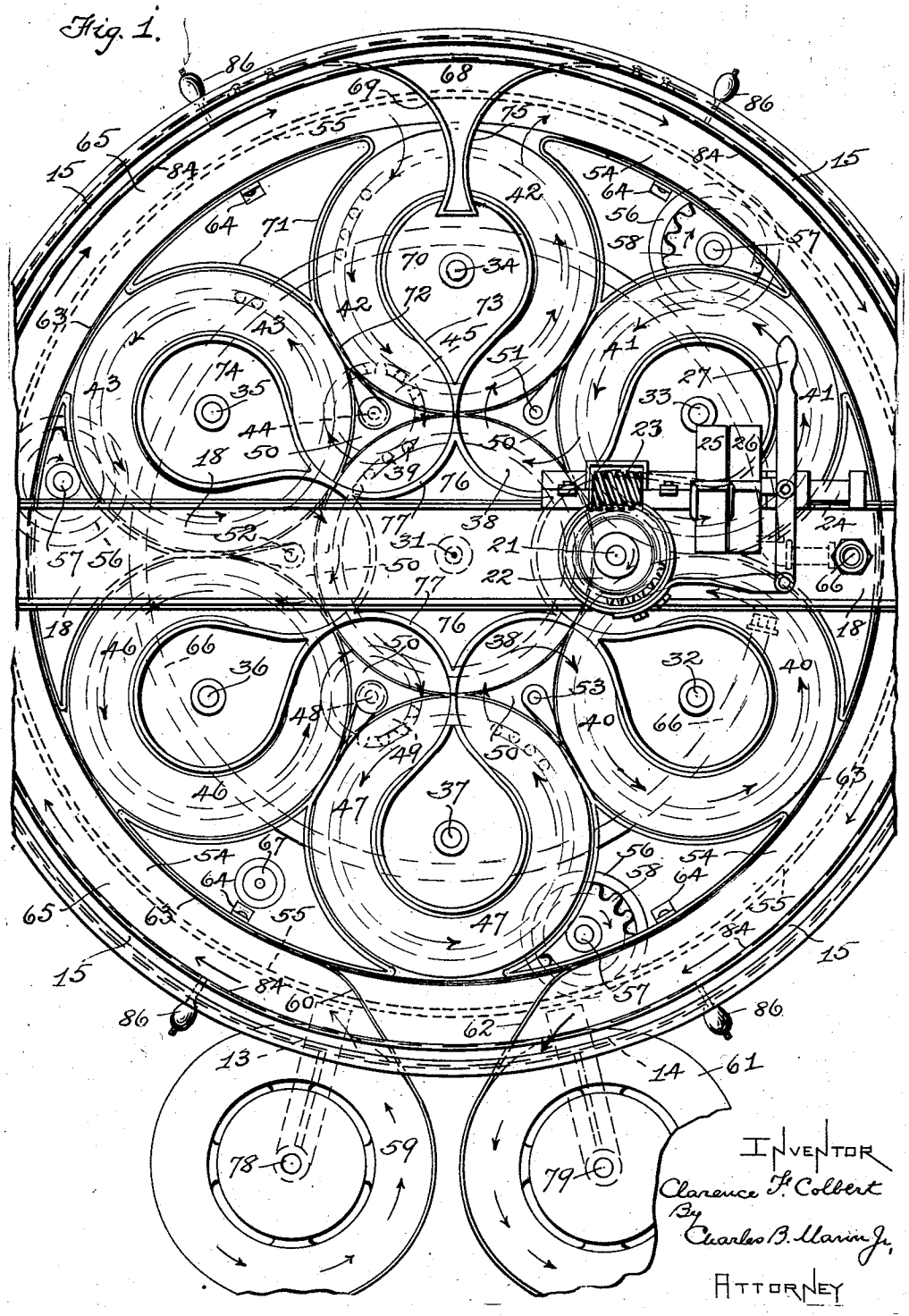
June 3, 1930. C. F. COLBERT 1,762,129

EXHAUSTER FOR CANNED GOODS

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Fig. 1.



