

J. HAUK, JR.
STERILIZING APPARATUS.

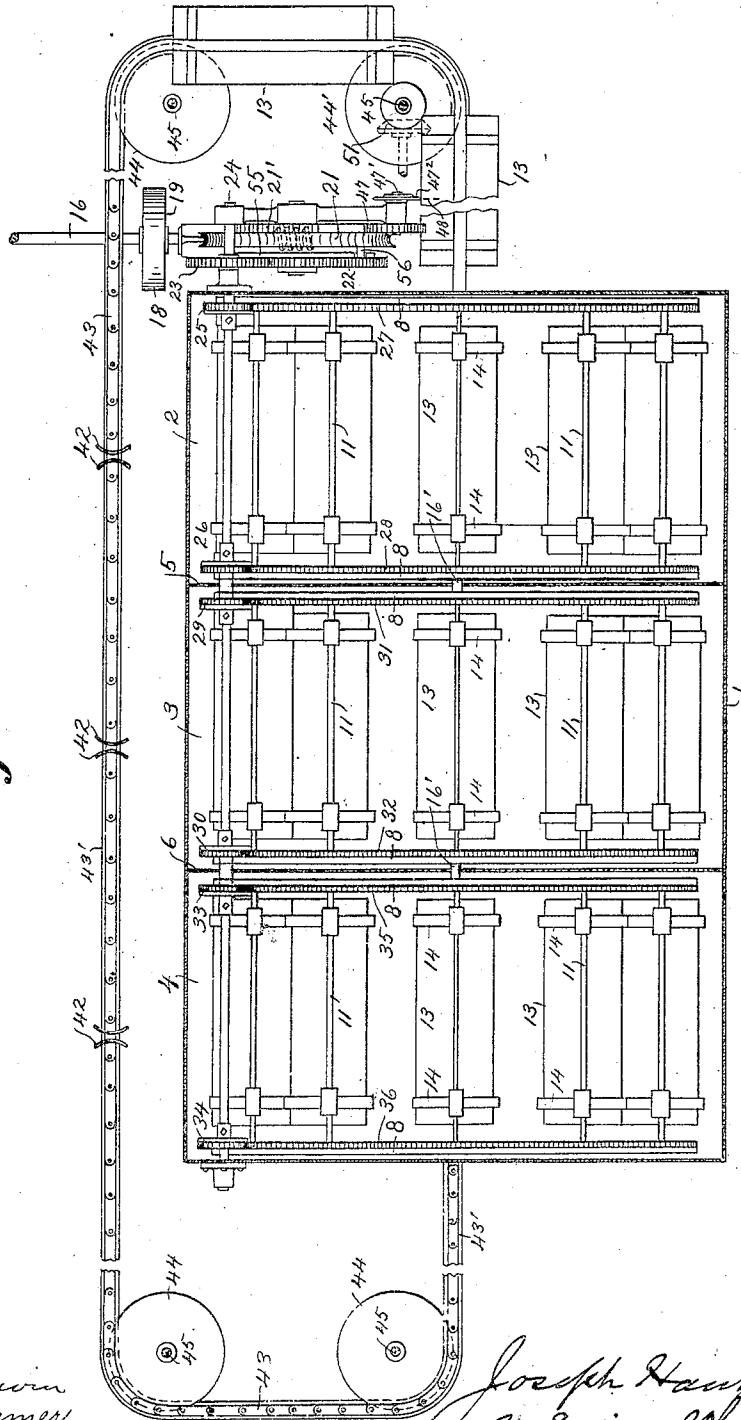
APPLICATION FILED FEB. 15, 1909. RENEWED JUNE 24, 1912.

1,037.247.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 1.

Fig. 1.



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Witnesses

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6 SHEETS—SHEET 2.

