July 22, 1924. 1,502,019

C. J. CLEAR ET AL

EXHAUST BOX

Filed Sept. 21, 1922 5 Sheets-Sheet 1

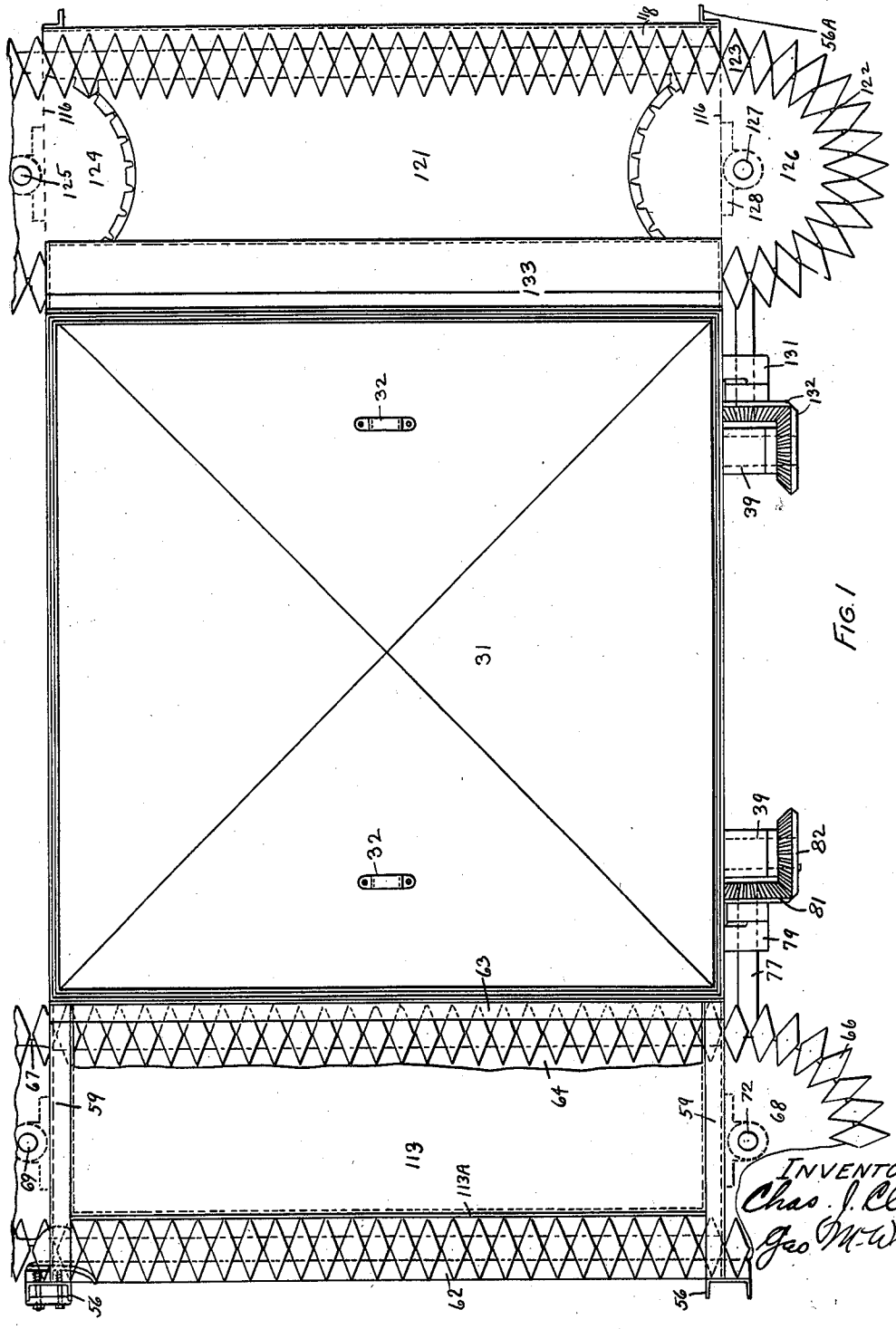


FIG. 1