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EXHAUSTER FOR CANNED GOODS

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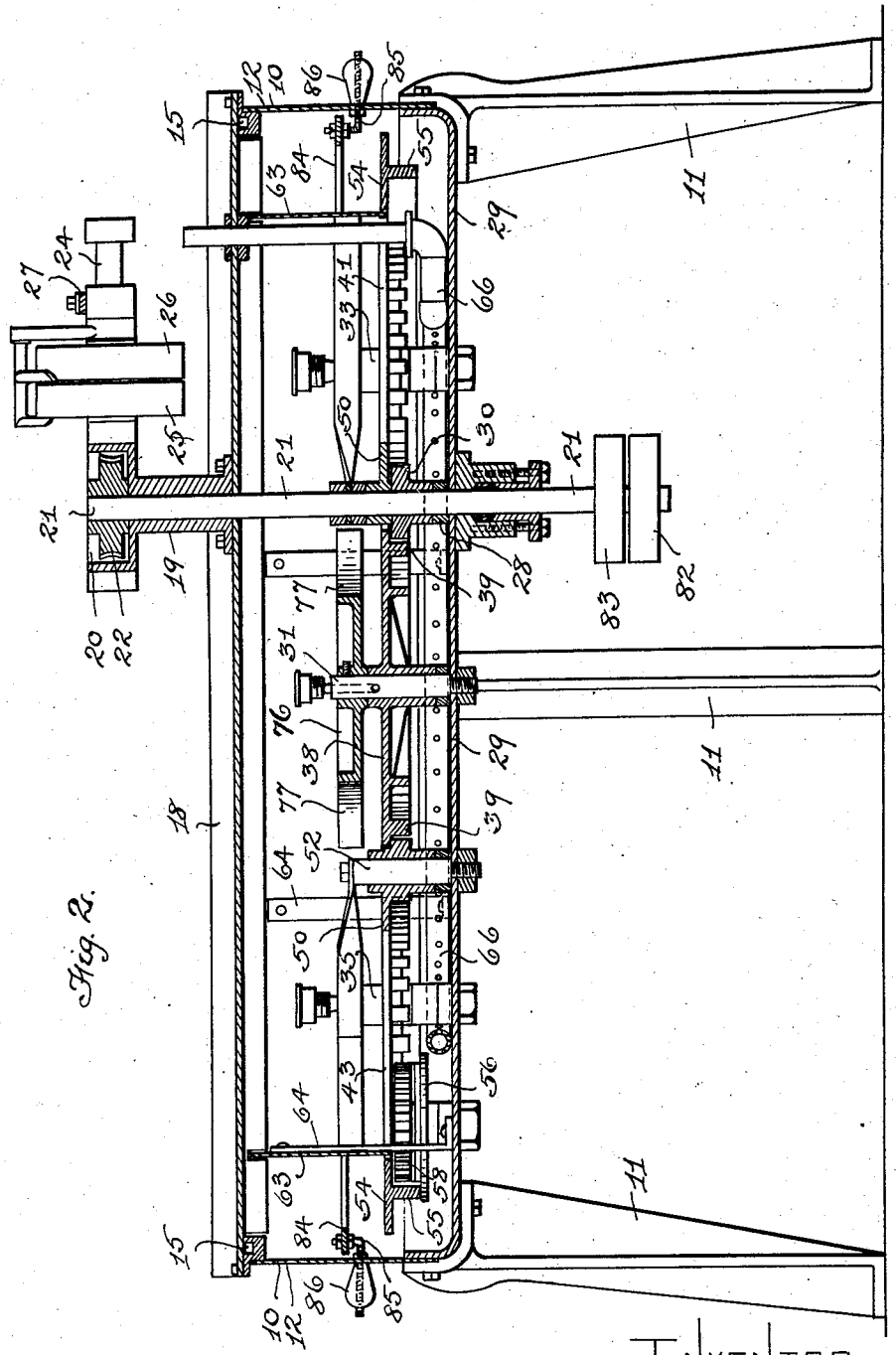


Fig. 2.