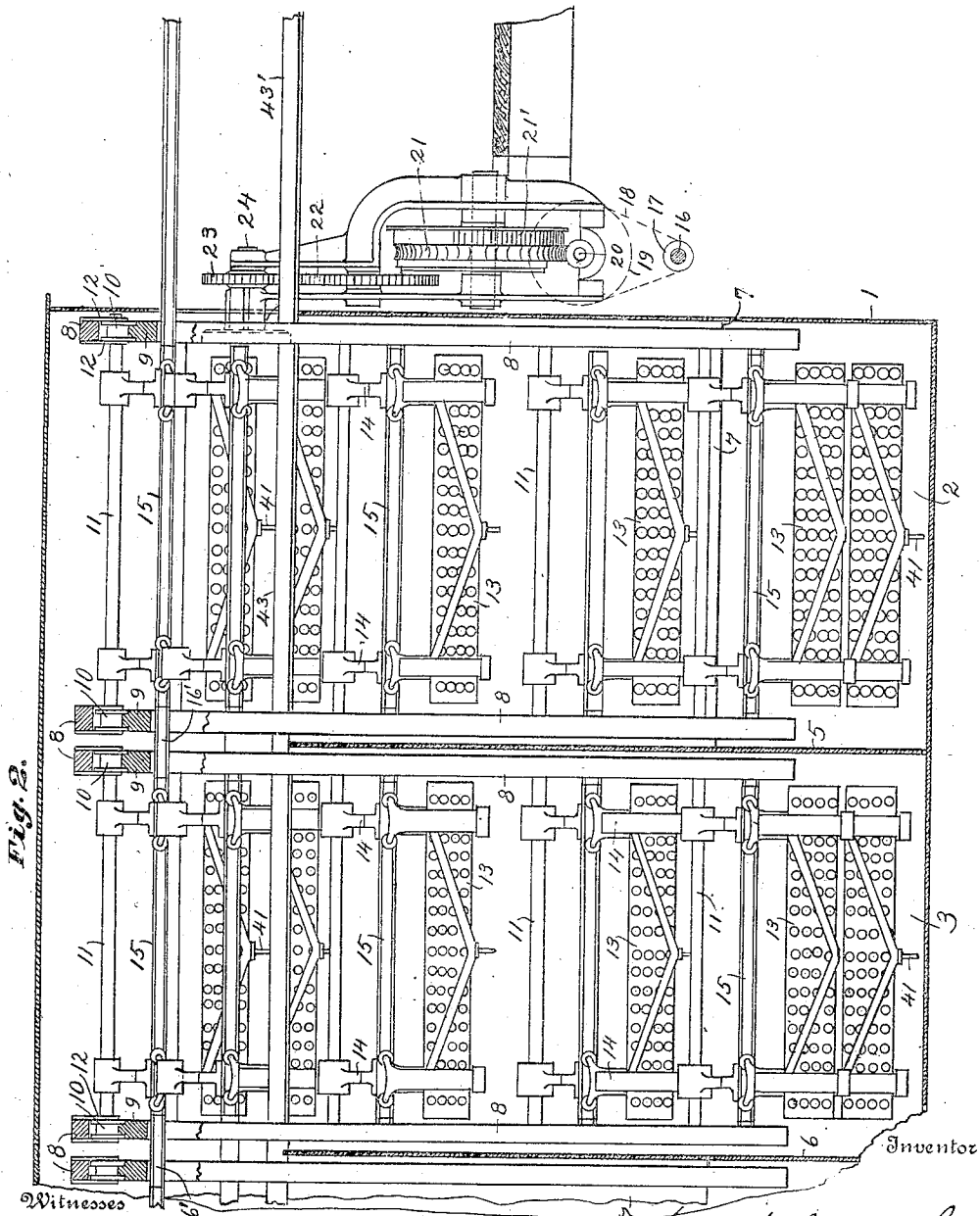


Fig. 2.

