

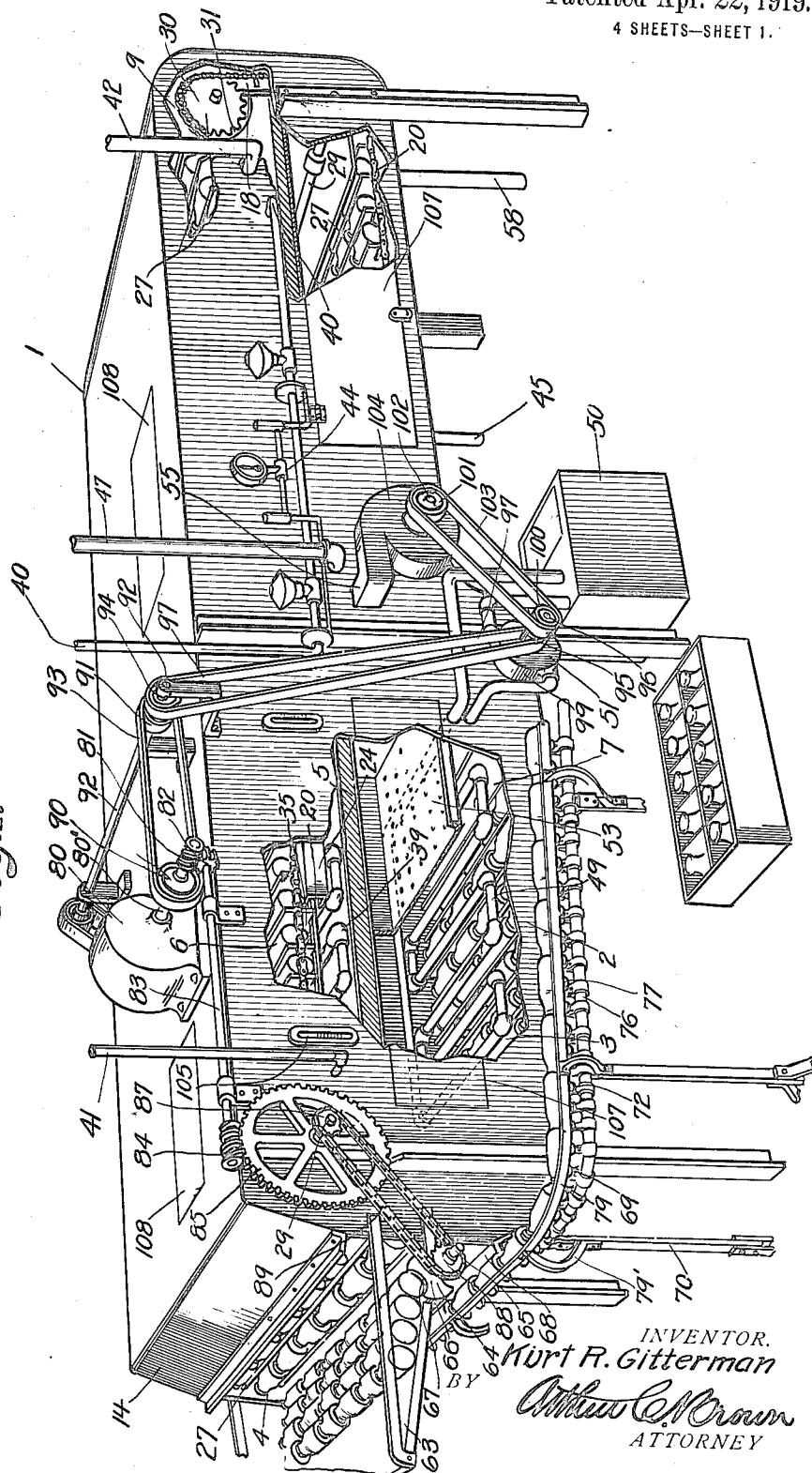
1,301,428.

K. R. GITTERMAN.  
PASTEURIZER.  
APPLICATION FILED DEC. 23, 1916.

Patented Apr. 22, 1919.

4 SHEETS—SHEET 1.

Fig. 1.



