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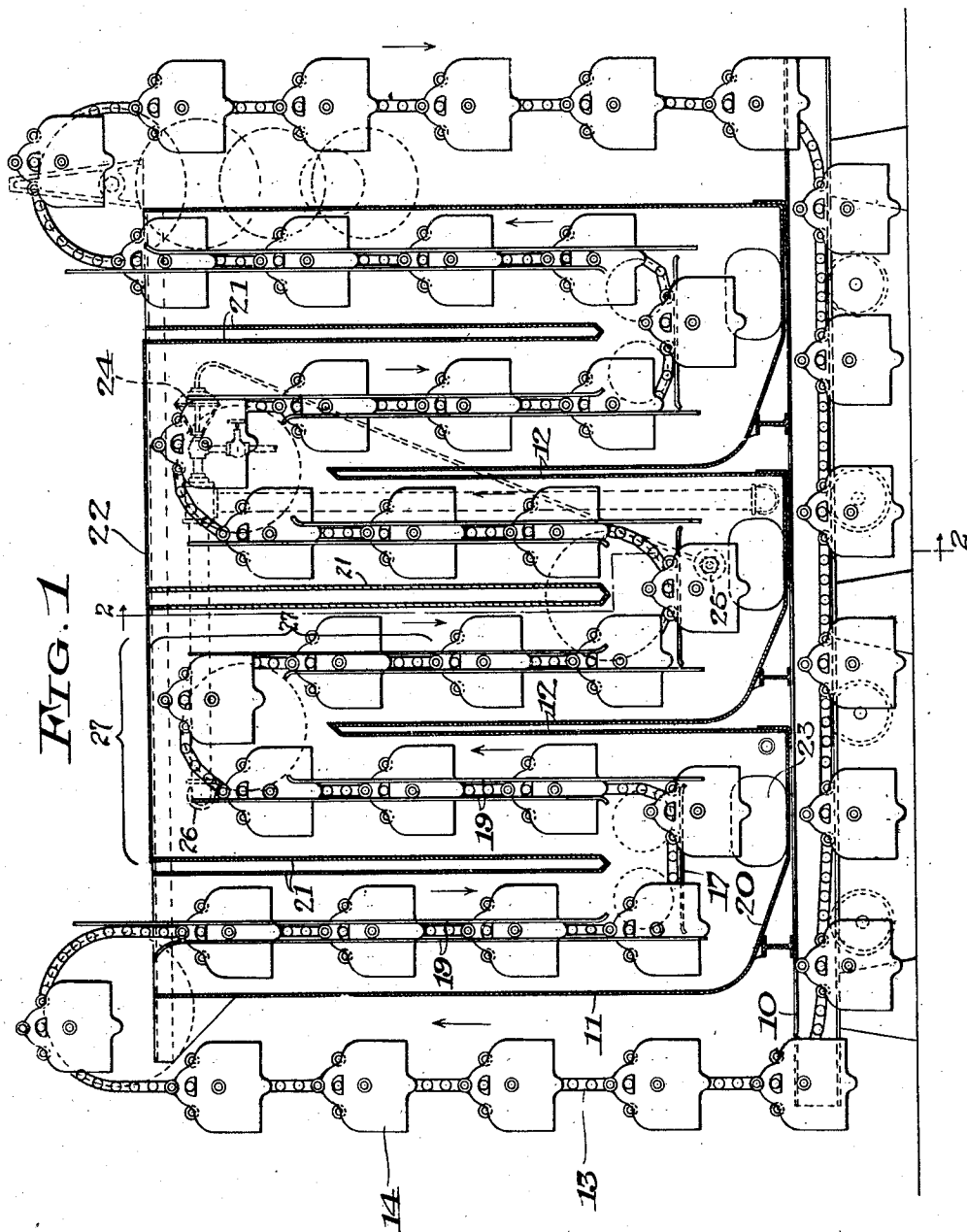
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1,749,150