Witnesses
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384

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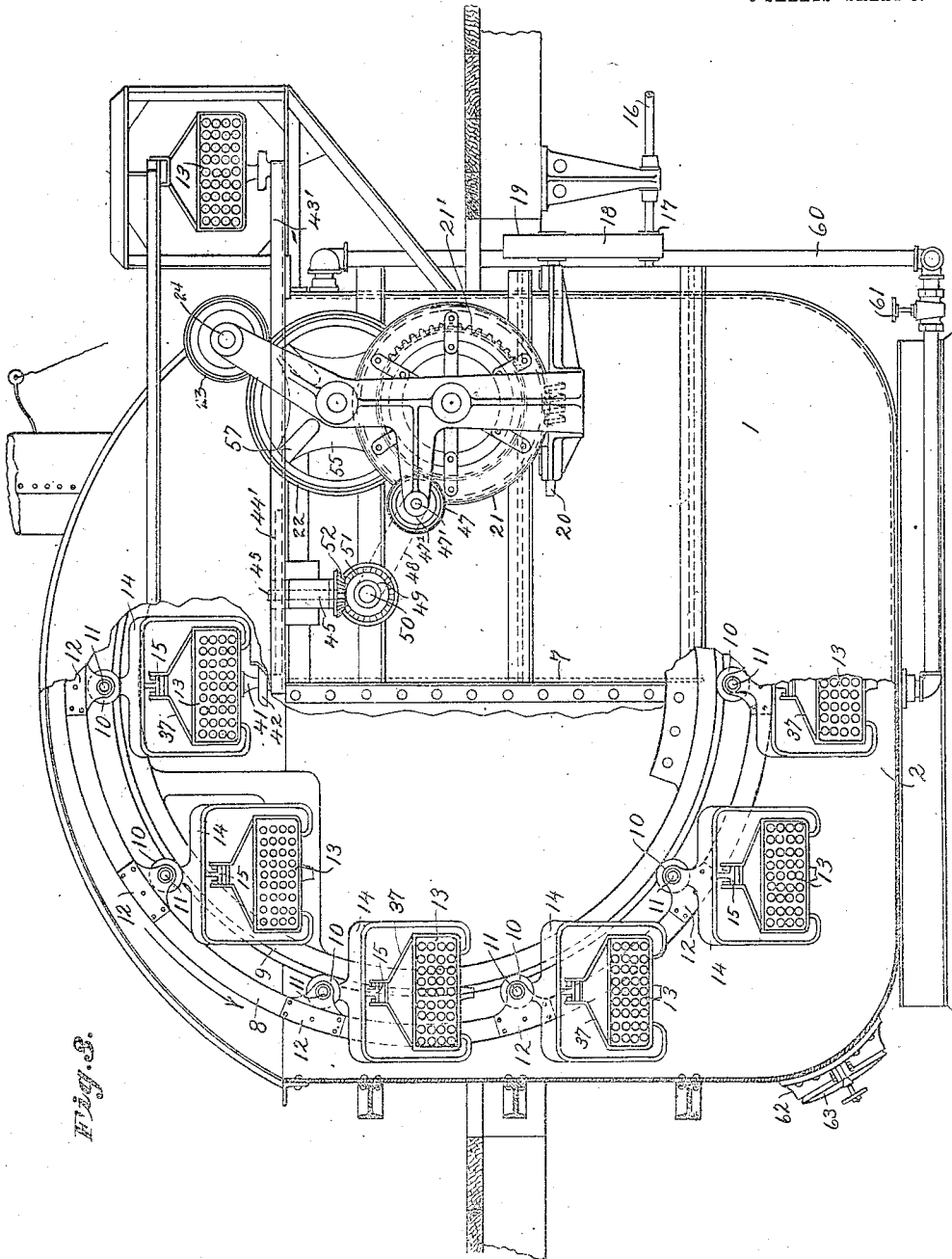
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WITNESSES:

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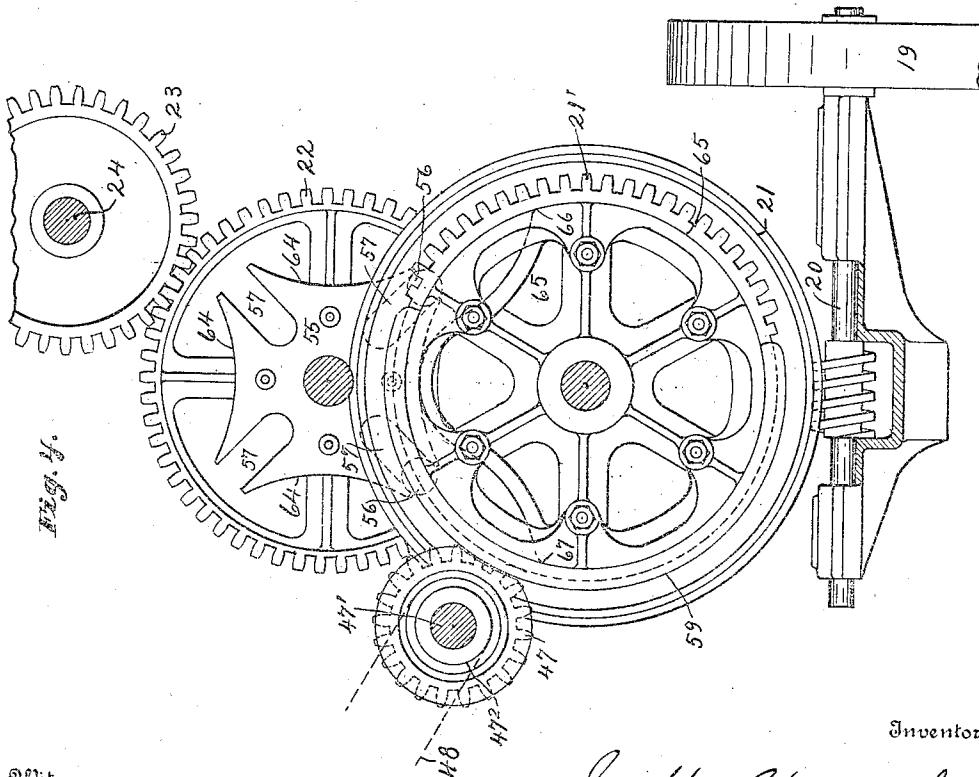
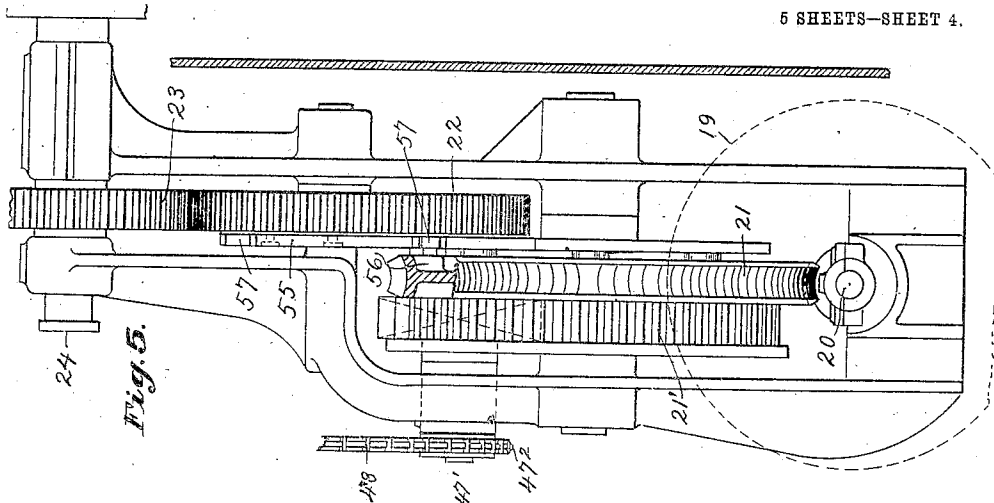
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5 SHEETS—SHEET 4.



Witnesses

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5 SHEETS—SHEET 5.

Fig. 8.