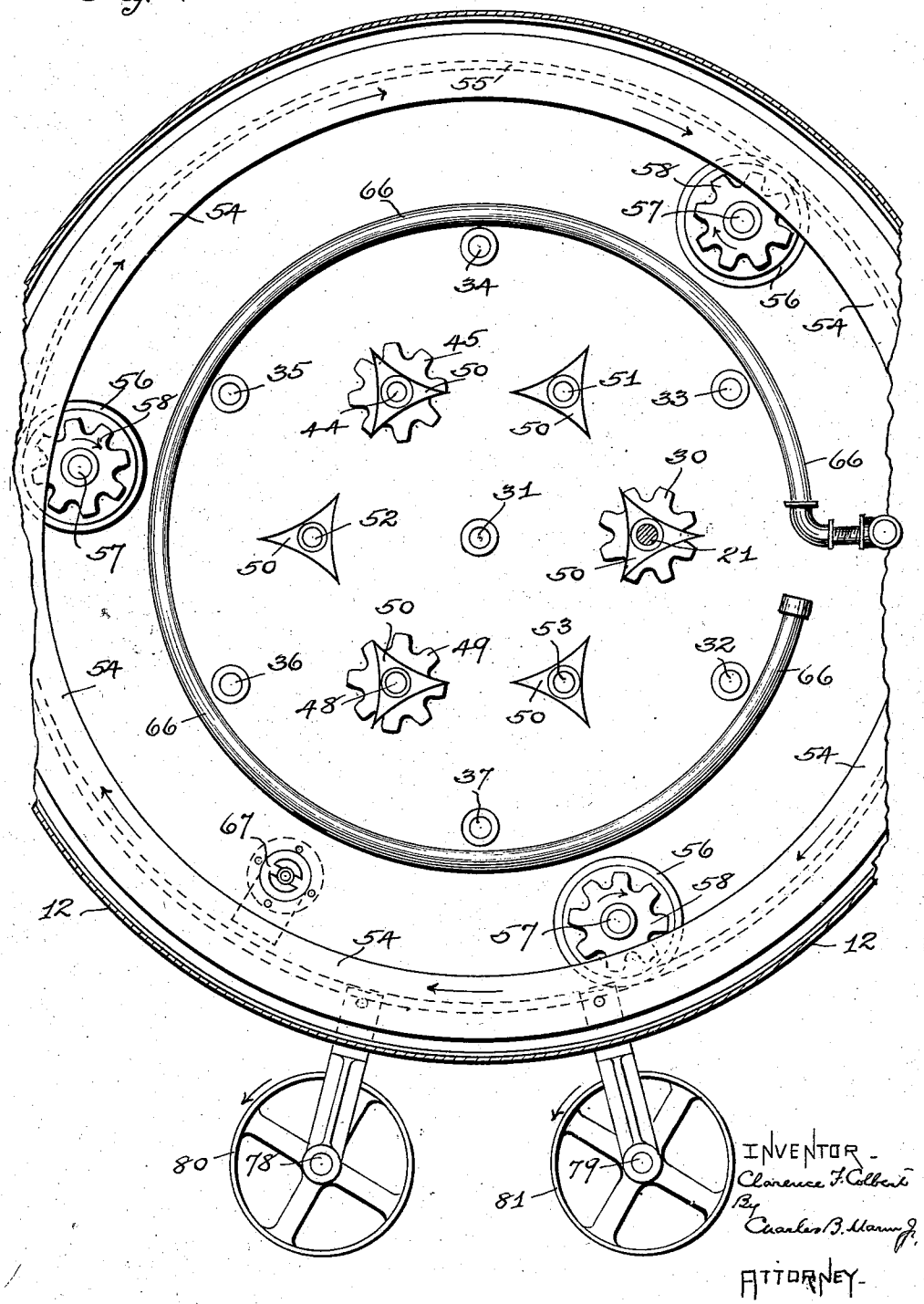
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EXHAUSTER FOR CANNED GOODS

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Fig. 3.