PASTEURIZER

Filed March 5, 1923

2 Sheets-Sheet 1



WITNESSES

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FIG. 2

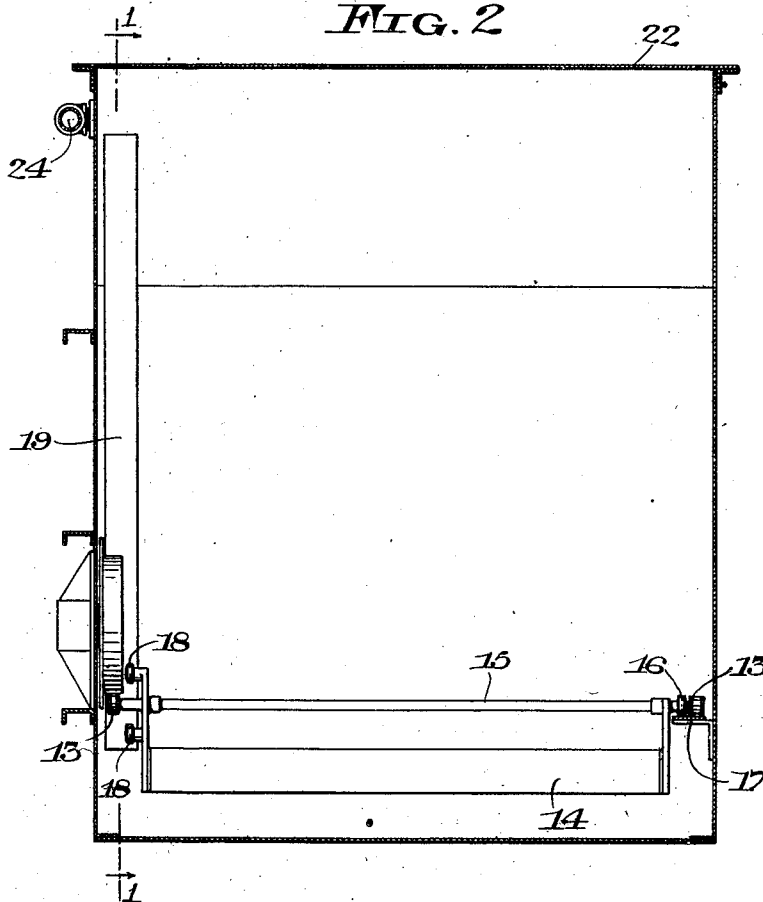
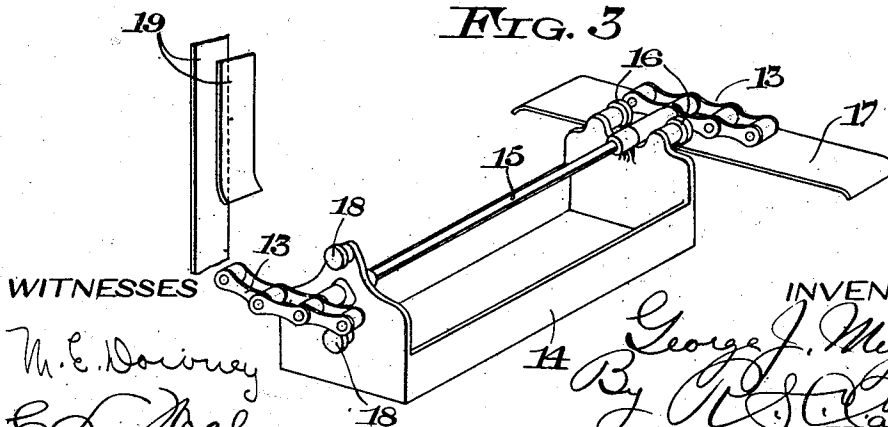


FIG. 3



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PASTEURIZER

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This invention has for its object to provide a pasteurizer in which the bottle carriers are suspended from traveling chains and in their sinuous course are maintained upright by guiding means at their respective ends co-operating with stationary guides.

Another object of the invention is to provide a pasteurizer of this type with inclined bottom walls beneath the sections in which the bottle carriers descend, whereby fallen bottles or other material may not stand in a vertical position and interfere with the travel of the bottle carriers.

Another object of the invention is to provide such a pasteurizer with a superheated zone immediately preceding the pasteurizing zone, where a temperature above the pasteurizing temperature is maintained to complete the preliminary heating of the bottles at a higher rate of increasing temperature than would otherwise be the case and, in effect, maintaining the rate of increase in temperature to which the bottles are subjected on entering the machine until they reach the pasteurizing temperature.