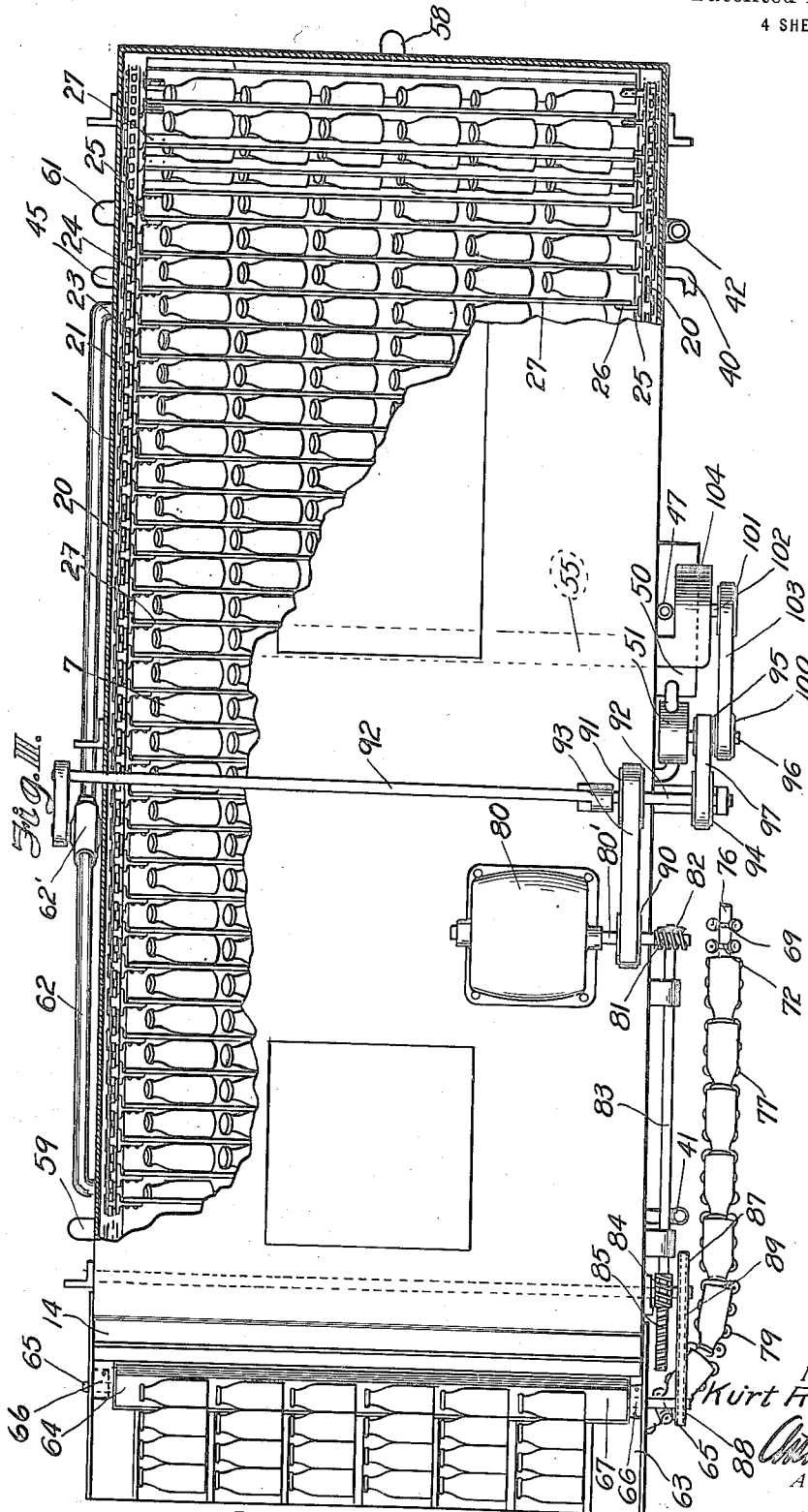
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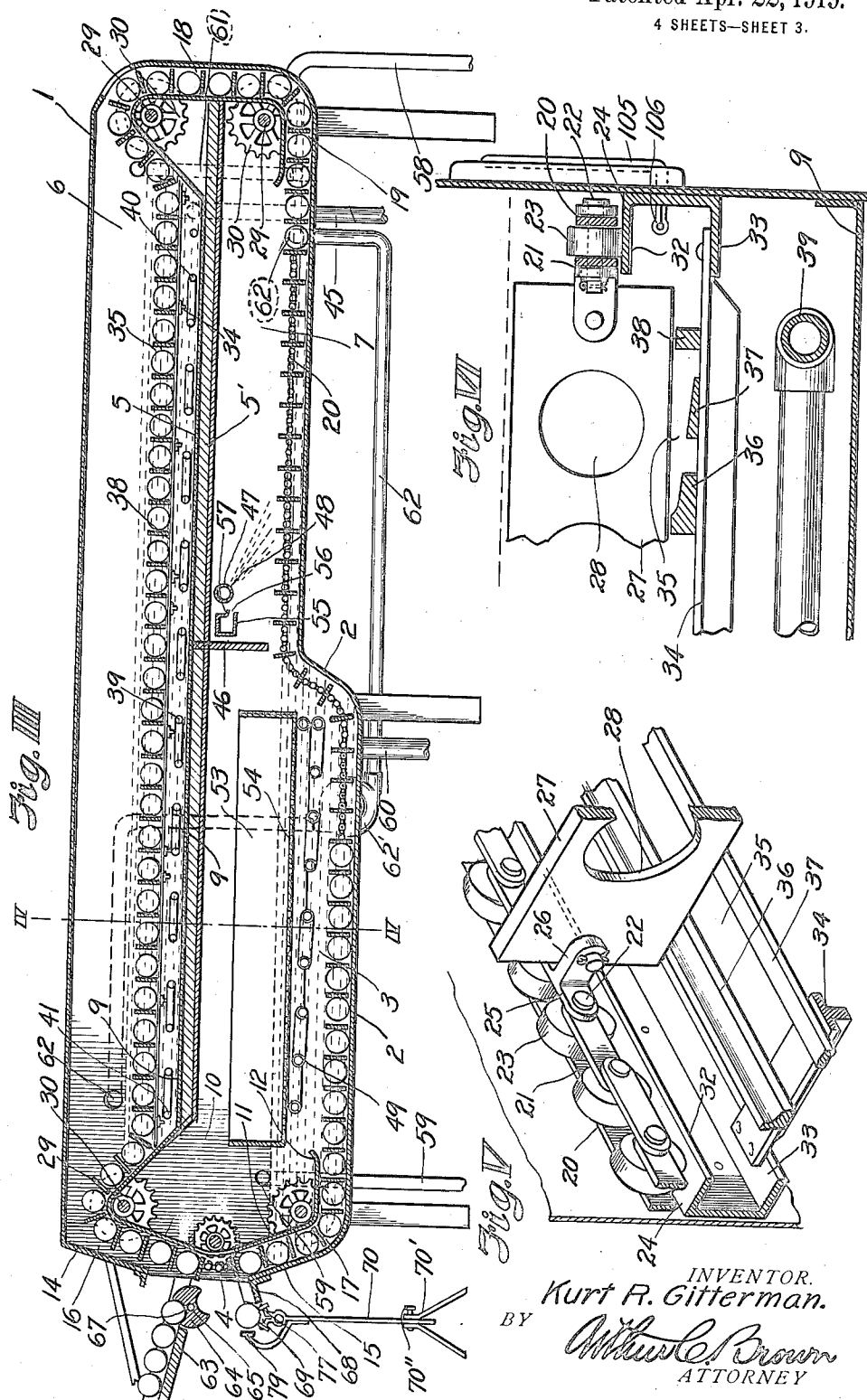


