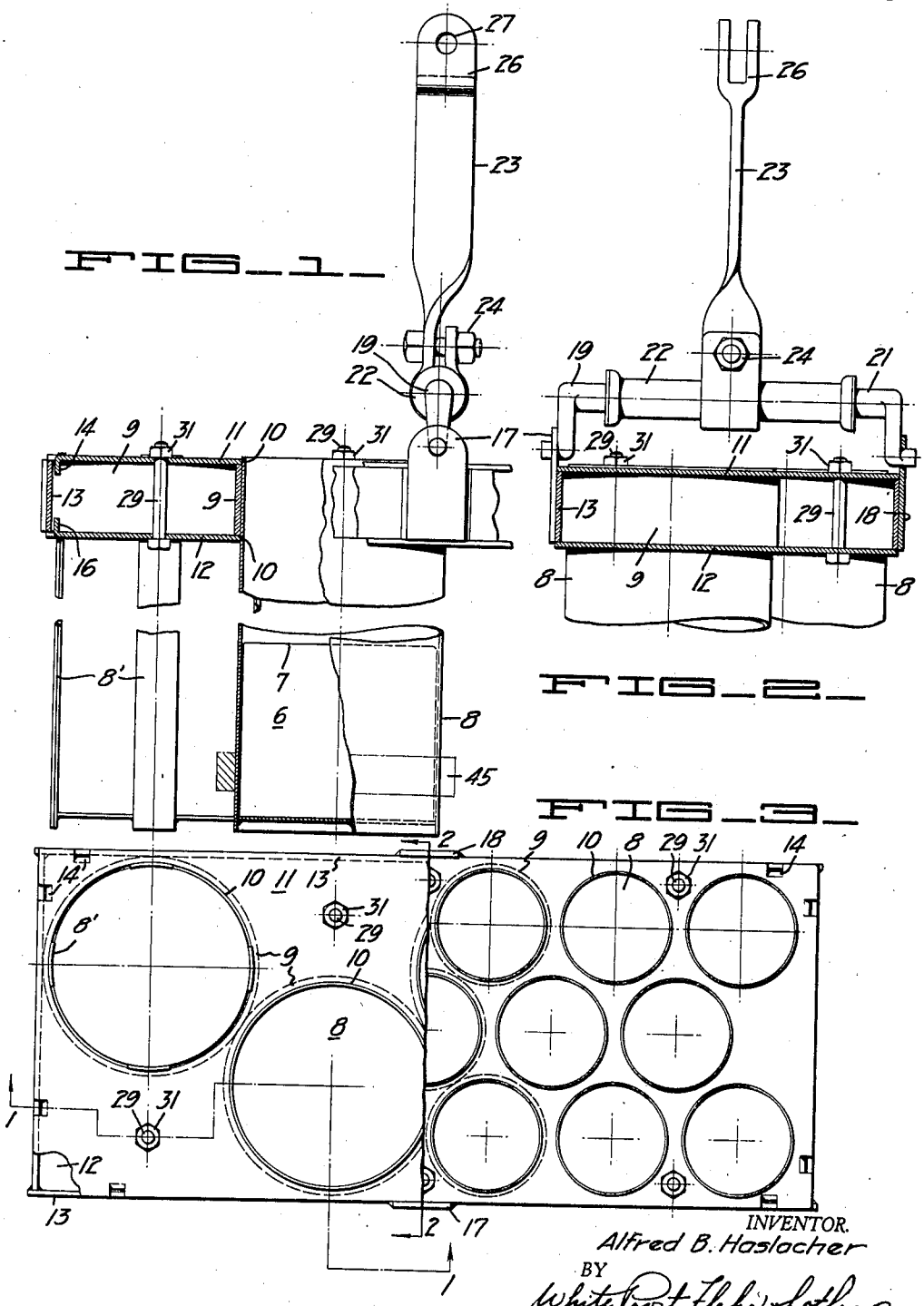
Feb. 13, 1934. A. B. HASLACHER 1,947,082