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EXHAUST BOX

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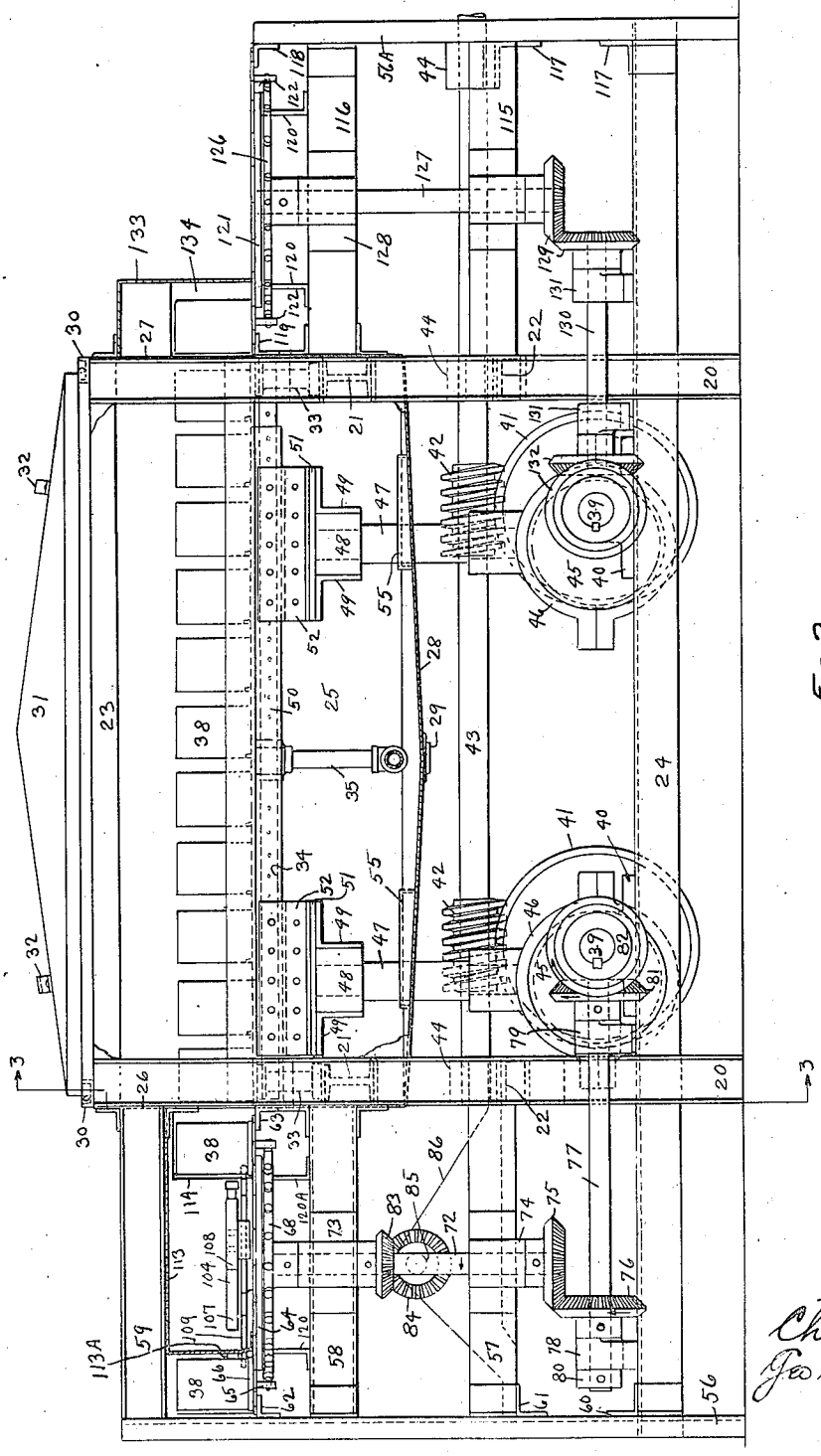


FIG. 2.

