessively to thereupon displace one of said counterbalancing rollers more than a predetermined amount.

3. In a baker's oven having a rotary spider carrying a plurality of pivoted shelves, means for linking the shelves for angular movement on their pivots as a unit, and means for guiding the shelves during the orbital travel thereof comprising a continuous annular guide ring, means for pivotally suspending the ring from the shelves, a pair of guide rollers disposed on one side of the oven to engage opposite faces of the ring, means for pivotally mounting said rollers, and means for resiliently urging said rollers toward one another and against the ring in the event the ring is displaced excessively and thereby displaces one of said counterbalancing rollers more than a predetermined amount.

4. In a baker's oven having a rotary spider and a plurality of shelves pivoted thereto and carried thereby in an orbital path relative to the axis of rotation of the spider, means for guiding the shelves during the orbital travel thereof comprising a continuous annular guide ring, arms on the shelves, means for pivotally suspending the ring from the arms, a pair of guide rollers disposed on one side of the oven to engage opposite faces of the ring, means for pivotally mounting said rollers on the oven, and means for resiliently urging said rollers toward one another and against the ring in the event the ring is displaced excessively and thereby displaces one of said counterbalancing rollers more than a predetermined amount.

5. A baker's oven including a plurality of shelves, means pivoted to the shelves and transporting the same orbitally, guide means for the shelves to control the orbital movement thereof including a continuous annular ring, means connecting the ring to the shelves for pivotal movement relative to the shelves, a pair of counterbalancing rollers supported at one side of the

oven and engaging opposite arcuate faces of the ring, and means for resiliently urging said rollers against said faces to normally maintain the ring in its proper orbit, said last named means comprising a weight and connections between said weight and rollers whereby to elevate the weight in response to predetermined displacement of either of the rollers.

6. A baker's oven including a plurality of shelves, means for transporting the shelves orbitally, guide means therefor including a continuous annular ring, means for pivotally connecting the ring to the shelves, a pair of elements supported at one side of the oven and engaging opposite arcuate faces of the ring, and means for resiliently urging said elements against said respective faces to normally maintain the ring in its proper orbit, said last named means comprising a weight and elements whereby to elevate the weight in response to a predetermined displacement of either of the elements.

7. A baker's oven including a plurality of shelves, means pivotally connected to the shelves for transporting the same orbitally, guide means therefor including a continuous annular ring, means for pivotally connecting the ring to the shelves, a pair of elements mounted at one side of the oven and engaging opposite arcuate faces of the ring, and means for resiliently urging said elements against said respective faces to normally maintain the ring in its proper orbit.

8. A baker's oven comprising a plurality of shelves, means to which the shelves are pivotally connected for transporting the shelves orbitally, means for preventing excessive displacement of the shelves during the orbital travel thereof comprising a ring pivotally mounted to the shelves and a pair of guide elements carried by the oven and engaging respectively the inner and outer arcuate faces of the ring, and means for resiliently urging said elements as a unit in opposite directions against said faces when the displacement of the ring is excessive to thereby resist further displacement thereof comprising a weight and means connected to said elements and adapted to engage the weight when the displacement of the ring is excessive, there being provision for permitting a limited movement of said last named means and said elements prior to engagement of the last named means with the weight.

9. A baker's oven comprising a plurality of shelves, means to which the shelves are pivotally connected for transporting the shelves orbitally, means for preventing excessive displacement of the shelves during the orbital travel thereof comprising a ring pivotally mounted to the shelves and a pair of guide elements carried by the oven and engaging respectively the inner and outer arcuate faces of the ring, and means for resiliently urging said elements against said faces when the displacement of the rings is excessive to thereby resist further displacement thereof compriisng means connected to said elements adapted to subject the same to a resilient force resisting displacement thereof by the ring, there being provision on said last named means for permitting a predetermined displacement of the elements prior to subjecting the same to said force.

10. A baker's oven comprising a plurality of shelves, means for transporting the shelves orbitally, means for preventing excessive displacement of the shelves, comprising a ring pivotally mounted to the shelves, and guide elements carried by the oven and engaging respectively the inner and outer arcuate faces of the ring, and means for resiliently urging said elements against said faces upon predetermined displacement of the ring.

LEWIS E. GLEZEN.