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4 SHEETS—SHEET 3.



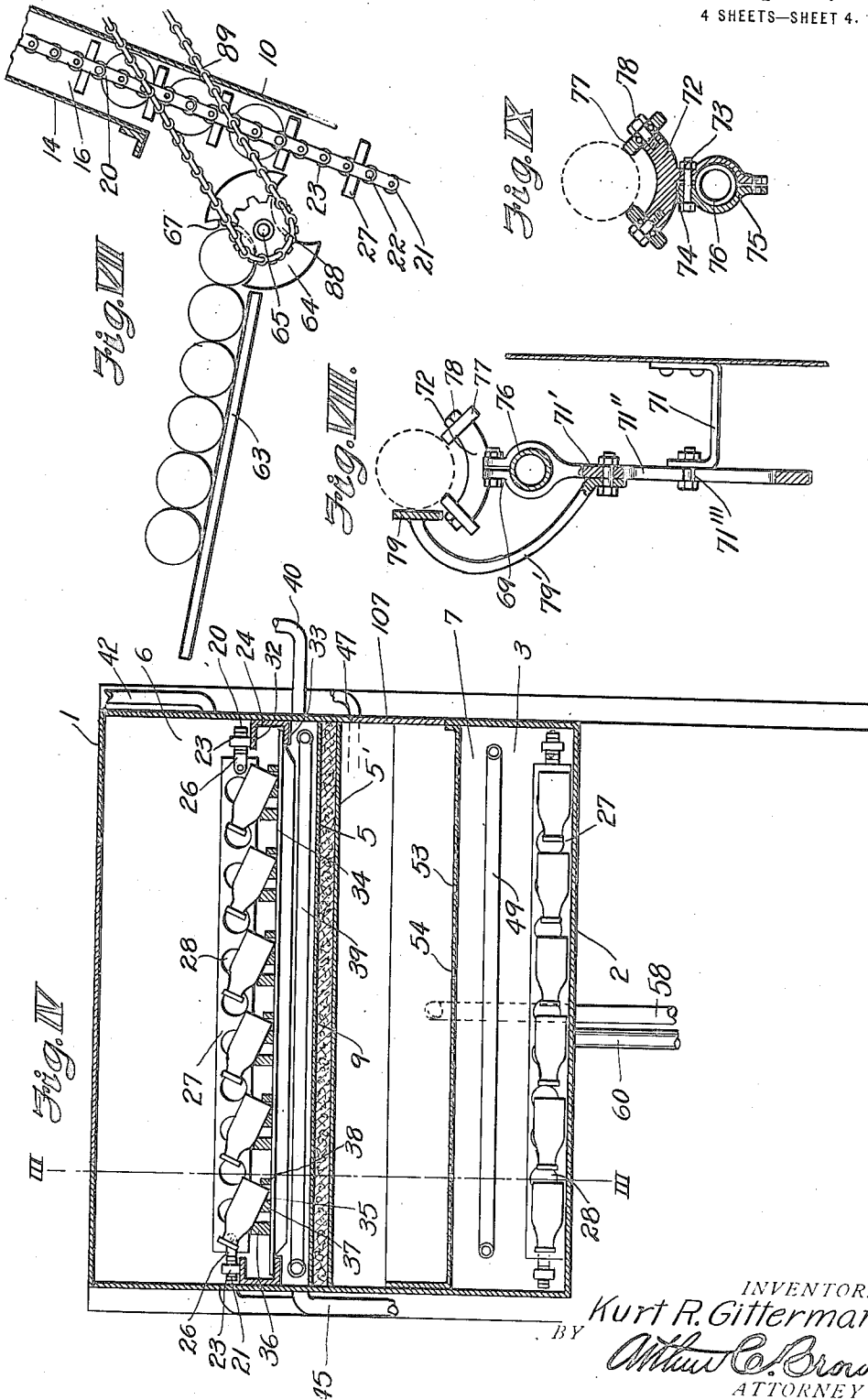
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

KURT R. GITTERMAN, OF BROOKLYN, NEW YORK.