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EXHAUST BOX

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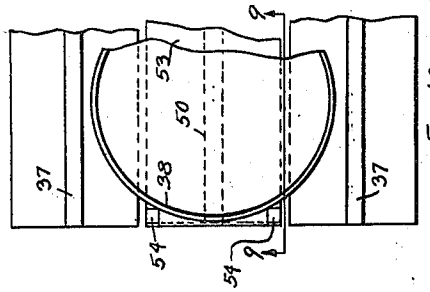


FIG. 10

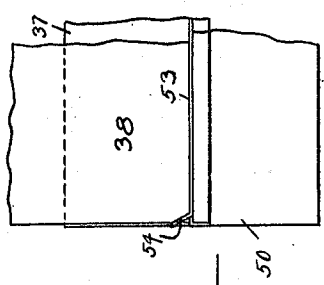


FIG. 9

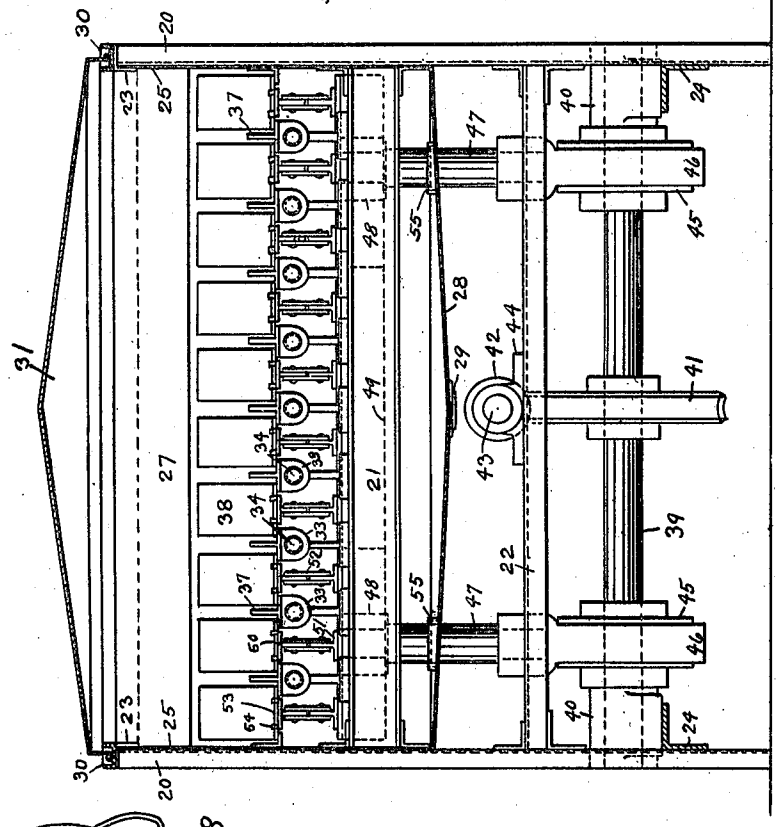


FIG. 3

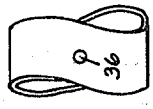


FIG. 8

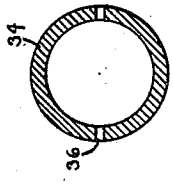


FIG. 7

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EXHAUST BOX

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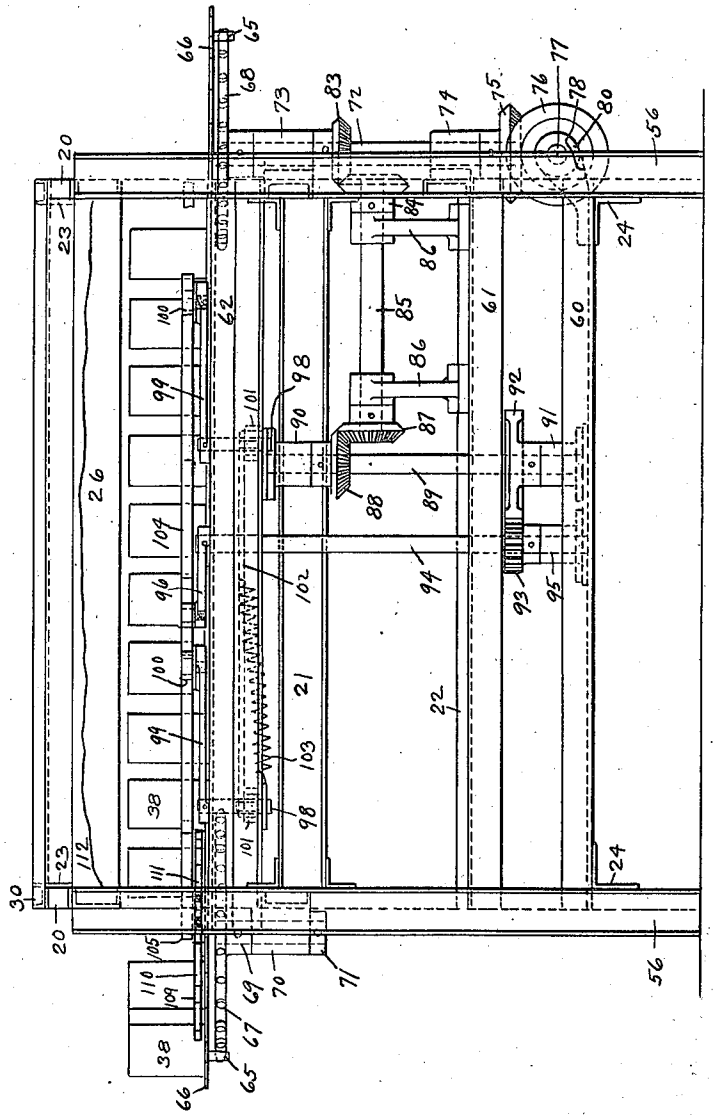