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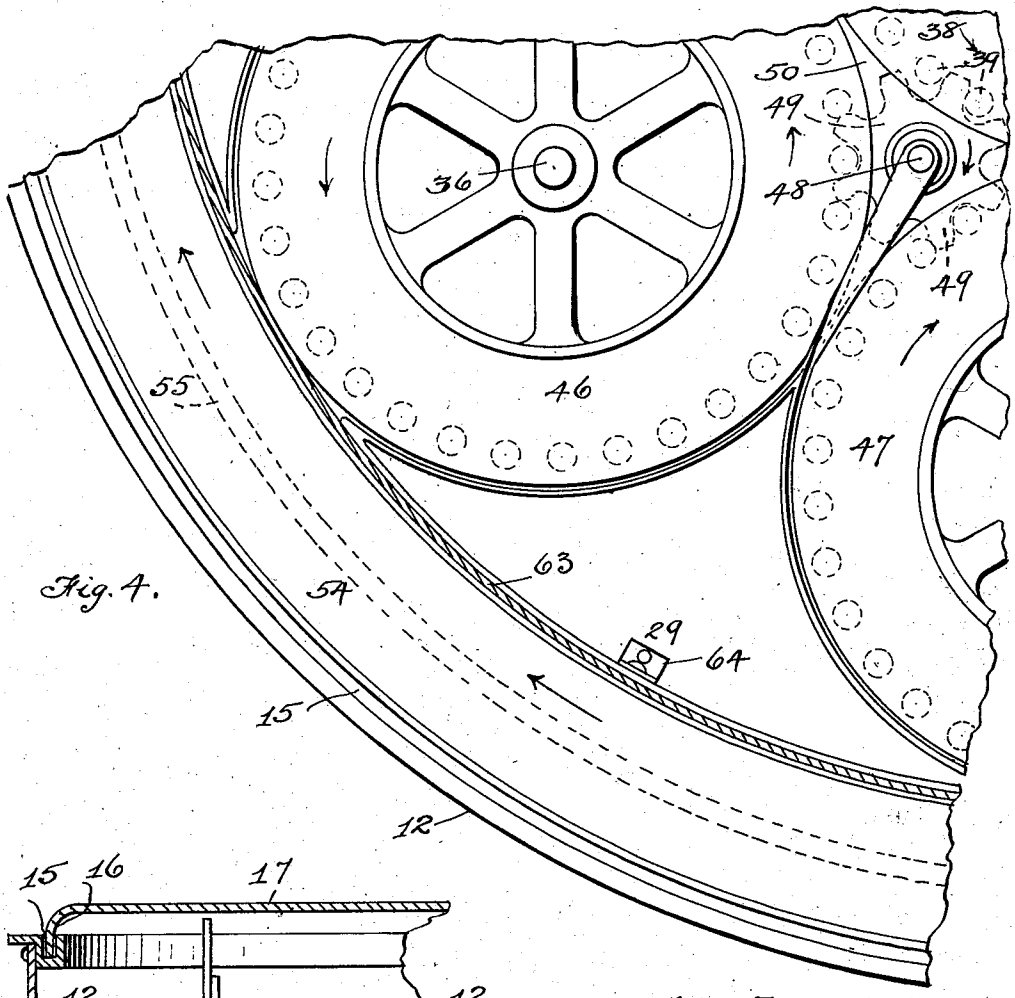


Fig. 4.

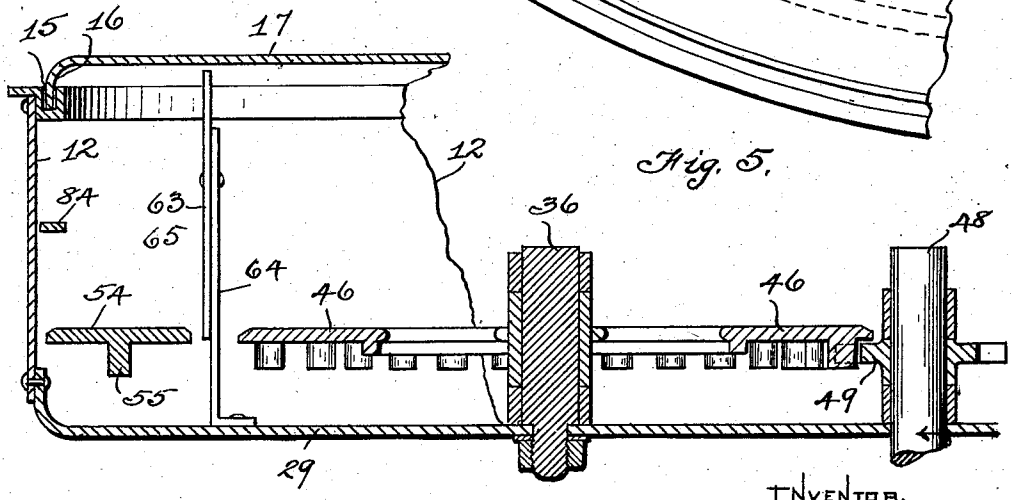


Fig. 5.

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UNITED STATES PATENT OFFICE

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EXHAUSTER FOR CANNED GOODS

Application filed September 13, 1928. Serial No. 305,696.

This invention relates to improvements in canning machines and is more particularly known in the canning art as an exhauster, in that it is designed to receive cans which have been filled, but not capped or headed, and by heating the contents of the cans expel or exhaust the air from the cans prior to their final closure.

The main objects of the present invention are to provide an improved machine, which may be installed in a line with filling machines whereby the filled, but open-end cans may be passed through the exhauster without interruption and as fast as they are supplied by the fillers; to provide an improved machine whereby the heat container therein will be checked from direct escape at the entrance and discharge openings and that by improved means, the filled cans will be caused to travel in a circuitous route through the exhauster while passing from the entrance to the discharge.

With these, and other objects in view, the invention is illustrated in the accompanying drawings, wherein,—

Fig. 1 shows the machine in top view,—the cover being removed.