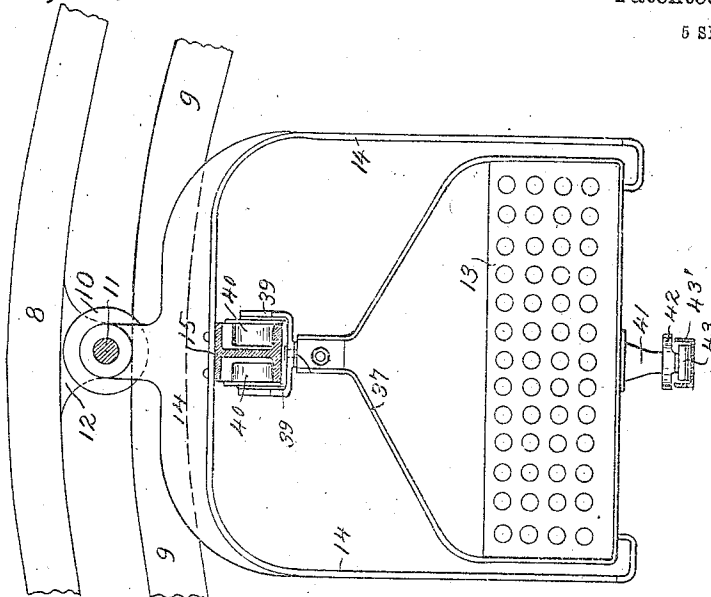
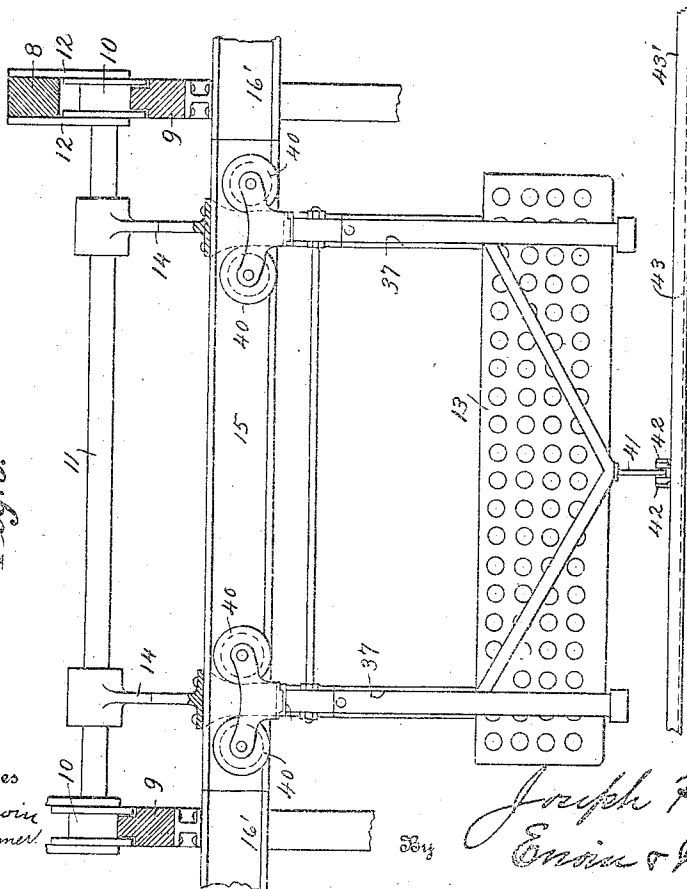


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH HAUKE, JR., OF MILWAUKEE, WISCONSIN, ASSIGNOR TO TWENTIETH CENTURY MACHINERY COMPANY, INCORPORATED, OF MILWAUKEE, WISCONSIN.

STERILIZING APPARATUS.

1,037,247.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed February 15, 1909, Serial No. 477,885. Renewed June 24, 1912. Serial No. 705,643.

To all whom it may concern:

Be it known that I, JOSEPH HAUKE, JR., a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Sterilizing Apparatus, of which the following is a specification.

My invention relates to improvements in apparatus for sterilizing milk, beer, and other liquid foods and beverages, and it pertains more especially, among other things, to the means employed for automatically conveying a large number of crated bottles in which the liquid is stored successively through a plurality of separate compartments, which are respectively supplied with water of successively higher and lower temperatures whereby the bottles and their contents will be gradually heated from a comparatively low to a high temperature and such contents sterilized, when the bottles are thereafter conveyed through the compartments in which the water is of successively lower temperature, whereby the liability of such bottles becoming broken by a too rapid change of temperature, is reduced to the minimum.

The construction of my invention is explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view thereof. Fig. 2 is a vertical section of the central portion of the apparatus. Fig. 3 is an end view, part broken away to show the interior. Fig. 4 is a detail, showing an enlarged end view of the driving mechanism. Fig. 5 is a side view of the driving mechanism shown in Fig. 4. Fig. 6 is a side view; and Fig. 7 is an end view of one of the crate supporting conveyers showing the track from which the conveyers are suspended and the device for moving such crates longitudinally of said tracks.

Like parts are identified by the same reference figures throughout the several views.

1 is a water tank, which is divided into a plurality of separate compartments 2, 3 and 4, by the transverse partitions 5 and 6 and the compartments 2 and 4 are respectively divided by the central vertical partition 7 beneath and above which the crates are carried in their annular course through the tank 1, as more fully hereinafter described. Each of the compartments 2, 3 and

4, are provided with two annular carrying collars 8, which collars are in turn revolvably supported from the stationary collars 9 through a plurality of intermediate anti-friction rollers 10, roller supporting shafts 11 and roller supporting brackets 12, while the several bottle crates 13 of the series are connected with and temporarily suspended from said shafts 11, through the hangers 14, whereby it will be understood that when said collars 8 are revolved, all the crates in the annular series will be successively immersed beneath the water in the tank 1 and carried from thence back to the starting point above the longitudinal center of the tank.