## PASTEURIZER.

1,301,428.

Specification of Letters Patent.

Patented Apr. 22, 1919.

Application filed December 23, 1916. Serial No. 138,550.

*To all whom it may concern:*

Be it known that I, KURT R. GITTERMAN, a citizen of the United States, residing at Brooklyn, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Pasteurizers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to pasteurizers, and more particularly to apparatus for pasteurizing bottled liquids; the principal object of the invention being to provide apparatus whereby sealed bottles containing the liquid to be pasteurized may be fed automatically and successively through pasteurizing and cooling chambers, wherein the temperatures are graduated to obviate sudden changes that might injuriously affect the liquid or containers.

In accomplishing this and other objects of the invention I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:—

Figure I is a perspective view of a pasteurizer containing my improvements; parts of the housing being broken away to show the interior thereof.

Fig. II is a plan view with a part of the housing broken away to show the interior thereof.

Fig. III is a longitudinal, vertical section of the pasteurizer on the line III—III, Fig. IV, showing the bottles lying horizontally in the conveyers.

Fig. IV is a transverse vertical section on the line IV—IV, Fig. III, showing the bottles in inclined position in the upper conveyer.

Fig. V is an enlarged detail perspective view of part of the conveyer and upper platform.

Fig. VI is an enlarged section of part of the upper conveyer and platform, showing the relation thereof to the heating coils.

Fig. VII is an enlarged side elevation of the automatic bottle feeder and part of the conveyer.

Fig. VIII is a detail perspective view of a part of the offtaking conveyer support.

Fig. IX is a similar view of the offtaking conveyer track.

Referring more in detail to the drawings:—

1 designates a housing, preferably rectangular in both horizontal and vertical cross-section; but provided forwardly at about its longitudinal center with a downset portion 2 for forming a refrigerating tank 3 as presently described. The forward end of the tank is provided at about its center with a transverse opening 4, and the interior of the tank is divided horizontally by a double partition comprising the spaced members 5—5' which separate the said interior into an upper preheating and pasteurizing chamber 6 and lower pre-cooling, cooling and refrigerating chamber 7; the double partition being provided to effect separation of temperatures as well as contents of the chambers, the ends of the partition being inset from the ends of the housing to provide for continuous travel of a conveyer continuously about the partition and through the upper and lower chambers.

The partition 5 coöperate with the sides of the housing to form a tank 9, and its forward end is inclined and extended above the desired water level and turned downwardly to form the forwardly and downwardly inclined conveyer support 10; the said support being turned rearwardly below the partition 5—5' and slightly below the center of the feed opening 4 of the housing to form the lower conveyer guide 11; the lower end of said guide 11 being extended horizontally to continue the guide, and flared upwardly at 12 to form a rearwardly opening mouth within the refrigerating tank. The upper and lower portions 14—15 of the front of the housing are inclined to lie substantially parallel with the conveyer support and guides 10—11, thereby forming channels 16—17 through which the conveyers may travel and advance the bottles; the inclined tank extension 10 and the inclined lower portion of the housing 15, serving as supporting guides to retain the bottles on the conveyer division plates. At its rear end the partition member 5 is spaced from the rear end of the housing and extended upwardly above the desired water level and turned downwardly over the end of the member 5' and in spaced relation to the end of the housing to form the vertical channel 18 and forwardly to form the lower horizontal channel 19,

through which the conveyer may travel to conduct bottles from the upper tank to the lower portion of the housing.

The conveyer heretofore mentioned comprises endless belts 20 arranged at opposite sides of the housing, and each comprises links 21 pivotally connected by pins 22 and spaced by rollers 23 that are rotatably mounted on said pins and adapted for travel on the tracks 24 on the sides of the housing; the belts including paired links 25 having inwardly directed ears 26 carrying the division plates 27 that extend transversely across the housing and serve to space the conveyer belts and advance the bottles, as will presently be more fully described. The plates 27 are spaced sufficiently to form pockets within which the bottles containing liquid to be pasteurized may be contained without waste of space, but are adapted for allowing freedom of movement of the bottles in order that the latter may turn while advanced by the division plates during the pasteurizing process, and each of the plates is provided with apertures 28 through which water contained in the pasteurizing and refrigerating tanks may pass as the conveyer advances, in order to avoid retarding of the conveyer and excessive agitation of the heating and cooling liquids in the tanks and also to permit the circulation of water herein-after described.

Located at each corner of the housing is a transverse shaft 29, and fixed on said shafts are sprocket wheels 30 which lie adjacent the sides of the housing and have peripheries extended beyond the extensions 10—11 of the tank 9 in order to engage the conveyer belts 20 to effect the advance thereof; the teeth of the sprocket wheels projecting between the belt links 21 and between the rollers 23 to form the operative connection between the wheels and belt.

The preferred construction of the tank and combination thereof with the sprocket wheels is as stated that wherein the bottom and ends of the tank 9 are formed from the sheet of metal that extends entirely across the housing and connects therewith, so that the sides of the housing also form the sides of the tank; the metal sheet being turned up at its ends to form the ends of the tank, and said ends being provided with slots 31 to receive the sprocket wheels so that the latter will be in proper alinement with the conveyer chains; this construction being followed out at the lower ends of the extensions 11—12 as well as at the upper ends thereof.