Fig. 2 shows the same in central vertical cross-section.

Fig. 3 illustrates another plan view showing the stud shafts and gears directly over the bottom of the machine; the turn table and rollers that support and rotate it and the steam pipe on the bottom.

Fig. 4 illustrates, on an enlarged scale, and in plan one group of three can carriers with the transmission gear between them, with the turn-table and its compartment around them and the guides for holding the cans and directing them from one carrier to another, and

Fig. 5 shows a vertical sectional detail through a portion of the exhauster-casing and its cover, and also through the turn-table; a portion of one can carrier and its actuating gear.

In carrying out the invention there is provided a circular shell 10, supported in an elevated and horizontal position by suitable legs 11.

The shell has an annular outer vertical wall 12 with inlet and exit openings through the side thereof at 13 and 14 respectively.

The upper edge of the outer annular wall 12 has an annular reinforcing ring attached thereto and this ring is provided on its upper edge with an annular groove 15 for water whereby it may receive the rim edge 16 of a cover member 17, and thus effect a sufficiently tight seal around the edge of the cover to prevent the escape of an appreciable quantity of steam which it is desired to retain in the shell as will presently more fully appear.

A horizontal channel beam 18, extends diametrically across the top of the shell, from one side to the other, so that the driving shafts and pulleys may be conveniently carried thereby, and the cover-members, of which there are preferably two semi-circular parts, are hinged to the sides of the channel beam so as to swing down on the top ring.

On top of the channel beam 18, there is a vertical casting 19, having a circular horizontal recess 20 at the upper end thereof, (see Fig. 2) and a main vertical drive-shaft 21 extends down through this casting and passes through the shell of the exhauster and extends below the bottom of the latter.

The upper end of this vertical drive-shaft 21, carries a worm-gear 22 which latter is enclosed in the recess 20, and a worm 23 on a horizontal pulley-shaft 24 drives the worm-gear 22 and vertical shaft.

Fast and loose pulleys 25 and 26 on the shaft 24 enable the latter to be driven by a belt or permit said shaft to remain idle as desired through the operation of a belt-shifting means including a lever 27.

The main vertical shaft 21 passes through a collar 28, which latter seats on the bottom 29 of the shell and just above this collar, the said shaft carries a gear 30 which revolves in a horizontal plane as shown in Fig. 2.

The bottom 29 of the exhauster shell is provided with a central vertical post 31 and a series of similar posts 32, 33, 34, 35, 36 and 37 all of which posts of said series are arranged in a circular path about the said central post 31, and all of said posts, in the present instance, are stationary.

On the central vertical post 31, there is

mounted a horizontal rotary disk 38. This central disk is provided on its under side with a continuous series of depending pins 39 having the function of teeth, and the diameter of the disk 38 is such, that these depending pins 39 are engaged by the horizontal gear 30 on the vertical shaft 21 so that as said gear 30 is revolved, it will drive the center disk in a reverse direction.

On vertical post 32, there is mounted another horizontal carrier-disk 40 while on post 33 there is a similar carrier-disk 41. These two carrier-disks also have pins depending from their under sides and serving as teeth and the diameters of these disks are such that their depending teeth or pins will also be engaged by the teeth of gear 30 so that the three disks 38, 40 and 41 will all be driven or revolved by the one gear 30 on the vertical shaft 21.

These three disks, 38, 40 and 41 all have position in the same horizontal plane, so that cans may be passed from one disk to another during their travel through the shell as will presently more clearly appear.

On posts 34 and 35 are mounted two more carrier-disks 42 and 43, and these disks also have pins depending from their under sides. These disks are also arranged in the same horizontal plane as the center and the side disks 40 and 41, and the peripheries of all the disks travel close to the periphery of the center disk.

Between the disks 42, 43 and the center disk 38, as shown in Fig. 1 of the drawing, there is a vertical post 44, on which there is a horizontal gear 45.

This latter gear engages the teeth or pins 39 on the central disk and also engages the teeth or pins on the under sides of the disks 42 and 43 so that as the center disk 38 is revolved, its teeth will drive the gear 45, and the latter will then drive the carrier disks 42 and 43.

Posts 36 and 37 sustain carrier-disks 46 and 47 which, like the other disks, have depending pins or teeth on their bottoms. The peripheries of these disks also travel close to the periphery of the center disk and these disks are also in the same horizontal plane as the central disk.

Between these disks 46 and 47, there is another vertical post 48 on which a gear 49 is mounted and this gear 49 engages the pins or teeth 39 on the center disk and is driven by that disk. The teeth of this gear 49 also engage the pins or teeth on the two disks 46 and 47 and thus drive these two disks as the center disk 38 is driven.

