W. F. PETERSEN.

FEEDING MECHANISM FOR BAKERS' OVENS.

APPLICATION FILED AUG. 28, 1912.

1,095,669.

Patented May 5, 1914.

4 SHEETS—SHEET 1.

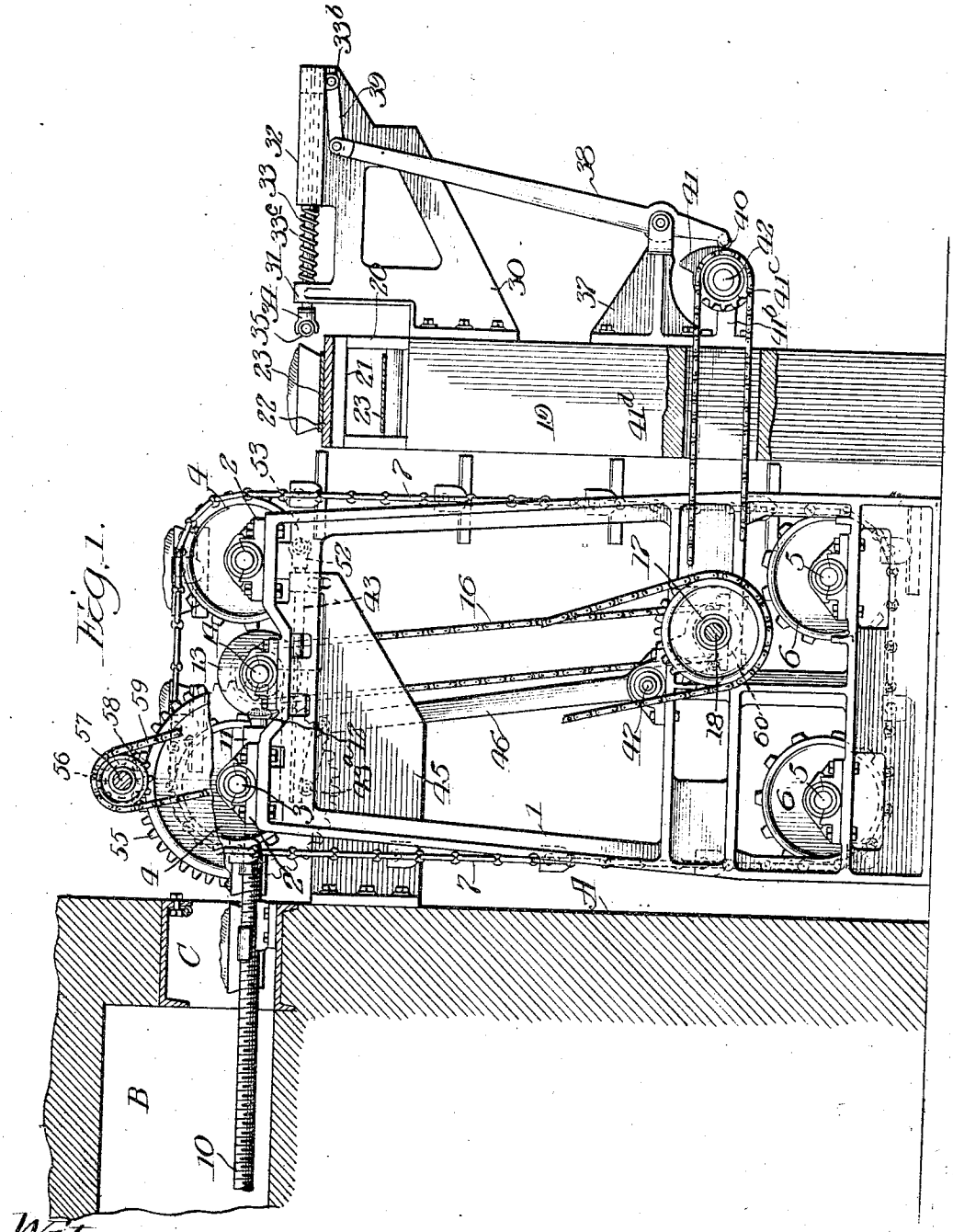


Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 4.