It will be understood that the crate carrying collars, together with the operating mechanism, are revolved with an intermittent movement which is so timed that the crate carrying hangers are stopped as each one is successively brought to each starting point above the longitudinal center of the inclosing tank when each hanger of the series is supplied with a crate until all the hangers in such annular series has been thus supplied. It will be obvious that when all the hangers in the first series have been thus supplied, the first hanger will have completed its circuit in the first compartment, when the crate in such hanger is moved forward from such compartment into the hanger of the next succeeding compartment and its place supplied with another, and this step in the process is repeated until all the crates in the first annular series have been moved forward from the first compartment into the next succeeding compartment, and the process is again and continuously repeated until all the crates have passed through all the compartments of the tank. It will be understood that all the crates in being thus conveyed through the tank, will each successively pass in an annular course through each successive compartment and that when each compartment has been thus filled with crates, they will be successively withdrawn from the last compartment of the series as they have completed their annular course in such series and their places will be successively supplied with fresh crates from the exterior. The first compartment 2 of the series being provided, as stated, with a vertical partition 7 and the

respective sides of the partition supplied with water of different temperatures, said partition has a tendency to keep the hot and cold water separate, whereby the crates, as they move in the direction indicated by the arrow in Fig. 3, are first conveyed downwardly through cold water and thence upwardly through warm water, whereby they are partially heated preparatory to entering the hot water, which is stored in the central compartment 3, the water in the central compartment being of the required temperature to properly sterilize the contents of the bottles. The compartment 4 is also divided centrally by a vertical partition, the same as compartment 2, and such third compartment is also in like manner supplied with water of two different temperatures, the warmer water being upon the left hand side of said vertical partition, reference being had to Fig. 3, and the cold water upon the right hand side, whereby said crates are first led into the warm water in the last compartment and from thence into the cooler water, and thereby gradually cooled before passing out of the sterilizing tank.

As a means of automatically conveying the crates through the several compartments of the tank, I have provided a supporting track formed of movable sections 15 and stationary sections 16', from which track the crates are suspended through the rollers 40, 40, roller supporting arms 39, 39, and bails 37, 37. The several crates are provided with a fin or bracket 41, which is adapted to be engaged by the moving lugs 42, 42, of the endless chain 43, when said chain is moved, whereby said crates are carried forward in a continuous course through the several compartments of the tank, and from thence back to the starting point. The endless chain 43, which also passes through the tank and back to the starting point beneath the track, is supported in a channel 43' and at the respective ends of the tank 1 by the several wheels 44, wheel 44' and wheel supporting shafts 45. When the bottles have completed their course through the several compartments, they are manually removed from the crates and replaced with others at any intermediate point between the ends of the tank as found most convenient, whereby all the crates carried by the chain are continuously supplied with bottles. As the crates are thus successively conveyed into and out of the tank and from one compartment to the other, it becomes necessary to stop the annular movement of the carrying hangers that the crates may pass to and from them and it is also necessary to alternately start and stop the longitudinal movement of the endless chain 43 that the crates carried thereby may be emptied and refilled with bottles and the intermittent movement of such parts

must be so timed as to alternate with each other.

An intermittent movement is communicated from the segmental gear 21' to the endless chain 43, through the pinion 47, shaft 47', sprocket wheel 47', sprocket chain 48, sprocket wheel 49, shaft 50, miter gears 51 and 52, shaft 45, and from thence to the wheel 44' from which wheel motion is communicated direct to the endless chain 43. The wheel 44' serves as the driver of the chain, while the other wheels 44 serve simply to support said chain as it is being driven. The intermittent movement of the chain and the parts connected therewith is effected by the action of the segmental gear 21' upon the pinion 47. As the segmental gear 21' revolves, it communicates movement to said pinion 47 during a part of its revolution only, while the teeth of said segmental gear are in contact with such pinion. When, however, the blank space 59 passes such pinion, the pinion is permitted to stop and the endless chain is thus caused to stop and start with each revolution of the segmental gear 21' on its supporting shaft. As an intermittent movement is thus being communicated from the driving shaft to the endless chain, an intermittent movement is simultaneously communicated from the motor driven shaft 16 to the crate carrying mechanism through the pulley 17, belt 18, pulley 19, worm shaft 20, worm gear 21, laterally projecting pins 56, Geneva gear 64, gear 22, pinion 23, shaft 24, and from said shaft 24 to the several crate carrying collars 8, through the several pinions 25, 26, 29, 30, 33 and 34, which pinions respectively mesh in the annular series of gear teeth 27, 28, 31, 32, 35 and 36 formed upon the vertical edge of said carrying collars, the laterally projecting pins 56 operating in the slots 57 of the so-called Geneva gear 55 in such a manner that the annular movement of the crate carrying hangers is stopped and remains at rest while the crates are being conveyed into them, and when the crates have been thus moved by the endless chain, the movement of the chain is stopped, while the crate supporting hangers move far enough to bring the next succeeding hanger into position for the reception of the next succeeding crate, when such collar is stopped and the endless carrying chain again started, and the operation described is again and continuously repeated until all the crates have passed through the apparatus. The intermittent movement is thus communicated to the Geneva gear through the action of the laterally projecting pins 56 as they pass into and out of the recesses 57 and when said pins 56 are brought out of contact with said Geneva gear, the same will remain at rest until the gear carrying said pins 56 has completed its revolution.