It is thus to be understood that the center disk 38 and the two disks 40 and 41 are driven by the gear 30 on the main vertical shaft; that center disk 38 drives gear 45; that gear 45 in turn drives disks 42 and 43; that the center disk also drives gear 49 and that this latter gear (49) then drives disks 46 and 47.

It will be noted, by reference to Fig. 1, that substantially triangular spaces are formed between the center disk and adjacent disks of the surrounding series of disks and that I provide substantially triangular filler-blocks 50 to fill these spaces and form a flush supporting surface with the peripheries of the three disks which cause those spaces.

Three of these triangular blocks are mounted, one on the main vertical shaft 21 and one on each of the posts 44 and 48, while the other three blocks are mounted respectively on posts 51, 52 and 53 which extend vertically from the bottom 29 of the exhauster shell.

The blocks carried on the main shaft and on the posts 44 and 48 have positions directly over the gears 30, 45 and 49 respectively.

Before discussing the means for directing or guiding the cases from one disk to another, other features of the machine will first be explained.

In carrying out the invention, I provide a ring-carrier or turn-table 54, which travels about the entire series of carrier-disks and has position directly at the inner side of the annular vertical wall 12 of the exhauster-shell.

This ring is preferably cast in a continuous ring-shape and has a central depending web 55, extending down from its under side, as shown in Figs. 2 and 5 of the drawings.

The ring is supported on the flanges of a plurality of horizontally disposed wheels 56. These wheels are carried on vertical posts 57 and the central bottom web 55 merely seats upon the wheel flanges which not only support the ring but which, when the wheels are revolved cause the ring to travel horizontally and about the circular wall of the shell in the direction of the darts shown in Fig. 1.

Each wheel 56 has a series of teeth 58 which latter mesh with and are driven by the pins or teeth on the under sides of the carrier-disks, for example, disks 41, 43 and 47, so that in the present instance, the drive of the ring-carrier is entirely one of friction, although the invention is not to be restricted in this respect.

It has hereinbefore been pointed out that there are inlet and exit openings 13 and 14 to and from the annular wall 12 of the shell through which cans may be fed to and removed from the exhauster.

It is immaterial to the present invention just where these openings are situated or their relative positions, but in the present instance, they are shown adjacent to each other.

At the inlet opening 13, there is provided a carrier-disk 59 on the same horizontal plane with the carrier-ring 54 so that cans may be carried by the disk 59 and directed by a ver-

tical guide-plate 60 through the opening 13 and onto the carrier-ring.

In a similar manner, there is provided a carrier-disk 61 at the outlet 14 from the shell and a guide plate 62 directs the cans laterally through the outlet-opening from the ring onto the disk 61.

On the interior of the exhauster-shell and immediately at the inner circumference of the carrier-ring 54, there is provided a vertical partition wall 63 which is supported by suitable brackets 64 that extend up from the bottom 29 of the shell.

In this instance, this vertical partition wall 63 extends around the interior of the shell from one side of disk-carrier 42, all the way around, past the two openings 13 and 14, to the other side of the disk-carrier 42.

The provision of this partition forms an annular ring-carrier chamber 65, from the inlet-opening 13 around to the carrier-disk 42 and from the outlet-opening 14 also around to the carrier-disk 42.

The reason this partition extends to the carrier-disk 42 is that the cans are fed from the ring-carrier to the series of disks at disk 42, and are also fed from the series of disks back to the ring-carrier at disk 42.

The purpose of this partition 63 is to cut off communication directly from the space over the carrier disks to the inlet and exit openings so that the steam which is continuously admitted to the interior of the shell will not have a direct escape through said openings 13 and 14 and thus cause an unnecessary waste of steam heat.

The cans must therefore be carried substantially half way around the shell on the ring-carrier before they are discharged from the ring and started on their circuitous route through the exhauster, after which they are again fed onto the ring at substantially the point where they left it, and continue their travel with the ring for the remainder of the circuit to reach the exit-opening 14.

A steam pipe 66 is provided in the lower part of the exhauster shell which pipe has a series of perforations therein whereby steam may be discharged in the shell to effect a heating of the same and also to heat the cans and their contents as they travel through the exhauster.

Of course, water of condensation will accumulate in the exhauster shell and the latter is therefore provided with a valved overflow 67, by which excess water may escape.