FIG. 4

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EXHAUST BOX

Filed Sept. 21, 1922 5 Sheets-Sheet 5

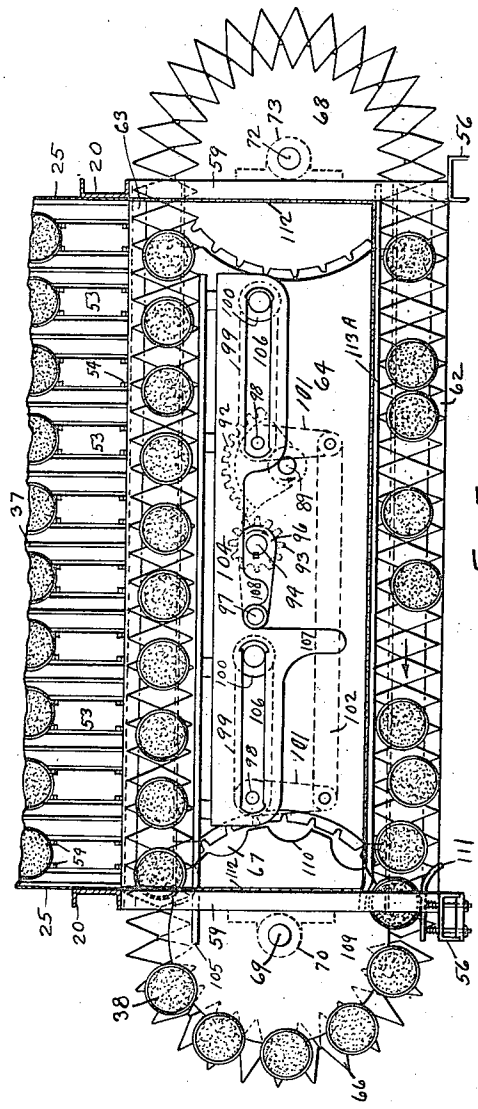


FIG. 5

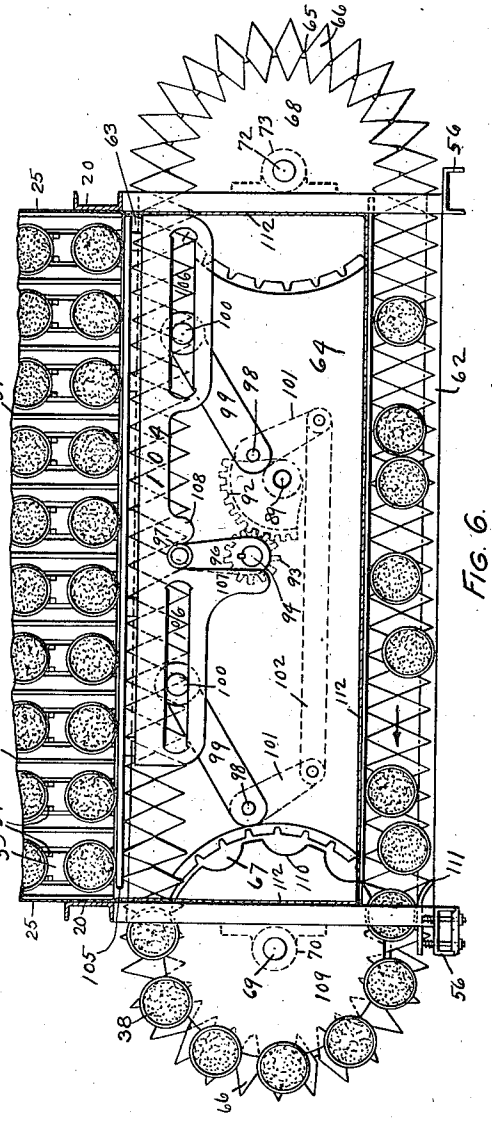


FIG. 6.

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Patented July 22, 1924. 1,502,019

UNITED STATES PATENT OFFICE.

CHARLES J. CLEAR AND GEORGE M. WEBBER, OF PORTLAND, OREGON.

EXHAUST BOX.

Application filed September 21, 1922. Serial No. 589,709.

To all whom it may concern:

Be it hereby known that we, CHARLES J. CLEAR and GEORGE M. WEBBER, citizens of the United States, and residents of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Exhaust Box, of which the following is a specification.

This invention relates more particularly to fruit canning machinery.

The object of our invention is to provide an exceedingly simple and efficient means for exhausting air from fruit, etc., in cans preparatory to sealing.

A further object is to so construct same that the working parts are not exposed to the action of steam and that all of the parts which require attention are easily accessible.

A still further object is to enable the operator to place the filled cans on a conveyor without any particular regard to their position or spacing without any danger of crushing a can or spilling the contents.

Still another object is to so arrange the heating pipes that quick heating may be secured and an even temperature be maintained throughout the entire box and that any adhering particles will be blown from the can-supporting carriers within the box and carried off in the waste.

We accomplish these results in the manner set forth in the following specification and illustrated in the accompanying drawings, in which:

Figure 1 is a plan of our device with a portion of the hood over the receiving section cut away and showing one section of the exhaust box. Figure 2 is a side elevation of same with the exhaust box and hoods over receiving and discharging ends broken away in section. Figure 3 is a section along the line 3—3 in Fig. 2. Figure 4 is a front elevation with the links of the conveyor chain removed. Figure 5 is a plan of the feeding portion of our device showing same ready to push a row of cans into the exhaust chamber. Figure 6 is a view similar to Fig. 5 but showing the row of cans in the exhaust chamber and the feeding device preparing to return for another row of cans. Figure 7 is a section through a heating pipe of which Figure 8 is a side elevation. Figure 9 is an enlarged view of the can removing lugs. Figure 10 is a plan of Fig. 9.

Similar numbers of reference refer to the same or similar parts throughout the several views.

Referring in detail to the drawings, it will be seen that the machinery may be divided into three sections, a receiving or feeding section, an exhausting section, of which only one unit is shown, and a discharge section by way of which the cans are taken from the exhaust box.

The exhaust box itself consists of four upright posts 20 joined by the transverse ties 21 and 22 and the longitudinal ties 23 and 24. A sheet metal box is placed between the posts 20 and its sides 25 to extend to the top of said posts between the posts and the ties 23. The front and rear walls 26 and 27 are on the outside of the posts 20 and are provided with inlet and exit openings for the cans. The bottom 28 of the exhaust box slopes toward the center, where is located a drain 29 which may be connected with a waste pipe in the most convenient manner. A channel iron 30 is secured over the upper edge of the walls 25, 26 and 27 and is preferably filled with water for the purpose of forming a seal with the cover 31 which rests in the channel 30 and is provided with the handles 32.