With this preferred construction, the tracks 24 comprise channel irons having inwardly directed upper and lower flanges 32—33; the former of which constitute the tracks along which the conveyer rollers travel, while the lower flanges form supports for transverse bars 34 that carry the longi-

tudinal platform upon which the bottles are supported and advanced while the process is in operation. This construction also provides for removal of the platform to provide access to the bottom of the tank and the heating coils.

The structure herein shown is particularly adapted for the pasteurization of milk, a liquid containing organic matter which upon being heated to pasteurizing temperature throws off volatile gases that must be liberated from the bottles within which the milk is contained. This liberation is effected about the non-internal pressure resisting caps with which the bottles are crowned, and to obviate loss of the contents with escaping gases I arrange the runways or supports on which the bottles are conducted through the pasteurizer at such an incline that the air spaces in the bottles are at the top of the neck.

With the bottles arranged at an incline and constantly rotated (as presently described), the tendency to over pasteurize the milk at the top of the bottle is obviated as heat rising through the contents of the bottle crosses the column of liquid as distinguished from passing up the column and the contents are constantly stirred, effecting a thorough and uniform heating and pasteurization.

It is apparent, however, that the scope of the invention should not be limited to such details as changes may be made to adapt the apparatus for the pasteurization of other liquids.

The bottle platform just mentioned preferably comprises a plurality of individual runways 35, each consisting of three or more spaced strips 36, 37, and 38, of graduated height; the side strips 36 and center strip 35 being beveled on the same incline to support a bottle in inclined position, and the other side strip 38 serving as a stop for the bottom of a bottle that is supported on the other two, so that when a bottle is located on a runway, its sides will engage the strips 35 and 36 and its bottom will engage the strip 38 to maintain the inclined position of the bottle and permit free rotary movement thereof under the propelling contact of the conveyer division plate and provide for free circulation of the heating liquid thereabout. There may be any suitable number of individual runways on the platform according to the capacity which it is desired to give to the apparatus.

Located within the heating tank 9 below the bottle runways is a coil 39 having an intake end 40 leading to a source of steam supply (not shown), and an exhaust end 41 leading from the opposite end of the coil through the side of the housing.

Leading through the housing wall is a water supply pipe 42 whereby the tank 9 may be filled to a level above that of the

tops of the bottles on the platform, so that when the apparatus is in operation the water is heated to a temperature sufficient for proper pasteurization and retained at the proper temperature by the steam coil; the temperature being maintained within a determined range by a suitable thermostatic device indicated at 44, and which has suitable connection with the steam supply to regulate the intake according to the requirements of the coil.

A pipe 45 also leads from the bottom of the tank 9 in order that the latter may be drained when the apparatus is to be cleansed or its use discontinued.

While it is desirable to raise the temperature of the liquid to be pasteurized to the pasteurizing chamber as rapidly as possible, and to maintain that temperature for a period, it is not desirable to effect a sudden cooling of the pasteurized liquid because of the possibility of breakage of the containers.

In order to effect this gradual cooling I divide the cooling chamber 7 preferably at about the inner end of the brine tank 3 by a transverse partition 46 which is spaced from the bottom of the chamber 7 to permit flow of liquid through the chamber in one direction and travel of the conveyer there-through in the opposite direction.

Extending through one side of the housing, transversely across the chamber 7 at the oncoming side of the partition 46 is a water pipe 47 having apertures 48 directed downwardly and rearwardly to throw jets of water toward the oncoming bottles as the latter pass through the primary end of the cooling tank after pasteurization; the pipe 47 being connected preferably with a city water main, so that the water is delivered into the cooling tank at a cooling temperature. This temperature, however, is not as low as it is desirable to properly condition the pasteurized liquid, and I have, therefore, provided the refrigerating tank 3 and provided means for cooling liquid in the tank to form a bath for the bottles after they have left the pasteurizing chamber. This means comprises a coil 49, the convolutions of which extend transversely within the refrigerating tank, and the ends of which communicate with a brine tank 50. A pump 51 is interposed in the intake end of the coil so that brine may be circulated from the tank 50 through the coil and back through the tank to provide a constant flow of brine through the coils that will produce the cooling effect on the liquid within the tank 3, and as the primary end of the chamber is in open communication with the tank portion 3 this cooling effect of the coil is imparted to all of the liquid in the cooling chamber.

To supplement the cooling effect of the brine I locate an open pan 53 within the re-

frigerating tank 3 for carrying cracked ice for further cooling the liquid; the bottom of the tank being below the normal level of the cooling liquid and provided with apertures 54 through which liquid may circulate to produce the cooling effect. The pan 53 is preferably loose in the chamber 3 in order that it may be moved about to provide access to the refrigerating coils.

It is, as before stated, undesirable to effect a too sudden cooling of the bottles as they come from the pasteurizing chamber, and in order to graduate the cooling effect I provide the primary cooling jets just described, and thus induce a flow of the cooled liquid toward the primary end of the cooling chamber, the flow being assisted by an air blast delivered through an elongated nozzle 55 that extends transversely across the cooling chamber between the partition 46 and jet pipe 47; the nozzle opening 56 being located at the lower rear corner of the nozzle and provided with lips 57 that restrict the opening and direct the blast of air downwardly and rearwardly across the water jets to lower the temperature of the cooling liquid in the chamber toward the rear end of the tank.