With the above and other objects in view the invention consists in the pasteurizer as herein claimed and all equivalents.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts in different views,

Fig. 1 is a longitudinal sectional view on line 1—1 of Fig. 2 of a pasteurizer constructed in accordance with this invention;

Fig. 2 is a transverse sectional view on line 2—2 of Fig. 1 thereof on a vertical plane to the right of the center of the middle section of the tank, as shown in Fig. 1, but showing only one of the bottle carriers, and

Fig. 3 is a perspective view of one of the carriers showing the vertical and horizontal guides therefor.

In these drawings 10 indicates a base or support on which is mounted a tank 11 formed in sections partially independent of each other as the result of double partitions or upstanding walls 12 between them. Conveyor chains 13 pass around suitable sprockets or guide wheels, shown in dotted lines, and are suitably driven so as to follow the arrows in

a sinuous course, descending to near the bottom of each tank section and then ascending to clear the partition walls 12 and repeating the operation in the next tank section. Bottle carriers 14 are suspended between the chains 13 at close intervals and are so mounted thereon as to be capable of remaining upright throughout their travel and it is one of the purposes of this invention to provide means to insure their remaining upright.

Each bottle carrier, as best seen in Fig. 3, consists of a rectangular basket-like container freely suspended on a rod 15, which connects the two chains 13. At one end each of the bottle carriers is provided with a pair of guide rollers 16 arranged in approximately the same horizontal plane as the rod 15 and these rollers, by their engagement with horizontal guide shelves 17 projecting from one side wall of the tank, support the bottle carrier against swinging movements whenever the travel is in a horizontal direction. At the other end each bottle carrier is provided with rollers 18 arranged in approximately the same vertical plane with the rod 15 so as to travel between pairs of parallel guides 19 projecting from the side walls on the other side of the tank to prevent the carriers from swinging or tilting whenever they are traveling vertically.

Each of the tank sections beneath the descending portion of the bottle conveyer is provided with a rounded inclined bottom 20 that will prevent bottles or other material standing upright thereon so as to interfere with the downward traveling of the bottle carriers. In the tank sections there are downwardly extending double partitions 21 resembling the partitions 12 between the tank sections, and a cover 22 extends across the tank from the first partition 21 to the last partition 21, thus enclosing a section of the upper part of the tank between the first and second partitions 21 in which is created a superheating zone where the water is maintained at a temperature somewhat higher than the pasteurizing temperature.

With the pasteurizer of this invention the bottle carriers are loaded with bottles as they rise at the left end of the machine and they

descend through the open portion of the first tank section while guided by the guides 19 so as to be incapable of tilting. They travel horizontally while guided by the guide 17 until reaching the guides 19, by which they are guided further during their upward travel into the superheating zone at the upper part of the enclosure formed between the cover 22 and the first two partitions 21. In this manner the bottle carriers travel through each of the succeeding tank sections which constitute the pasteurizing section of the machine always held upright by their engagement with the guides 17 and 19 and finally, after being lifted out of the tank, they are unloaded as they descend at the right hand end of the machine and are returned beneath the tank where the chains are supported by suitable guide rolls to repeat the operation. The bottle carriers are not only restrained against tipping to empty the bottles in the tank, but should a bottle fall to the bottom of the tank, it could not lodge in a position to obstruct the passage of the bottle carriers owing to the inclined tank bottoms beneath the descending portions of the bottle conveyor which serve to deflect such obstructions to the right of the tank sections where clean-out doors 23 are provided for their removal. By dividing off, by means of depending partitions 21, a portion of the tank and supplying it with thermostatically controlled heat regulating means 24 for admitting hot water thereto through a pipe 26, a superheated zone is provided as indicated at 27 where the water may be kept at a higher temperature than elsewhere to facilitate the rise in temperature of the bottles when they approach the pasteurizing section. The thermostatically controlled heat-regulating means 24 may consist of a pipe 26 conducting water from near the bottom of the second tank section to the beginning of the superheated zone in the first tank section, such water being impelled and heated by the injection of steam from a thermostatically controlled steam valve. By locating the thermostat 25 for such heat regulating means in the pasteurizing section, it is possible to automatically increase the temperature of the superheated zone whenever the bottles are delivered to the pasteurizing section at a temperature less than the pasteurizing temperature.