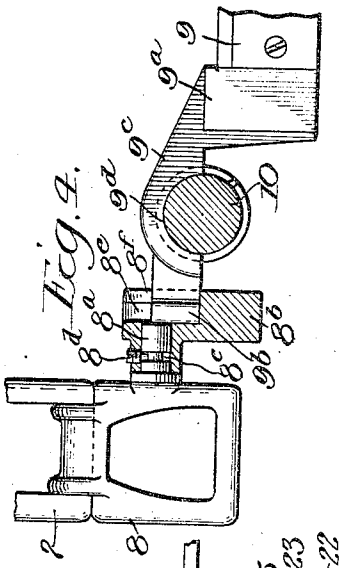


Fig. 5.

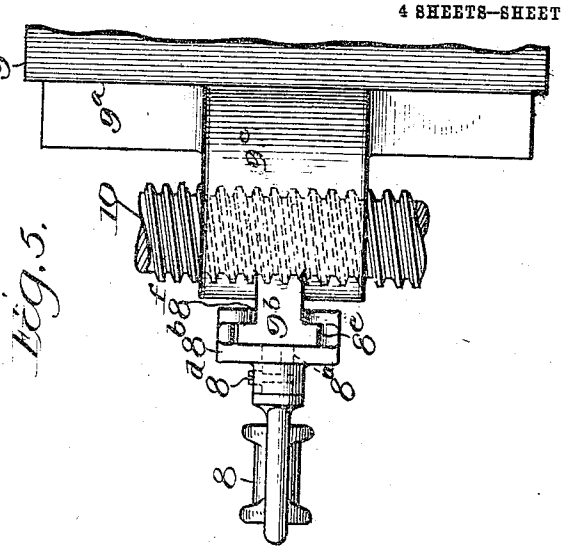
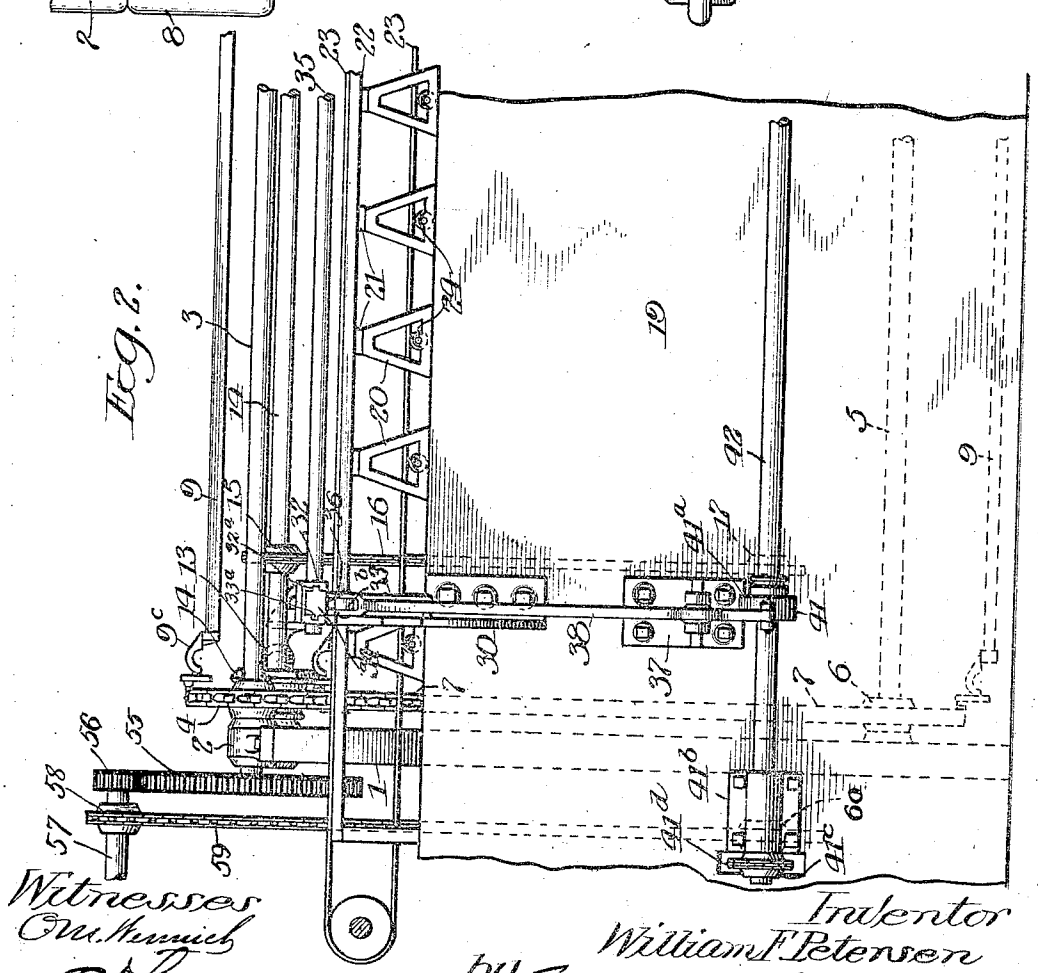