60 is a duct through which hot water may be led from a boiler to the central compartment of the tank 1 and 61 is a valve for controlling its admission.

5 62 is a manhole, which is closed by the cover 63. The stationary track sections are supported at their respective ends from the stationary collars 9, while the movable track sections 15 are revolvably suspended at their
10 respective ends from the movable collars 8, through the hangers 12 and shafts 11, whereby, when the crates are moved forward from one movable track section 15 to another, they pass over the intermediate stationary sections 16'. The position of the stationary
15 track 16' is such that the several sections 15 are successively brought into alinement with them as they reach the vertical above the longitudinal center of the tank. The Geneva gear 55 is provided with a plurality of
20 concave bearing surfaces 64, which as the pins 56 are brought out of contact with the slots 57, are adapted to bear against the convex surface of the flange 65 carried by the
25 gear 21, whereby said Geneva gear is prevented from turning, while all that part of the convex surface 65 between the points 66 and 67 are passing beneath such concave surface 64, and whereby such gear is re-
30 tained in such position that the driving pins 56 will freely enter said slots 57, when said gear 22 has completed its annular movement.

While the mechanism for conveying the crates of bottled goods into and from the
35 sterilizing tank and for carrying said crates in a circular course through each compartment of said tank, each comprise several co-operating parts, for brevity of description, such conveyers are respectively hereinafter
40 referred to in the claims as horizontal and revoluble conveyers. It will be understood that the conveyor track comprising said stationary and movable sections, extends longitudinally through the several compart-
45 ments of said tank and from thence around its exterior, whereby the crate carrying hangers and crates are thereby conveyed in a continuous course through and then around one side of said tank. The endless
50 conveyor chain heretofore referred to is suspended centrally beneath said track throughout its entire length in such a manner that the brackets 42 connected with said chain, are adapted to engage the depending fin 41
55 connected with said crates, whereby when said chain is moved, the required movement will be communicated from said chain to said crates and said crates moved forward through the several compartments of the
60 tank as previously described.

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

1. In an apparatus of the described class,
65 the combination of a sterilizing tank, a pair

of annular stationary crate supporting collars mounted in said tank, a pair of annular revoluble collars each provided with a plurality of roller bearings surrounding and supported from said stationary collars, a
70 plurality of sets of crate carrying hangers pivotally suspended from said revoluble collars, means for conveying bottle crates from the exterior of said tank into position to be carried by said hangers, means for com-
75 municating an intermittent movement to said revoluble collars, and means for moving the crates from the hangers of said tank after they have completed their annular course therein.

2. In an apparatus of the described class, the combination of a sterilizing tank divided by transverse partitions into a plurality of compartments, a pair of annular stationary
85 crate supporting collars mounted in each of said compartments, a pair of annular revoluble collars provided with a plurality of roller bearings surrounding and supported from said stationary collars, a plurality of
90 sets of crate carrying hangers pivotally suspended from said revoluble collars, means for conveying bottle crates from the exterior of said tank into position to be carried by said hangers, means for communicating an
95 intermittent movement to said revoluble collars, means for moving the crates from the hangers in one compartment after they have completed their annular course therein to the hangers of the next compartment, and means for moving the crates from the last
100 compartment.