This air blast is intended to effect the refrigeration that naturally goes with evaporation, and as the bottles at this point of the machine are only two-thirds covered with water thus exposing the upper sides of the bottles, the exposed part of the bottle being subjected to evaporation assuring a more rapid and economical cooling of the contents.

As the temperature of the pasteurizing chamber is preferably constant at about 148 degrees F., and the bottles of milk, or other liquid, are retained in the said chamber, approximately thirty minutes in order to effect proper pasteurization, the bottles are thoroughly heated as they enter the cooling chamber and consequently raise the temperature of the cooling liquid as they advance in the direction of the refrigerating tank; so that it is economical to flow the cooling liquid through the cooling chamber from the refrigerating tank toward the rear end of the housing and draw off part of the warmed liquid from the rear end of the cooling chamber so as to keep it sweet and fresh. This circulation carries the water which has been warmed by the bottles to the forwardmost part of the upper tank where the cold bottles enter for preheating. In this way I maintain a medium temperature for pre-cooling at the rearmost point of the cooling chamber and also a medium temperature at the forwardmost point of the upper or pasteurizing tank for gradual preheating purposes and at the same time will economize on steam. This drawing off is effected through an overflow pipe 58, and in order that there

may be a continuous supply of liquid and flow thereof in the proper direction I provide an inlet 59 at the front end of the refrigerating tank. The intake pipe may be connected with a water main, or other source of supply and the overflow pipe with a drain, although such connections are not essential as water may be circulated through the cooling system and re-used if desired. This circulation may be effected through a pipe 62 which connects the entrant ends of the cooling and pasteurizing chambers and has a pump 62' interposed therein to draw water from the cooling chamber and deliver it to the pasteurizing chamber.

In order to drain the cooling chamber when the use of the pasteurizer is discontinued, I provide a drain pipe 60 opening from the bottom of the refrigerating tank through which all of the water in the cooling chamber may be drawn off when desired. As it is desirable to maintain a constant level in the pasteurizing or heating tank, I provide an overflow pipe 61 for delivering water from the upper into the lower chamber and which may be located at any desired point throughout the length of the tank, but is preferably arranged at the rear end thereof.

Located in front of the feed opening 4 at the front of the housing is an inclined table 63, upon which the bottles of liquid to be pasteurized may be placed to be fed into the pasteurizer, and located between the lower end of the table and the feed opening is a selective feeding device 64, comprising a cylindrical block or metal cylinder fixed on a shaft 65 that is rotatably mounted in bearing members 66 that extend forwardly from the sides of the housing; the block or metal cylinder extending transversely across the entire front of the housing and having opposite concaved seats 67 extending throughout its length, and of a depth to receive a single bottle from the table 63. The block is of sufficient diameter to substantially fill the space between the end of the table and the mouth of the housing, so that when the block is rotated the pockets 67 are successively presented to position for receiving a bottle from the table and carrying the same across the intervening space and delivering the same onto a division plate on the conveyer, as the latter moves across the feed opening.

While I have referred to the block as taking single bottles from the table it is apparent that when the bottles are arranged end to end on the table a full row is fed to the feeding block, the number of bottles being fed at each half-revolution of the block being determined by the number of bottles in a row on the table.

Not only is the apparatus fed automatically as described, but the bottles after pasteurization and refrigeration are automatically delivered from the apparatus. This

delivery is effected by an elevation of the bottles from the bottom of the refrigerating tank on the division plates 27 and over an inclined shelf 68 at the lower end of the feed opening. Located at the forward end of the shelf in position for receiving the bottles therefrom is a conveyer 69 which may be supported from the floor on standards 70 (Fig. III), or may be mounted on brackets 71 on the housing (Fig. VIII). In either event the conveyer should be vertically adjustable, so that the pitch of the conveyer and speed of the bottles can be controlled. The rollers of the conveyer are constructed to accommodate all sizes of bottles without adjustment in each case. One form of adjustment for the conveyer may comprise a base 70' within which the standards 70 are slidably mounted and held in adjustable position by set screws 70'', and another form may comprise a vertical bar 71' that supports the conveyer and has a slot 71'' through which a bolt 71''' may be extended to adjustably connect the head with the brackets 71. The preferred form of off-taking conveyer comprises members 72 having ears 73 attached to mating ears 74 on collars 75 that are attached to a spine 76, which is carried on the standards 70, or brackets 71; the spine being preferably jointed to provide flexibility, so that it may be extended at any angle from the housing to deliver the bottles to a delivery position.

The members 72 are further provided at their edges with ball bearing rollers 77 rotatably mounted on an axis 78 on the members 72, so that the bottles are received on the rollers and held out of contact with the carrying members 72; the said members being inclined from the receiving to the delivery point in order that the bottles may travel by gravity to the delivery position. The members 72 are adapted for receiving bottles over their edges from the mouth of the housing, and in order to prevent the bottles from passing entirely across said members I provide stop rails 79 which are arranged along the outer side of the members 72 and serve to retain the bottles therein; said stop members consisting of a rail carried by arms 79' from the standards 70, and which is flexible to provide for positioning of said members as heretofore described.