Fig. 2.



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4 SHEETS—SHEET 3.

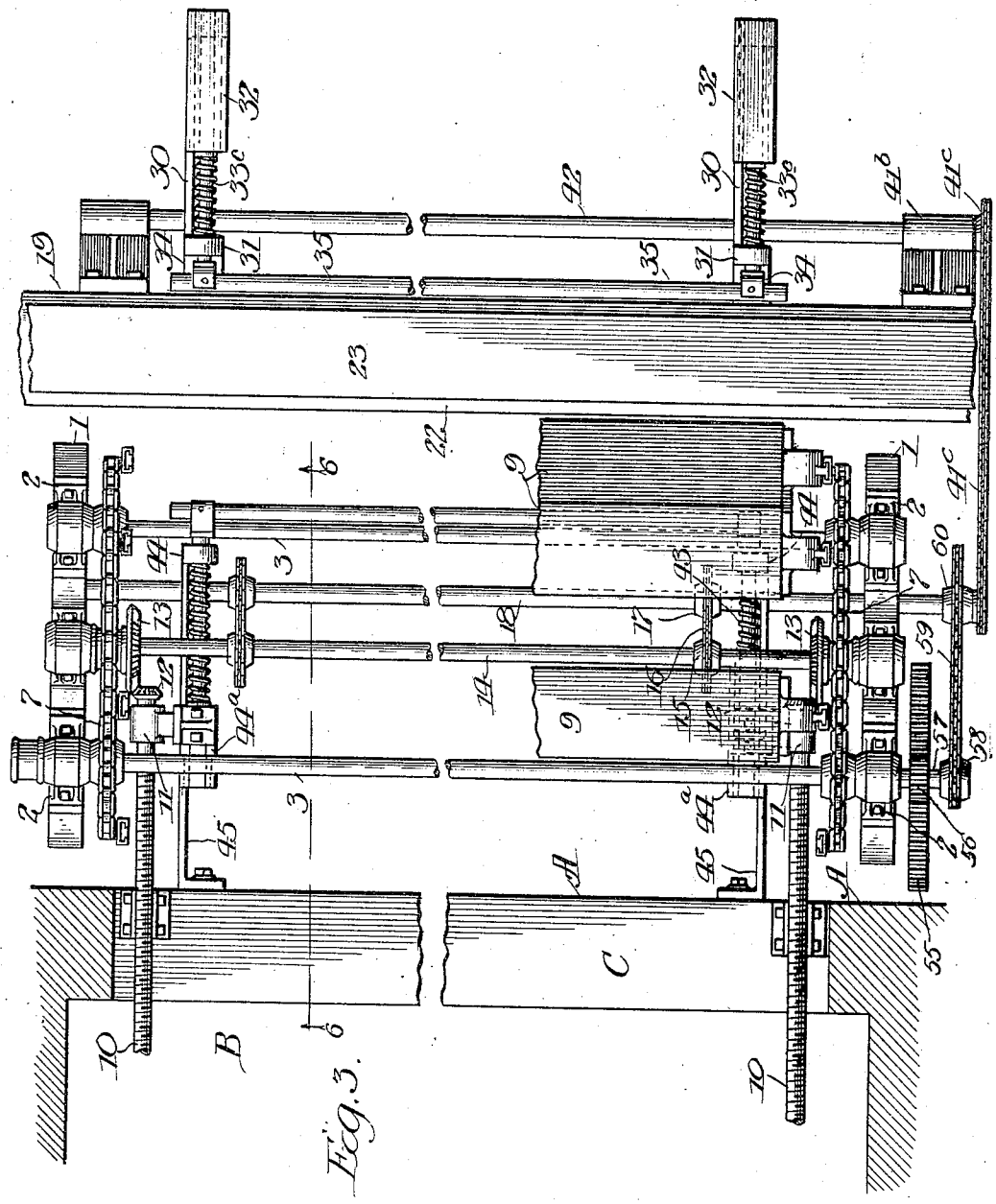


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 7.

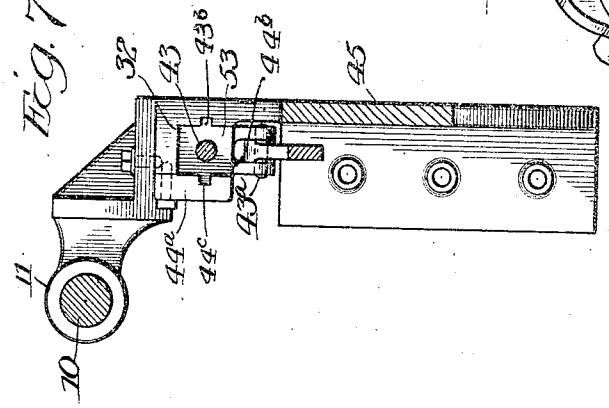



Fig. 8.

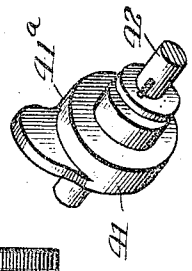
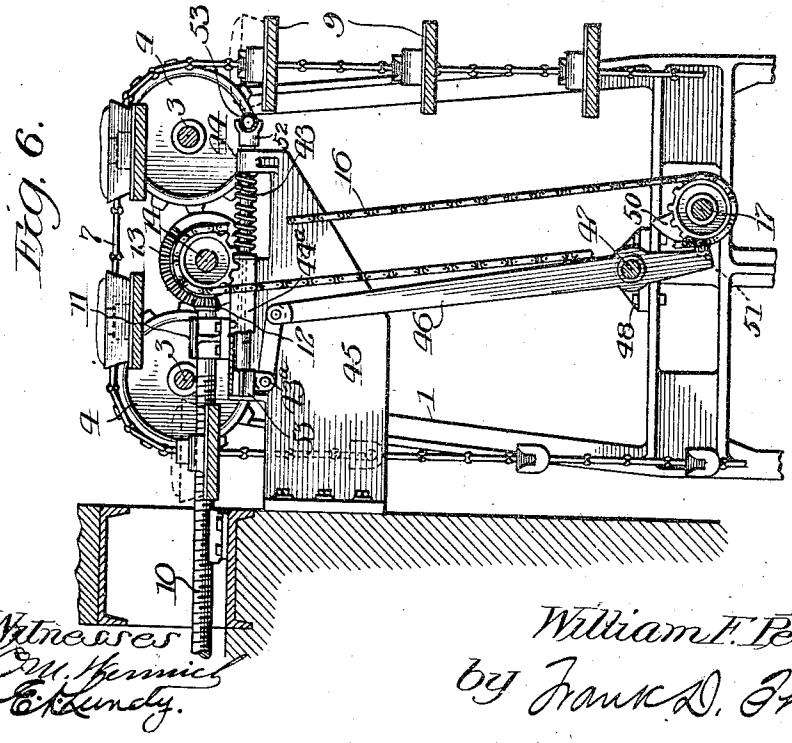



Fig. 6.




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# UNITED STATES PATENT OFFICE.

WILLIAM F. PETERSEN, OF CHICAGO, ILLINOIS.

## FEEDING MECHANISM FOR BAKERS' OVENS.

1,095,669. Specification of Letters Patent. Patented May 5, 1914.

Application filed August 28, 1912. Serial No. 717,495.

*To all whom it may concern:*

Be it known that I, WILLIAM F. PETERSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Feeding Mechanism for Bakers' Ovens, of which the following is a full, clear, and exact description.