While three tank sections are shown in the drawing, it will, of course, be understood that any number may be used.

In practice for determining temperatures a traveling recorder is used having a thermometer inserted into a bottle and attached to a recording mechanism operated by a clock. This gives the exact rise in temperature by degrees Fahrenheit for practically every minute of travel through the machine. The temperature inside the bottle is approximately 40 to 50 degrees lower than that of the pas-

teurizing medium, at least at the beginning of pasteurization, and at this time there is a very rapid rise in temperature, but as this difference becomes less when the pasteurizing temperature is approached, the rise becomes slower and it is for the purpose of speeding up this increase of temperature near the pasteurizing point, that the superheating zone is adopted.

From heat charts obtained in this manner in the use of machines without the superheating zone feature, it is found that the temperature rises from 20 degrees Reaumur to about 45 degrees in ten minutes and that it takes about twelve minutes to go from 45 degrees to 48 degrees, and as it is important not to go above 48 degrees or whatever temperature is desired, to avoid burning or giving the goods an off taste, and as it also requires a definite time at this temperature, the capacity of the machine is considerably reduced by the presence of the curve or the slow increase in temperature at that point. This is the purpose of the superheating zone where the temperature of the medium will be carried 5 or 8 degrees above pasteurization, and this zone is so arranged that it will require about five or eight minutes for the goods to pass through it and be quickly brought up to the pasteurizing temperature or even slightly above for a minute or less, which would not be detrimental. The goods will then descend into the pasteurizing section to be maintained at the proper temperature and they will remain there for the full twenty minutes, that is the temperature of this section will be maintained at that during the travel of the goods through the pasteurizing section, which will take about twenty minutes time.

What I claim as new and desire to secure by Letters Patent is:

1. A pasteurizer comprising a tank having a bottle conveyor passing therethrough provided with suspended bottle carriers, stationary guides within the tank, and guide means carried by the bottle carriers for engagement with said guides to prevent the bottle carriers from tilting during their travel through the tank.

2. In a pasteurizer, a tank, a bottle conveyor passing through the tank and provided with suspended bottle carriers, and means for preventing the tilting of the bottle carriers comprising vertical guides at one side of the tank and horizontal guides at the other side of the tank, and guide means at the respective ends of the bottle carriers for engaging the vertical guides during the vertical movements of the bottle carriers and for engaging the horizontal guides during the horizontal movements of the bottle carriers.

3. In a pasteurizer, a tank, a bottle conveyor passing therethrough comprising suitably supported and driven chains, cross-bars connecting the chains, bottle carriers sus-

pended from the cross-bars, and means for preventing the bottle carriers from tilting comprising vertical guides at one side of the tank, rollers on one end of the bottle carriers engaging with said guides during the vertical movements of the bottle carriers, horizontal guides at the other side of the tank, and rollers on the other end of the bottle carriers for engaging said horizontal guides during the horizontal movements of the bottle carriers.

4. In a pasteurizer, a continuous heat-exchanging passageway having a pasteurizing section, means for conveying material through the passageway for the purpose of pasteurizing and cooling, and a superheated section of the passageway located just preceding the pasteurizing section where a higher temperature is maintained for the purpose of continuing the rapid rise in temperature of the material to be pasteurized.

5. In a pasteurizer, a continuous heat-exchanging passageway having a pasteurizing section, means for conveying material through the passageway for the purpose of pasteurizing and cooling, a superheated section located just preceding the pasteurizing section where a higher temperature is maintained for the purpose of continuing the rapid rise in temperature of the material to be pasteurized, and means for controlling this temperature so that the material will be of the pasteurizing temperature when it enters the pasteurizing section.

6. In a pasteurizer, a continuous heat-exchanging passageway, means for expediting the operation of raising the temperature of the goods to pasteurizing temperature comprising in combination with the conveyor for conducting material through the passageway and the pasteurizing chambers of the passageway maintained at pasteurizing temperature, of a superheated chamber of the passageway through which the conveyor passes before entering the pasteurizing chamber, said superheated chamber being maintained at a temperature higher than that of the pasteurizing chamber.

In testimony whereof, I affix my signature.

GEORGE J. MEYER.