When the filled cans are fed onto the ring-carrier from the carrier-disk 59, those cans will be conveyed by the ring-carrier around through the chamber 65 until the cans contact with a director plate 68 (shown in Fig. 1) which projects from the annular wall of the shell and extends over the ring-carrier 54 and also over the disk-carrier 42. This director plate has an edge 69 which curves inwardly over the disk-carrier and causes the filled cans to be diverted and transferred from the moving ring-carrier onto the rotary disk-carrier 42, so that the cans will be diverted and moved onto said carrier 42.

Over this carrier and mounted on the post 34, is a stationary guide-plate 70 which keeps the cans away from the center of the revolving carrier and compels them to assume positions on top of the carrier near the outer periphery of the latter, and to prevent those cans from overhanging the outer edge of the said carrier 42, there is provided a curved guide-bar 71 which is supported by the same brackets 64 which sustain the partition wall 63. The inner end of the guide-bar 71 however is given a quarter-twist as at 72, and is then bolted down on top of the post 44 on which the gear 45 is mounted.

This guide-bar 71 therefore extends around the periphery of the carrier disk 42 and prevents the filled cans from shifting on the top of the disk while they are being transferred and also keeps the cans in a single file during their travel.

The stationary guide-plate 70, has a reversely-curved guiding-edge 73 which directs the cans from the disk 42, over the filler-block 50 and onto a portion of the reversely-traveling center disk 38, which latter causes the cans to shift their direction of travel and moves them around the post 44 and onto the disk-carrier 43.

The cans therefore travel in the direction of the darts shown in Fig. 1.

When the cans have been diverted from the disk 42 to disk 38, and then to disk 43, the guide-bar 71 again serves to keep them from overhanging the periphery of the disk 43 while a stationary guide-plate 74 over disk 43 and carried on post 35, keeps the cans in a single file as they travel around with said disk 43.

The same operation takes place in transferring the filled cans from the disk 43 to center disk 38 to disk 46, where the same form of center and side guides cause the cans to travel in a circuitous path,—always following the direction of the darts and always being aided by a portion of the center disk 38 when transferring from one of the annular series of disks to the next disk of the series.

The circuitous travel of the cans through the exhauster from one disk to another with the aid of a single center disk continues until the cans again arrive at the deflector-plate 68, where the cans then engage the curved edge 75 of the plate 68 and are returned to the ring-carrier which then conveys the cans around the carrier passage or chamber to the point of discharge or exit where the guide-plate 62 directs them out and onto the disk 61, from which they are conveyed by any suitable means to a place where the next operation in the canning process is carried out.

It is therefore to be understood that the filled cans enter the exhauster and are deposited on a ring-carrier which conveys them to a point where they are deflected and conveyed through a steam-heated chamber in an annular circuitous path by means of an annular series of disk-carriers and a central transfer disk-carrier, during which travel the heat exhausts the air from the canned goods and that the cans are then discharged and sent to a header where they are permanently closed.

The stationary guide-plates such as 70 and 74, which are mounted over the several disk-carriers are elevated above the surfaces of the carriers so that the steam from below may be directed against the cans as it ascends, and thoroughly heat the latter.

It will be noted by reference to Figs. 1 and 2 that over the central disk-carrier 38, there is a guide plate 76 having a series of curved edges 77 each of which curves coacts between the center disk and two of the annular series of disks to effect the transfer of the cans.

The carrier-disks 59 and 61 at the inlet and exist openings 13 and 14, are carried on vertical shafts 78 and 79, and these shafts have pulleys 80 and 81 so that belts (not shown) may be passed around said pulleys and also around pulleys 82 and 83 on the lower end of the main drive shaft 21 in order that said shafts 78 and 79 and the carrier disks 59 and 61 may be continuously revolved.

The machine is designed to accommodate cans of various sizes and to prevent them from assuming a staggered arrangement on the outer ring-carrier 54, and thereby becoming wedged between the outer wall of the shell and the annular partition wall 63, there is provided an adjustable horizontal guide-rail segment 84 which latter is supported on bolt-brackets 85, which pass through the shell wall, as shown in Fig. 2.

These segment guide rails 84 are elevated above the ring-carrier 54 and engage the circumference of the cans as the latter move along with the ring-carrier provided said cans are not in proper position on the ring-carrier.

By turning on the threaded body 86, the bolt-brackets may be moved inwardly or outwardly through the shell wall and thereby adjust the position of the guide rail.

Having described my invention, I claim:—

1. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of carrier disks to receive and advance the cans through the chamber and rotary means for transferring the cans from one disk of the series of disks to the next adjacent disk of said series of disks.

2. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of carrier disks to receive and advance the cans through the chamber and rotary means coacting with all of the disks of said series to transfer the cans from one disk to another of said series of disks.

3. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of carrier disks arranged annularly in the chamber to advance the cans through the latter and means located within the annular series of disks for transferring the cans from one disk of the annular series to the next disk thereof.

4. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of carrier disks arranged annularly in the chamber to advance the cans through the latter and a rotary disk at the center of the annular series of disks for transferring the cans from one disk of the series to the next disk thereof.

5. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of carrier disks arranged annularly in the chamber to advance the cans through the latter, a rotary disk at the center of the annular series of disks for receiving the cans from one disk of the series and advancing them toward the next disk of the said series and guide means coacting with the center disk to direct the cans from one disk of the annular series onto the center disk and from the center disk onto the next disk of the annular series of disks.

6. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a series of rotary disks arranged annularly in the chamber with the periphery of one disk of the series adjacent to the periphery of the next adjacent disk of the series, a central rotary disk having its periphery in close proximity to the peripheries of all the disks of the said annular series,—all of said annular series of disks discharging cans onto the center disk and means for guiding the cans from each of the disks of the annular series onto the center disk and from the center disk onto the next disk of the annular series of disks.

7. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a ring carrier extending around the chamber to receive cans at said inlet and to deliver cans at said outlet and a series of carrier disks to receive cans from the ring carrier and advance them through the chamber and again deliver them to the said ring carrier to be conveyed to said outlet.

8. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a ring carrier extending around the chamber to receive cans at said inlet and to deliver cans at said outlet, an annular series of rotary disks

having independent axes all located within the ring carrier, means for transferring cans from one disk of the annular series to the next adjacent disk of said series and means for transferring the cans from the annular series of disks back onto the ring carrier to be conveyed to the said outlet.

9. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a ring carrier extending around the chamber to receive cans at said inlet and to deliver cans at said outlet, a series of rotary carrier disks to receive the cans from the ring carrier and convey them in a circuitous route through the chamber and means for revolving the ring carrier from the rotary disks.

10. In an exhauster for canned goods the combination with a heating chamber having an inlet and an outlet for cans, of a ring carrier extending around the chamber and passing said inlet and outlet, an annular series of rotary disks whose axes are arranged in separate vertical planes with respect to the center of the ring carrier, means for transferring cans from the ring carrier to one disk of the annular series of disks, means at the center of all of the disks of the annular series of disks to transfer the cans from one disk of said annular series to the next adjacent disk of said series and means to transfer the cans back onto the ring carrier to be delivered at said outlet.

11. In an exhauster for canned goods the combination with a shell having an inner heating chamber and a partition between said inner chamber and the outer wall to form an outer ring carrier chamber with an opening from the latter chamber to the inner heating chamber and with inlet and outlet openings to and from the outer ring carrier chamber for cans, of a ring carrier in the outer chamber, a series of rotary carriers in the inner heating chamber, means for transferring cans from the carrier in the outer chamber to a carrier in the inner heating chamber, means for transferring cans from one carrier to another in the inner chamber and means for again transferring the cans from the carriers in the inner chamber to the ring in the outer chamber to be delivered at the outlet.

12. In an exhauster for canned goods the combination with an annular shell having an inlet and an outlet for cans, of a central carrier disk in said shell, a series of carrier disks each with its axis in a different vertical plane and arranged about the center disk so that the peripheries of the series of disks will all revolve adjacent to the central disk, a partition in the shell between the series of carrier disks and the outer wall of the shell to form an inner heating chamber in which all of the disks revolve, a ring carrier revolving in the space between the partition and the outer wall of the shell and traveling past the inlet and outlet openings of the shell, means for transferring cans from the ring carrier to the disks in the inner heating chamber and means for transfering cans from the series of disks back onto the ring carrier.

13. In an exhauster for canned goods the combination with an annular shell having inlet and outlet openings for cans, of a center carrier disk in the shell, an annular series of disks of uniform diameter arranged about the center disk, means for rotating all of the disks in the same direction, a ring carrier about the annular series of disks and traveling past the inlet and outlet openings of the shell, means for revolving the ring carrier in a direction reverse to that of the annular series of disks, means for transferring cans from the ring carrier to one disk of the annular series of disks, means for transferring the cans from one disk of the annular series to the next disk of said series and means for transferring the cans from the annular series of disks back to the ring carrier to be conveyed to the outlet.

In testimony whereof I affix my signature.

CLARENCE F. COLBERT.