My invention relates to bakers' ovens and particularly to the type known as the "wide-mouth" oven wherein the feed door to the baking-chamber extends entirely across the front of said chamber as disclosed in Letters Patent of the United States No. 975,889, granted to me November 15th, 1910, for improvements in "bakers' ovens."

Broadly stated, the object of my invention is to provide a baker's oven with automatic means for feeding the dough into the baking-chamber in an expeditious manner, and the particular objects of said invention are to arrange this mechanism in a compact manner, with as few complicated parts as possible and to construct the same so that it can be readily and economically applied to various ovens now in use without special machinery.

A further object is to construct this feeding mechanism in such manner that the operation of the same may readily be reversed in order to remove the loaves of baked bread from the oven without the necessity of employing additional mechanical elements,—in other words, the feeding of the oven and the discharge of the baked products will be performed by the same mechanism.

These and other objects I accomplish by the means and in the manner hereinafter fully described and as more particularly pointed out in the claims, reference being had to the accompanying drawings, forming a part hereof, in which,

Figure 1 is a vertical side elevation of the front portion of an oven showing my feeding mechanism applied thereto, Fig. 2 is a vertical front elevation thereof showing only the left-hand portion of the mechanism, that on the opposite end being a substantial duplicate. Fig. 3 is a top plan view of my invention showing the oven in horizontal section through the baking-chamber. Fig. 4 is a transverse section of the feed worm showing the shelf in engagement therewith and illustrating the details of construction of the link-belt and means carried thereby for removably supporting the shelf. Fig. 5 is a top plan view of the parts shown in Fig. 4. Fig. 6 is a vertical fragmentary section of the upper portion of the mechanism taken on line 6—6, Fig. 3. Fig. 7 is an enlarged detail view of one of the discharging plungers and its bearing. Fig. 8 is a perspective view of one of the actuating cams.

Referring to the drawings, A represents the front wall of a baker's oven, B the baking-chamber thereof, and C the door opening through which access and light is had to said baking-chamber. For the purpose of convenience, I have shown and described my invention applied to a "wide-mouth" oven wherein the door C extends across the entire width of the front of the baking-chamber B, thus affording access and light to the entire chamber and permitting the peeling to be performed straight in and out parallel to the side-walls of the baking-chamber. It will be understood, of course, that my invention is applicable to ovens of any other well-known types without altering the mechanism herein shown and described and without departing from the spirit of my invention as set forth in the claims.

Mounted in front of the oven door, and preferably beyond the vertical planes of the ends of said door are two correspondingly shaped vertical standards or side-frames 1, 1, that support the bearings of the various shafts and other elements used in connection with my invention. These side-frames are substantially rectangular in shape and have a portion of their upper edges depressed so as to form slightly elevated plateaux at each end of said top edge on which suitable bearing blocks 2, 2, are secured for the horizontally disposed parallel shafts 3, 3. These shafts extend through their bearings and have suitable sprocket-wheels 4, 4, secured to their extended ends.

Mounted in suitable bearings in the lower portion of frames 1, 1, and preferably with their axes in planes parallel to the axes of the upper shafts, are two horizontally disposed shafts 5, 5, that extend beyond their bearings and have sprocket-wheels 6, 6, secured to their outer extended ends. The sprockets on each side of the frames are con-