The shelf 68 and conveyer 69 are so pitched or inclined as to prevent the bottles unloading onto the conveyer all at one time. The mouth of the discharge is higher at the one end than at the other, so that as the division plate 27 rises slowly the nearest bottle will leave the machine first, the rest second and so on until all have been discharged to the roller conveyer.

The operative parts of the apparatus are preferably connected with a single motor 80, having a drive shaft 80', provided with a

worm 81, which meshes with a worm gear 82 on a driven shaft 83 which is also provided with a worm 84 that meshes with a worm gear 85 at the outer end of the upper forward cross shaft 29 adjacent the side of the housing, and whereby the conveyer is advanced to carry the bottles through and deliver the same from the pasteurizing and cooling chambers. The extended shaft 29 also carries a sprocket wheel 87, and run over said sprocket wheel, and over a sprocket wheel 88 on the feeder block shaft 65, is a chain belt 89 to rotate the feeder block and selectively feed the bottles in the pasteurizer.

The motor shaft also carries a pulley wheel 90, and run over said pulley wheel, and over a pulley wheel 91 on a counter shaft 92, is a belt 93, for driving the counter shaft. Also mounted on said counter shaft is a pulley wheel 94, and run over said pulley wheel and over a pulley wheel 95 on a pump shaft 96 carried by the housing, is a belt 97. The pump shaft extends into the pump housing to operate the pump that circulates brine from the tank 50 to the refrigerating tank within the cooling chamber of the apparatus. The pump shaft also carries a pulley wheel 100, and run from said wheel and over a pulley wheel 101 on a fan shaft 102 is a belt 103. The fan shaft operates a fan indicated by the housing 104 for delivering air under pressure through the nozzle 55 to furnish the air blast in the cooling chamber. The counter shaft 92 is preferably extended to operate the pump 62.

In order that the temperature of the pasteurizing chamber may be determined by an attendant, I provide thermometers 105 along the side of the housing (Fig. VI) having bulb tubes 106 extended within the heating chamber, and in order to afford access to the cooling chamber I provide the sides of the housing with doors 107 which may be opened when desired to observe the contents of the cooling chamber or provide access to the contents thereof. The top of the housing is also provided with doors 108 which may be opened when desired to provide access to the pasteurizing chamber.

In using the apparatus, assuming the parts to be constructed and assembled as described, the pasteurizing chamber is filled with water to a level which will insure complete immersion of the bottles to be passed therethrough, and steam turned into the coils 39 to heat the water to the desired temperature for preheating and pasteurization.

The cooling chamber is also fed with water to the desired level, which in this chamber provides for only partial immersion of the bottles; the supply in the pasteurizing chamber being maintained at the proper level by means of the overflow pipe 61, while

the level of the water in the cooling chamber is prevented from going above a certain point by the location of the overflow pipe 58. After water has been supplied to the cooling chamber, ice may be placed in the pan 53 and brine circulated through the coil 49 to lower the temperature of the liquid in the cooling chamber to the desired degree.

While the pasteurizing chamber is being heated and the cooling chamber cooled, bottles of liquid to be pasteurized are placed in rows on the feeding table 63, and when the apparatus is ready for use the motor is started in operation to actuate the conveyer and feeder, and also to actuate the brine pump and fan nozzle, and water is turned into the jet pipe 47 to supply the cooling jets.

When the parts are in operation as described, rotation of the feeding block will present the pockets 67 thereof to position for receiving bottles from a feeding table and carry the bottles around and deliver them onto the traveling division plate 27 of the conveyer. When the bottles are delivered onto the division plates they are carried up over the end of the pasteurizing chamber and lowered into the heated water in said tank; being supported on the division plates and tank end member until they reach the horizontal path of the conveyer, when they are supported entirely on the inclined runways 35. Forward movement of the conveyer along its horizontal path in the pasteurizing chamber serves then only to advance the bottles by pushing thereagainst, this pushing serving to roll the bottles along the runways and constantly change the position of the bottles, so that the contents therein may be uniformly treated by the heat rising from the steam coil upward through the water and then to the center column of the contents in the bottle; the speed at which the conveyer travels being regulated to retain the bottles for a definite period within the pasteurizing chamber and insure complete pasteurization of the contents.

After the bottles have passed to the outside end of the pasteurizing chamber they are brought by the division plates out of the inclined rear end of the cooling chamber and carried up said member and over the end thereof into the vertical channel 18, where they are carried downwardly on the division plates into the pre-cooling chamber. When the bottles enter the pre-cooling chamber they are partly immersed in the water that is blown by the air blast, thereby coming first in contact with the warmest volume of cooling water so as to obviate a sudden change of temperature that might break the containers or injure the contents thereof. The air blast also aids in cooling

the containers by the process of refrigeration that results from the evaporation caused by the said air blasts blowing on the parts of the bottle that are not covered with water, but which is kept wet by the constant rolling movement of the bottle. Continued movement of the conveyer, however, carries the bottles forwardly through the cooling liquid, the water jets and air blasts, so that by the time they reach the refrigerating tank they are at sufficiently low temperature to enter the tank without injury, and pass through the bottom of the tank beneath the brine coils and forwardly therethrough to the outlet; being cooled to substantially any desired temperature at the time they leave the tank.