Secured upon the ties 21 are the standards 33 through which are passed the steam pipes 34 which are fed from the supply pipe 35. The pipes 34 are provided with the lateral openings 36 through which the steam escapes into the exhaust box, and at the same time blows off any material which may have adhered to the sides of the passing cans.

Secured on the upper ends of the standards 33 are the T irons 37 upon and between which the cans 38 rest on their journey through the exhaust box.

The transverse shafts 39 journal in the bearings 40 and carry the worm wheels 41 which are driven by the worms 42 on the shaft 43 which journals in the bearings 44 on the cross ties 22. The shaft 43 may be driven in any convenient manner. The eccentrics 45 on the shafts 39 are provided with straps 46 into which are set the vertical rods 47. On the upper ends of the rods 47 are placed the blocks 48 which are joined transversely in pairs by the angle irons 49. Pairs of T irons 50 and 51 are formed into I beams by the plates 52 which hold

the upper side of the members 50 above the can-supporting portions of the members 37 when the eccentrics 45 are in raised position. Since the rods 47 are rigid in relation to the members 50 it will be seen that they form a table whose legs are the eccentric rods 47 which require no guides. On top of the members 50 are placed the sheet metal strips 53 which have the upturned lugs 54 which engage the rear sides of the cans and push them forward when the members 50 are in the forward travel. It will be observed that the lugs 54 are inclined slightly to prevent same from striking the under side of the cans on the upward travel of the lugs, as the can is thereby given an additional forward push equal to the amount of the incline. Walls 55 are formed around the holes in the floor 28 through which the rods 47 pass.

Referring to the receiving or feeding section of the device, it will be seen that we have provided the two upright channels 56 which are tied to the posts 20 by the ties 24, 57, 58 and 59, and to each other by the ties 60, 61 and 62. Opposite the tie 62 and secured to the posts 20 is a tie 63 both of which are slightly below the level of the can-supporting portion of the members 37. Supported at the same height is a table 64 whose sides are a short distance from the ties 62 and 63 to permit the links of the chain 65, which has the diamond-shaped attachments 66, to pass between same, and having the diamond-shaped portions 66 ride on the members 62, 63 and 64. The top of the diamond-shaped attachment is slightly higher than the can-supporting portion of the members 37. The chain 65 is carried by the sprockets 67 and 68. The former is mounted on the shaft 69 supported by the journal 70 below which is placed a collar 71. The sprocket 68 is mounted on the vertical shaft 72 which journals in the bearings 73 and 74. A bevel gear 75 is pinned on the shaft 72 below the bearing 74 and meshes with the bevel gear 76 on the shaft 77 carried by the bearings 78 and 79 which are supported by the tie 24. A collar 80 is pinned on the shaft 77 against the bearing 78. The bevel gear 81 on the shaft 77 meshes with and is driven by a similar gear 82 on a shaft 39.

The bevel gear 83 on the shaft 72 meshes with and is driven by the gear 84 on the shaft 85 carried by the brackets 86. The gear 87 on the shaft 85 drives the gear 88 on the vertical shaft 89 carried by the bearings 90 and 91. On the lower end of the shaft 39 is secured a segment gear 92 which meshes with the pinion 93 on the shaft 94 which journals at its lower end in the bearing 95 and at the upper end in the table 64 and has secured to its upper end a crank 96 bearing at the outer end a roller 97.

Pivoted on the vertical shafts 98 are the rocker arms 99 whose ends carry the rollers 100.

The arms 101 on the lower ends of the shafts 98 are joined by the connecting rod 102 which is urged by the spring 103 toward the sprocket 67. Placed over the members 99 is a pusher bar 104 having an extending strip 105 attached thereto. The bar 104 is provided with the slots 106 which receive the rollers 100. These tend to force the strip 105 away from the exhaust box and hold same parallel to its end. The bar 105 is also provided with a long projecting arm 107 and a short arm 108 between which the roller 97 operates. On the shafts 69 above the sprocket 67 we have placed a spacer wheel 109 having notches 110 cut into its periphery at a distance and number equal to the spacing of the members 50.