nected by suitable link-belts 7, 7, so that they are all driven in unison. The details of these link-belts are shown in Fig. 4 and 5 of the drawings, and preferably comprise a plurality of links which are connected at equal distances apart by specially constructed links 8 which latter have lateral studs $8^a$ projecting from one side edge. These studs enter a hollow boss projecting laterally from the upper portion of a rectangular shaped metallic hanger $8^b$. In order to retain the hanger $8^b$ in position on the stud a slot or groove $8^c$ is cut in the outer surface of said stud and a screw $8^d$ having a reduced lower end is tapped into the boss of the hanger until the reduced portion of the screw enters said groove or slot $8^c$. The hanger is, preferably, provided with a vertically disposed slot $8^e$ that extends from the upper edge thereof to a point about the center of length of said hanger and is provided with a restricted opening $8^f$ in its surface opposite its pivotal boss for the reception of a headed stud $9^b$ projecting laterally and horizontally from the outer end of a bracket $9^a$ to the end of a shelf 9. These shelves 9 are removably mounted on the link-belt and are approximately the same length as the oven door so that the pans of dough may be fed to and discharge from the baking-chamber. Said shelves comprise an elongated rectangular plate and have brackets $9^a$ secured to each end that are provided with an outwardly projecting lug or boss $9^c$ having a segmental shaped undercut threaded recess $9^d$ formed in their under surfaces and beyond this boss $9^c$ the stud $9^b$, (above described) extends. These shelves are adapted to receive the unbaked dough in pans from a suitable traveling apron, as will hereinafter be fully described, and then convey said material to the mouth of the oven where the shelves are automatically removed from the link-belt by having their threaded recesses $9^d$ engage with worm-shafts 10, extending from the rear wall of the baking-chamber into and through the oven to suitable bearings 11, in the top of the side-frames 1.

There are, preferably, two worm-shafts 10, one adjacent each side or end wall of the baking-chamber and their outer ends extend beyond their bearings and have suitable miter or beveled pinions 12, secured thereto. Pinions 12 are driven by larger beveled gears 13, on the ends of a horizontally disposed shaft 14 journaled on top of the side-frames, which shaft derives motion through the medium of a sprocket 15 on the outer end thereof, and a chain 16 that connects with a suitable sprocket 17 on a horizontally disposed drive-shaft 18 journaled in the lower portion of the side-frames. In order to time the feed of these worms 10 so that the shelves may be placed thereon in successive order and in close proximity to each other, the beveled gears 13 are mutilated (as shown in Fig. 3) so that their teeth will engage the pinions 12 a portion of a revolution and then be disengaged. This gives the worm shafts an intermittent rotary movement that is sufficient to move the shelves thereon just far enough away from the link-belts to escape the next shelf being carried toward the worms by said link-belts.

In front of the side-frames and preferably extending across the entire width of the oven, I build a solid wall 19 of masonry or the like, the top of which terminates below the horizontal plane of the bottom of the oven door. In bakeries where a battery of a number of ovens are employed side by side this wall, preferably, extends in front of the entire length of the ovens and has dividing walls or partitions that separate the mechanism one from another. However, where only one oven or baking-chamber is employed this wall is built continuous, out from each end of the oven wall and along the front of the same. This wall forms a compartment that retains an amount of heat sufficient to warm the shelves and prevent the chilling of the dough as it is fed to the oven. At suitable points along the top of wall 19 are mounted several vertically disposed metallic standards 20 and the opposite disposed standards are connected by cross-pieces 21, forming a support for a floor or planking 22 extending the entire length of the top of said wall. The traveling on this planking is a canvas-belt conveyer or apron 23 that moves longitudinally thereon to one end where it passes down on the end of the planking and under the same where its return movement is guided by a plurality of rollers 24 having their ends journaled in bearings in the standards 20.

The conveyer is driven by suitable belts and gears from the main drive-shaft of the mechanism or direct from the line shaft (not shown). Suitable brackets 30 are bolted or otherwise secured to the front wall 19 adjacent each end thereof and are each provided in their upper horizontal surfaces with bearings 31 and 32 for a suitable horizontally disposed plunger 33. Bearings 32 are preferably substantially rectangular shaped in cross-section and have their vertical walls provided with longitudinally disposed alining grooves $32^a$, and having longitudinally disposed slots 36 in their under surfaces. The portion of plunger 33 operating in these bearings 32 is also rectangular and have tenons or ribs $33^a$ that slide in grooves $32^a$ while their opposite ends are provided with heads $34^a$ in which a transversely disposed horizontal shifting bar 35 that connects the same is mounted. Another smaller bracket 37 is bolted to the wall 19 just below and in vertical alinement with