As they reach the forward end of the tank they are carried up the incline on the division plates and when they reach the opening move down the inclined shelf onto the offtaking conveyer, down which they pass by gravity to delivery position, where an attendant may take them from the conveyer and place them in crates or cases.

By arranging and constructing the apparatus as described, the containers are presented to the heating and cooling elements in such position as to most thoroughly and uniformly pasteurize the contents, and by properly gearing the operative elements the time taken for travel of the containers through the pasteurizing and cooling chambers may be regulated to permit the proper treatment without loss of time and with a minimum of manual labor, so that the apparatus not only provides for effective pasteurization and cooling, but also for a saving of cost, both as to labor and for material used in the heating and cooling chambers.

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

1. In a pasteurizer, a casing, channel irons attached to opposite sides of the casing, cross bars supported on the lower flanges of said channel irons, runways extending longitudinally through the casing and supported on said cross bars, conveyer belts having rollers movably mounted on the upper flanges of said channels, division plates connecting the conveyer belts at opposite sides of the casing, means for actuating the conveyer belts, means for maintaining a pasteurizing temperature within the casing, each of said runways comprising individual supporting strips of different elevation, and a stop strip adjacent to the lower supporting strip.

2. In a pasteurizer, a pasteurizing chamber, a cooling chamber, means for successively advancing articles therethrough, a pipe located above said means and arranged to jet water onto said containers, a nozzle having an opening arranged to direct a fluid

across the path of the water delivered from said pipe and toward the containers, and a fan for forcing fluid medium through said nozzle.

3. In a pasteurizer, a pasteurizing chamber, a cooling chamber, a cooling-medium-containing pan located in said chamber and having a perforated bottom, an article carrying conveyer movable through the chamber below the pan, and a cooling coil interposed between the conveyer and the bottom of said pan.

4. In a pasteurizer, a pasteurizing chamber, a cooling chamber, a cooling-medium-containing pan adjustably located in said cooling chamber and having a perforated bottom, an article carrying conveyer movable through the cooling chamber below the pan, and a cooling coil interposed between the conveyer and the bottom of said pan.

5. In a pasteurizer, a pasteurizing chamber, a cooling chamber comprising a refrigerating portion and a relatively shallow primary cooling portion in open communication with the refrigerating portion, a partition between the refrigerating and primary cooling portions spaced from the bottom of the chamber to form a passageway, an article carrying conveyer movable in the chamber and through said passageway, means in the primary cooling portion for producing an initial cooling zone and means in the refrigerating portion for inducing a further cooling for articles passed through the chamber from the primary cooling portion.

6. In a pasteurizer, a pasteurizing chamber, a cooling chamber comprising a refrigerating portion and a relatively shallow primary cooling portion in open communication with the refrigerating portion, a partition between the refrigerating and primary cooling portions spaced from the bottom of the chamber to form a passageway, an article carrying conveyer movable in the chamber and through said passageway, means in the primary cooling portion for producing an initial cooling temperature, means in the refrigerating portion for inducing a further cooling for articles passed through the chamber from the primary cooling portion, means for supplying liquid to said chamber, and an overflow pipe at the intake end of the primary cooling portion whereby flow of liquid is induced from the refrigerating portion to the primary portion of said chamber.

7. A pasteurizer comprising a housing having an opening at one end, a partition dividing said housing horizontally to form upper pasteurizing and lower cooling chambers, means in the upper chamber for maintaining a pasteurizing temperature, cooling means in the lower chamber, an article carrying conveyer adapted for continuous travel through said chambers, means for guiding

said conveyer across the housing opening at an inward and upward incline above the partition and at an upper and outer incline below the partition, an automatic feeding device for delivering articles through said opening to the conveyer, and means for receiving said article from the conveyer at the delivery end of the cooling chamber.

8. In a pasteurizer, a housing divided into an upper pasteurizing chamber and a lower cooling chamber, one end of the housing being inclined outwardly from the top and bottom toward an opening intermediate the upper and lower edges of the housing, a conveyer guide within the housing adjacent to the opening and having inclined channels with the end of the housing, a conveyer extending continuously through the upper and lower portions of the housing and over said guide, the conveyer comprising division plates forming pockets opening outwardly toward the housing opening to automatically receive and deliver liquid containers through said opening, an automatic feeding device for delivering containers to the conveyer, an automatic conveyer for receiving the con-

tainers from the conveyer after travel thereof through the upper and lower portions of the pasteurizer.

9. In a pasteurizer, a pasteurizing chamber, a cooling chamber comprising a refrigerating portion, a cooling medium containing pan in said portion, means for conducting containers through the pasteurizing chamber and the refrigerating portion of the cooling chamber beneath the pan, a coil in the refrigerating portion beneath the pan and means for circulating brine through the coil.

10. In a pasteurizer, a casing having a longitudinal division partition dividing the casing into an upper pasteurizing chamber and a lower cooling chamber, the latter chamber having an offset relatively deep portion, a conveyer for passing articles progressively through the pasteurizing chamber and the cooling chamber, an ice pan in the relatively deep portion of the chamber and brine circulating tubes beneath the ice pan.

In testimony whereof I affix my signature.  
KURT R. GITTERMAN.