REFRIGERATION MECHANISM

Filed Nov. 2, 1931 2 Sheets-Sheet 1



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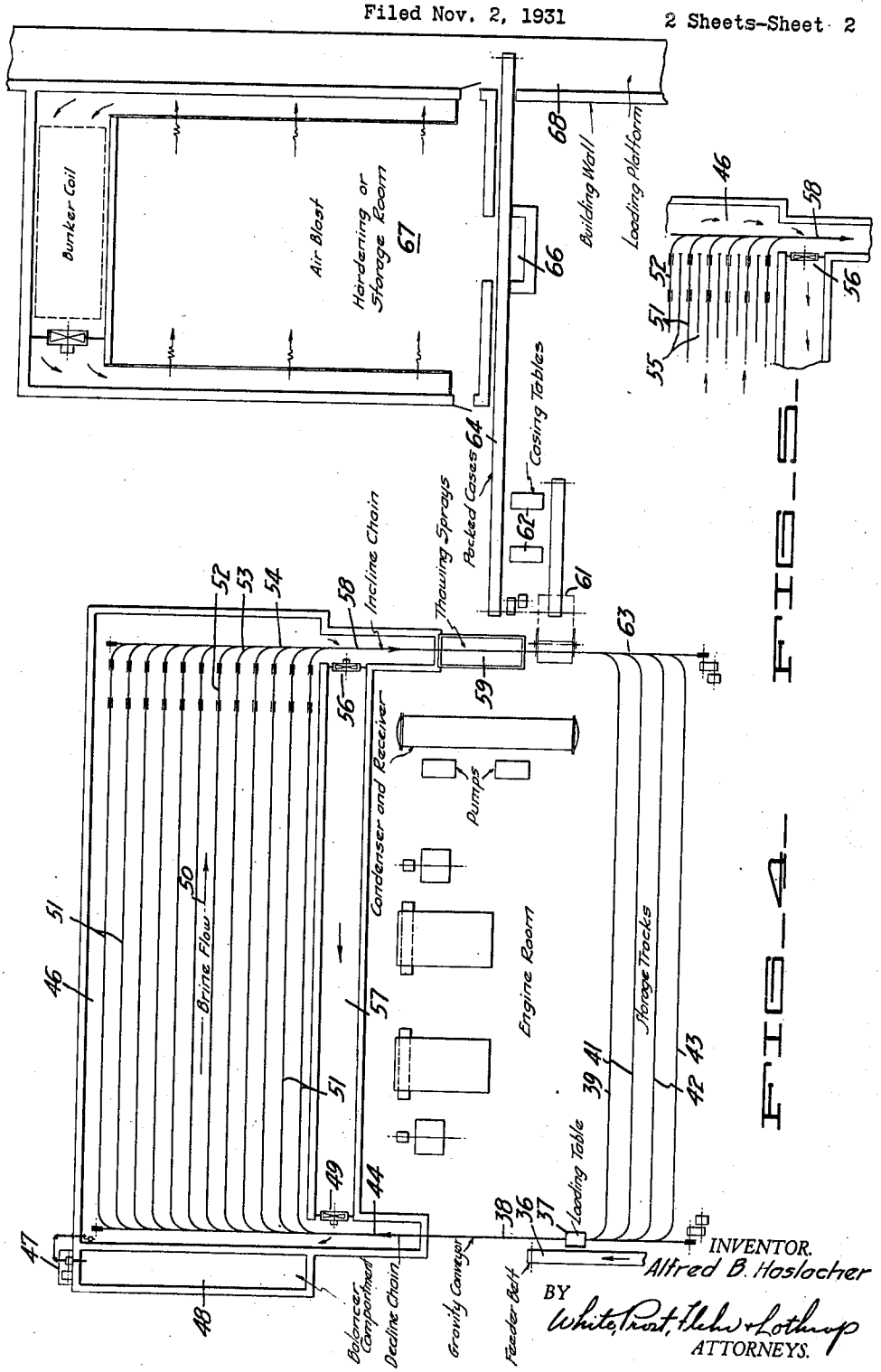


FIG-4-

FIG-5-

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REFRIGERATION MECHANISM

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7 Claims. (Cl. 62—169.1)

My invention relates in general to means for reducing the temperature of commodities and is particularly concerned with mechanism and means employed to produce a very rapid reduction of the temperature of foodstuffs and similar substances which have been introduced into packages along with a vehicle such as water and a preservative such as sugar and while in the packages are subjected to a lowering of temperature.

An object of my invention is to provide an efficient and rapid means for reducing the temperature of the contents of packages as above described.

An additional object of my invention is to provide means for grouping such packages so that they may be frozen and handled with equipment now existing in standard refrigeration plants such as ice plants.