Mounted against the post 56 is a spring-urged arm 111 which prevents any can traveling along on the members 66 from being crushed by its failure to find a notch 110 in the wheel 109, thereby rendering the position in which the cans are placed on the chain 65 unimportant.

A hood of sheet metal having the sides 112 and the top 113 covers the receiving section of the machine, except over the loading and spacing portion of the chain 65. A bar 113^A forms a stop for the cans in front of the wall 112. It will be understood, of course, that an opening 114 must be provided in the side 112 to permit the cans to enter the exhaust box.

Turning now to the discharge end of the machine, it will be observed that it consists of two upright posts 56^A secured to the exhaust box section by the ties 24, 115 and 116 and to each other by the angle iron ties 117 and 118. The tie 119 joins the nearest post 20 and is opposite the tie 118. A channel 120, similar to the channel 120^A under the receiving table 64, supports the discharge table 121 at the same height as the members 118 and 119. A chain 122 with diamond-shaped attachments 123 travels around the table 121 and is carried by the sprocket 124 on the shaft 125 and by the sprocket 126 on the shaft 127 which journals in the bearings 128 and is driven through the miter gears 129 from the shaft 130 which journals in the bearings 131 and is, in turn, driven by the miter gears 132 from a shaft 39.

A sheet metal covering 133 is provided for the discharge end of the exhaust box, which covering has an opening 134 for the exhaust of the cans 38.

The operation of our device is as follows: Steam is allowed to enter the exhaust box through the pipe 35 until the desired temperature is reached and maintained. The shaft 43 is then rotated by power and un-

sealed cans of fruit from which it is desired to exhaust the air are placed on the conveyor members 66, as shown in Fig. 6, and carried by same to the spacer wheel 109 which rotates continuously. This places the cans at uniform distances on the chain which carries, in this particular machine, ten cans in front of the exhaust box. By the time these cans are almost directly in front of their individual channels in the exhaust box, the segment gear 92 comes into mesh with the pinion 93 and a quarter turn of same moves the pusher bar 104 and the strip 105 against the row of cans and pushes them in a slightly diagonal direction into the ten channels of the exhaust box. The eccentrics 45 now raise all of the cans in the exhaust box and move them toward the discharge end one space, or the distance between the pairs of lugs 54. The strip 105 is now carried to the right out of the way of the oncoming cans which have been spaced by the wheel 109 and then is moved behind them to the position shown in Fig. 5, when it is ready to repeat the operation.

At the discharge end the cans merely slide out to the members 123 by which they are carried out of the steam and taken off in the most convenient manner. It will be seen that inasmuch as each can travels through the machine at a uniform rate of speed that the time for exhausting the air out of the fruit can be controlled to a nicety. It will also be observed that the working parts of the machine are arranged so as to permit ready replacement and to offer the minimum amount of exposure to steam all parts most liable to give trouble.

It will also be understood that while we have illustrated only one unit of the exhaust section that in the proportions given in the drawings three such units are required to provide the capacity common for machines of this nature.

The can-engaging side of the arm 111 is preferably knurled or provided with a friction face such as rubber or other substance which will cause a can to rotate into one of the notches rather than to slide along the face of the arm with possible undesirable results.

We are aware that many forms of exhaust boxes have been constructed in the past; it is not therefore our intention to cover this device broadly but intend that it shall cover only such forms and modifications as may fall fairly within the appended claims.

What we claim as new is:

1. An exhaust box for canned goods having straight channels passing through a heated compartment adapted to hold cans vertically for exhaust purposes, in combination with horizontal shifter bars in the central portion of each of said channels, upwardly and rearwardly inclined lugs along each side of each shifter bar, said bars being adapted to raise said cans from the floors of said channels, move same forward and then set said cans upon the floors of said channels repeatedly until said cans have traversed the length of said channels.