each of the before-mentioned brackets and said smaller brackets have pivotal bearings in their outer ends for elongated reciprocable levers 38 fulcrumed adjacent their lower ends that have their upper ends connected by links 39 to the lugs 33[b] depending from their respective plungers through slots 36. The ends of the levers below their fulcrums are, preferably, bent laterally and bifurcated to journal anti-friction rollers 40. Levers 38 are actuated by cams 41 slidably mounted on but rotatable with a horizontally disposed shaft 42 and said cams each have a lateral shoulder 41[a] that is concentric to all points with the axis of rotation of the cam. Cams 41 are feathered on shaft 42 having bearings 41[b] secured to the wall 19, and said shaft is driven by a sprocket 41[c] connected by a chain 41[d] to a suitable source of driving power or directly to a shaft carrying a corresponding cam mounted in the side-frames as will hereinafter be fully described. When the cams are rotated and the rollers 40 are engaged thereby they will actuate and move the upper ends of the levers 38 toward the oven and move the plungers in the same direction causing the transverse shifting bar 35 to engage and shove the pans of dough off the conveyer apron onto one of the shelves 9. Suitable expansion coiled springs 33[c] are provided that surround said plunger 33 as shown, one end of which springs engage bearings 31 and the opposite ends press against the shoulders formed by meeting points between the plungers and their squared ends. These springs return said plungers to their normal positions after each reciprocation thereof.

The shelves, as fast as they are loaded are moved by the link-belts upwardly a short distance, then horizontally to a point over the worm shafts, where they are then lowered vertically until the threaded recesses at the ends of said shelves seat on said shafts and convey said shelves into the oven. After the oven has been fully "peeled" or charged, the feeding mechanism is stopped although the conveyer apron may be allowed to operate to carry the loaded pans to the next oven door in the event of the feeding mechanism being employed in connection with more than one oven as in a large baking establishment. As soon as the baking process has been completed the driving mechanism is reversed in any suitable manner and the cams 41 shifted longitudinally on their shaft so that the concentric portion only will be engaged by the end of levers 38. At the same time suitable discharge plungers 43 are thrown into operation. These latter plungers correspond in construction and operation to plungers 33 and are mounted in bearings 44 and 44[a] on the upper edge of brackets 45 bolted, preferably, to the front wall of the oven slightly below the horizontal plane of the sill of the door. Bearings 44[a] have slots 44[b] cut in their under surfaces through which the lateral lugs 43[a] pass from the under side of plungers 43. The interior side walls of these bearings are, preferably, provided with aprons 44[c] in which tenons 43[b] of the plungers slide the same as the bearings and plungers before described. The actuating levers 46 are fulcrumed near their lower ends on a horizontal shaft 47 journaled in bearings 48 on the webs of the side-frames. Slightly below the pivotal shaft 47 a horizontal shaft 17, before mentioned, is journaled in the side-frames and has cams 50 feathered on each of its ends so that they rotate with said shaft but have a longitudinal movement independent thereof. Said cams each have a concentric shoulder similar to those on the cams 41, above described, so that when they are shifted on their shaft the rollers 51 on the lower ends of levers 46 will not be actuated and their respective plungers will remain stationary. The ends of the plungers 43 have bifurcated heads 52 in which a transverse shifting bar 53 is secured. When it is desired to discharge the oven of the baked bread the levers 46 are actuated by their respective cams and the link-belt and worms being reversed, the shelves containing the baked bread will be moved through the oven where said shelves will be picked up by the link-belt and conveyed to a point opposite the conveyer apron at which time plungers 33, being stationary, plungers 43 will operate and shove the pans off the shelf onto said conveyer apron where they travel to a point to be removed by hand.

One of the sprocket shafts 3 is preferably extended beyond its bearing at one end where it has a large gear 55 secured to its extended end, which gear is driven by a pinion 56 fast on a line or drive-shaft 57. This comprises the main driving means for the devices, and in order to drive the cam-shafts a sprocket 58 is mounted on the drive shaft and is connected by a chain 59 to a sprocket 60 on the extended end of cam-shaft 18, which latter in turn drives cam-shaft 42 by chain 41[c] and also the beveled gear shaft 14 by a chain 16.

I have neither shown nor described any particular reversing mechanism for it is quite obvious that any well-known and convenient type that is adapted for use in this connection may be employed as desired. Neither have I illustrated nor described the shifting mechanism for the cams that actuate the plunger levers, for these too may be of any convenient type.

What I claim as new is:—

1. The combination in a baker's oven, of reversible chains, removable shelves suspended thereon reversible worms for removing said shelves from said chains and

moving them into and out of said oven, and returning the same to said chains and means for removing the load from said shelves after the latter have been received by said chains.