3. In an apparatus of the described class, the combination of a sterilizing tank divided by transverse partitions into a plurality of
105 compartments, a pair of annular stationary crate supporting collars mounted in each of said compartments, a pair of annular revoluble collars provided with a plurality of roller bearings surrounding and supported from said stationary collars, a plurality of
110 sets of crate carrying hangers pivotally suspending from said revoluble collars, a movable track section for each set of crate carrying hangers located within and carried by said annular revoluble collars, a stationary
115 track section supported above the longitudinal center of the tank in alinement with said movable track sections between and upon each side of the several compartments, means for communicating an intermittent
120 movement to said revoluble collar and track sections carried thereby, and means for moving said crate carrying hangers from said stationary to said movable track sections, when the latter are at rest.

4. In an apparatus of the described class, the combination of a sterilizing tank divided by transverse partitions into a plurality of
125 compartments, a pair of annular stationary crate supporting collars mounted in each of

said compartments, a pair of annular revoluble collars provided with a plurality of roller bearings surrounding and supported from said stationary collars, a plurality of
 5 sets of crate carrying hangers pivotally suspended from said revoluble collars, a movable track section for each set of crate carrying hangers located within and carried by said annular revoluble collars, a station-
 10 ary track section supported above the longitudinal center of the tank in alinement with said movable track sections between and upon each side of the several compartments, means for communicating an intermittent
 15 movement to said revoluble collar and track sections carried thereby, a bottle crate carried by each of said hangers, an endless conveyer chain extending longitudinally from one end to the other through the several
 20 compartments and from thence to the starting point, returning upon the exterior of said compartments, means for communicating an intermittent movement to said endless chain, and from said endless chain to
 25 said bottle crates.

5. In an apparatus of the described class, the combination of a sterilizing tank divided by transverse partitions into a plurality of compartments, a pair of annular
 30 stationary crate supporting collars mounted in each of said compartments, a pair of annular revoluble collars provided with a plurality of collar bearings surrounding and supported from said stationary collars, a
 35 plurality of sets of crate carrying hangers pivotally suspended from said revoluble collars, a movable track section for each set of crate carrying hangers located within and carried by said annular revoluble collars, a
 40 stationary track section supported above the longitudinal center of the tank in alinement with said movable track sections upon each side of the several compartments, means for communicating an intermittent movement to
 45 said revoluble collar and track sections carried thereby, a bottle crate carried by each of said hangers, an endless chain extending longitudinally from one end to the other through the several compartments and from
 50 thence to the starting point, returning upon the exterior of said compartments, means for communicating an intermittent movement to said endless chain, and means for alternately connecting said chain to and releasing it from said crates as the latter are
 55 moved with said hangers from one of said

track sections to the other through said compartments.

6. In a pasteurizing apparatus, the combination of a tank divided by transverse partitions into a plurality of compartments, annular stationary collars mounted in each
 60 of said compartments, annular revoluble collars supported from and around said stationary collars, crate carrying hangers pivotally suspended from said revoluble collars, bottle crates carried by said hangers, a
 65 fin connected with each of said crates, an endless conveyer chain extending longitudinally from one end to the other through the compartments of said tank, a plurality of lugs connected with said chain, said lugs being adapted, as said chain is revolved, to engage said fins and move said crates and to be automatically disengaged from said
 70 fins as said crates are moved laterally by said annular revoluble collars, and means for alternately moving and stopping said endless chain and revoluble collars.

7. In a pasteurizing apparatus, the combination of a tank divided by transverse partitions into a plurality of compartments, annular stationary collars mounted in each
 80 of said compartments, annular revoluble collars supported from and around said stationary collars, crate carrying hangers pivotally suspended from said revoluble collars, bottle crates carried by said hangers, a
 85 fin connected with each of said crates, an endless conveyer chain extending longitudinally from one end to the other through the compartments of said tank, a supporting channel for said carrier chain, a plurality of sets of lugs connected at short intervals
 90 apart to said carrying chain, each set comprising two outwardly diverging members between which is a space for the reception of the fin carried by each of said crates, whereby when said chain is at rest, the
 95 fins of said crates are caused by the movement of said revoluble collar, to enter such space and be engaged by said lugs, and when said collar is at rest, said crates will be disengaged from said lugs by the forward movement of said chain, all substantially
 100 as and for the purpose specified.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH HAUCK, Jr.

Witnesses:

O. R. ERWIN,
 JAS. B. ERWIN.