2. An exhaust box for canned goods having straight channels passing through a heated compartment adapted to hold cans vertically for exhaust purposes, in combination with horizontal shifter bars in the central portion of each of said channels, upwardly and rearwardly inclined lugs along each side of each shifter bar, said bars being adapted to raise said cans from the floors of said channels, move same forward and then set said cans upon the floors of said channels repeatedly until said cans have traversed the length of said channels, and means for placing one can in each channel at the same time the first place in each channel is empty.

3. In an exhaust box, the combination of a heated compartment, channels passing through said compartment, a horizontally movable shifter bar in the center of each channel, said bars having backwardly sloping projections spaced along each edge, an eccentric under said movable bars adapted to raise same above the floor of said compartment in one direction and to press same beneath said floor in the opposite direction, and a can spacing means adapted to space the cans to correspond with the spacing of said channels.

4. The combination of an exhaust box having a heating device with a continuously moving conveyor in front of the inlet of said box, means for spacing cans on said conveyor, a pusher bar over said conveyor adapted to push a row of cans from said conveyor into said exhaust box said bar having a straight front face and having a pair of longitudinal slots formed therein and having a pair of spaced arms of unequal length projecting from its rear side, a pair of connected roller carrying rocker arms under said pusher bar said rocker arm having rollers which lie in said longitudinal slots so as to hold said bar parallel to said conveyor, an intermittently driven crank arm having a roller on its swinging end adapted to engage said bar between said unequal arms and to move said bar forward and to the right during the first quarter of its rotation, slide said bar to the right during the second quarter of its rotation, and to move said bar to the left during the third and fourth quarters of its rotation to a point of rest, and a spring on said connected arms adapted to urge said push bar backwardly at all times.

5. The combination of an exhaust box having longitudinal can-holding slideways

formed therein, horizontal shifter bars for raising cans from said slideways and moving same a short distance at a time, sloping projections on each side of said shifter bars adapted to impart excess movement to the cans, with a feed mechanism consisting of a continuously moving conveyor, a can spacing wheel over said conveyor, a spring-urged guide for delivering cans to said spacing wheel, a can pushing bar adapted to move a row of cans from said conveyor into said slideways at one time, and a discharge device consisting of a continuously moving conveyor adapted to receive cans being discharged from said slideways.

6. The combination of an exhaust box having a plurality of can-holding slideways formed therein, a conveyor for carrying cans in front of said slideways, a spacing mechanism for spacing said cans equi-distantly with said slideways consisting of a wheel over said conveyor having notches formed in its periphery equal in spacing with said slideways, and a resilient guide member adapted to roll said cans vertically against said notched wheel over the center of said conveyor.

7. An exhaust box having a plurality of fixed slideways, in combination with a plurality of parallel horizontal shifter bars adapted to pass through the bottoms of said slideways, eccentrics adapted to move said shifter bars in unison, and backwardly sloping lugs rising over said shifter bars adapted to engage the rear side of every can and insure excess movements of the cans in the slideways.

8. The combination of an exhaust box having a plurality of longitudinal slideways mounted therein, with a continuously moving chain conveyor moving around a pair of sprockets at the inlet end of said box, said chain having horizontal portions formed thereon adapted to support cans vertically, a spacer wheel on one of said sprockets having as many notches as there are slideways in said exhaust box, a flexible friction arm adapted to roll cans from one run of said conveyor into said notches, a parallelly moving push bar above said conveyor behind said spaced cans, a crank for actuating said push bar intermittently, a segment gear and pinion adapted to actuate said crank in a fixed relation to the travel of said conveyor and to the position of the cans thereon so that an entire row of cans will be placed one each in said slideways at one operation, and a discharge conveyor across the discharge end of said box.

9. In an exhaust box, the combination of a steam-heated box provided with a plurality of longitudinal can-holding channels, horizontal shifter bars adapted to pass upwardly and forwardly through said channels, a conveyor adapted to convey cans in front of said channels, a spacer wheel arranged to space said cans equi-distant to said channel spacings on said conveyor, a push bar arranged to push a row of cans into said channels so that one can will be placed in each channel whenever the first space in each channel is empty, and means for receiving said cans from the discharge end of said box.

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