2. The combination in a baker's oven, of reversible chains, removable shelves suspended thereon, reversible intermittently movable worms for removing said shelves from said chains and moving them into and out of said oven, and returning the same to said chains and means for removing the load from said shelves after the latter have been received by said chains.

3. The combination with a baker's oven having an opening therein and conveying devices extending through said opening into said oven, of an endless apron upon which the load is moved laterally, endless chains that move vertically past said apron, shelves removably mounted upon and carried by said chains, means for pushing the load from said apron to and upon said shelves, and brackets secured to the ends of said shelves that engage the devices extending into the oven whereby said shelves are bodily carried into and out of said oven.

4. The combination with a baker's oven having a single opening and conveying devices extending through said opening into said oven, a transversely movable endless apron, endless chains movable vertically in front of said apron, shelves for carrying the load adapted to be moved into and out of said oven on said devices, means carried by said chains for removing said shelves from said devices and carrying the latter to and in front of said apron, and mechanism for pushing the load from said shelves onto said apron.

5. The combination with a baker's oven, of a plurality of shelves, a link-belt conveyer adapted to feed said shelves to the door of said oven, separate devices that receive said shelves bodily from said conveyer and move them into the oven and then discharge said shelves from the oven to said link-belt conveyer, and a traveling apron upon which said shelves are loaded before transit in the oven, and upon which said load is emptied after transit.

6. The combination with a baker's oven and reversible conveying devices extending through the door of the same, of a transversely movable endless apron, reversible endless chains movable vertically in front of said apron, shelves for carrying the load adapted to be moved into and out of the oven, means carried by said chains for moving said shelves from said devices to said apron when said devices are moving in one direction and vice versa when said devices are reversed, mechanism for pushing the load from said apron onto said shelves, and separate mechanism for pushing the load from said shelves onto said apron, one of said mechanisms adapted to operate when the other is stationary.

7. The combination with a baker's oven and reversible conveying devices extending through the door of the same, of a transversely movable endless apron, reversible endless chains movable vertically in front of said apron, shelves for carrying the load adapted to be moved into and out of the oven, means carried by said chains for moving said shelves from said devices to said apron when said devices are moving in one direction and vice versa when said devices are reversed, mechanism for pushing the load from said apron onto said shelves, and separate mechanism alining with said first-mentioned mechanism for pushing the load from said shelves onto said apron, one of said mechanisms adapted to operate when the other is stationary.

8. The combination with a baker's oven, of a transversely movable apron, a series of vertically movable shelves that pass in front of said apron in one direction to receive the load and the opposite direction to discharge the load, means for pushing the load from said apron to said shelves, when the latter are moving in one direction and means for pushing the load off said shelves onto said apron when said shelves are moving in the opposite direction.

9. The combination with a baker's oven, of a transversely movable apron, a series of vertically movable shelves that are capable of movement in both directions past said apron, means for pushing the load from said apron to said shelves, means for pushing the load off said shelves onto said apron, said shelves movable respectively in one direction when the first-mentioned means are in operation and in the opposite direction when the last-mentioned means are in operation and devices adapted to receive said shelves and bodily convey the same into and out of the oven.

10. The combination with a baker's oven and reversible worms extending into the same, of a transversely movable endless apron, reversible chains movable vertically in front of said apron, shelves for carrying the load from said apron to said worms and back to said apron, means for pushing the load from said apron to said shelves, and separate means for pushing the load off said shelves onto said apron, one of said means adapted to operate when the other is stationary.

11. The combination with a baker's oven having a single opening reversible, intermittently rotatable worms extending into said oven, of a transversely movable endless apron, reversible chains movable vertically in front of said apron, shelves for carrying the load from said apron to said worms

and back to said apron, a plunger for pushing the load from said apron to said shelves, and a separate plunger in horizontal alinement with said first-mentioned plunger for pushing the load off said shelves onto said apron, one of said plungers adapted to operate when the other plunger is stationary.

In witness whereof I have hereunto set my hand this 29th day of July, 1912.

WILLIAM F. PETERSEN.

Witnesses:
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