An additional object of my invention is to provide a simple means for carrying out a refrigeration process primarily based upon the cooling of packages of foodstuffs and similar substances.

The foregoing and other objects are attained in the embodiment of the invention shown in the drawings, in which

Figure 1 is a cross section, the planes of which are indicated by the lines 1—1 of Figure 3, showing containers and supporting mechanism constructed in accordance with my invention.

Figure 2 is a cross section, the plane of which is indicated by the line 2—2 of Figure 3, also showing the containers and supporting mechanism in accordance with my invention.

Figure 3 is a composite plan of the supporting mechanism and containers shown in Figures 1 and 2, the left hand half of the figure showing the support arranged for the reception of relatively large containers and the right hand portion of the figure showing the support arranged for the reception of relatively small containers.

Figure 4 is a diagrammatic plan of a refrigeration station arranged in accordance with my invention to facilitate the use of the refrigeration mechanism for cooling packages of foodstuffs and similar products.

Figure 5 shows in diagrammatic plan a modified portion of a station such as is disclosed in Figure 4.

In its preferred form, the refrigeration mechanism of my invention comprises a frame which is adapted to be received on a conveyor for propulsion and is provided with means for removably and interchangeably holding the containers of different sizes and adapted to receive packages of foodstuffs and similar material, the arrangement being designed to operate not only in a standard ice manufacturing plant, but also in the type of plant herein described.

Although the refrigeration mechanism of my invention is susceptible to wide variation depending upon the environment in which it is used, I show a preferred form herein.

Ordinarily the product to be cooled is contained in a package 6 having a tight closure 7 thereon. The package is customarily fabricated of fiber board or any other suitable material such as tin, glass or wood, and is usually a cylinder having any regular geometrical shape in cross section. The package is usually circular with a volume equivalent to one of the standard measures, for instance, the packages are designed to hold a gallon of substance to be cooled, or alternatively, a pint thereof.

Adapted to receive the package 6 and a plurality of other similar packages is a container 8 which, in the present instance, is substantially a cylinder having a suitable cross section. In the example shown, it has a circular contour and sufficient depth to receive several of the packages 6. Preferably the packages are introduced into the container 8 through the open upper end of the container and since the length of the container is usually relatively great, the packages would be considerably damaged if they were dropped into the container for the full depth thereof. To obviate this difficulty I preferably fabricate the container 8 so that its inside dimension or interior cross sectional diameter is only slightly larger than the outside dimension or external cross sectional diameter of the package 6, or, in other words, the shape of the interior of the container 8 in cross section is identical with the shape of the exterior of the package 6 in cross section, but the dimensions of the container 8 in cross section are just slightly larger than the dimensions of the package 6 in cross section. By virtue of this arrangement, a package 6 introduced into the open upper end of the container 8 and released falls gently, inasmuch as air is compressed ahead of the falling package and can escape only relatively slowly around the cylindrical periphery thereof, thus forming a cushion below the package to prevent damage or injury thereto. This effect is not utilized, however, if a skeleton container 8' is utilized in conjunction with impervious packages 6' as shown in Figure 1.

I preferably provide means for supporting a plurality of containers 8 in an upright or substantially vertical position so that the containers can be subjected in groups to a cooling medium

such as a brine bath. To this end the upper portion of the container 8 is circumscribed by a collar 9 which forms a projection from the general exterior contour of the container and is clamped between a pair of plates 11 and 12 which are provided with apertures 10 designed to pass the body of the container 8 but to grip or clamp the collar 9. The plates 11 and 12 are removably fastened on a frame 13 which is fabricated of structural shapes and is abutted by ears 14 and 16 on the plates 11 and 12 in order that the plates may be accurately positioned not only with respect to the frame 13 but also with respect to each other so that the apertures therein are held in proper alignment.

The frame 13, if the mechanism is used in a standard ice plant, is of a size readily interchangeable with a standard size ice can, and is provided at opposite sides with a pair of projecting tabs 17 and 18 which are apertured to receive crank portions 19 and 21 of a cross bar 22. Fastened to the cross bar is a link 23 at its lower end removably held by a nut and bolt connection 24 and at its upper end bifurcated as at 26 and pierced as at 27 to receive a roller or hook or other fastening means designed to support the entire assembly on a conveyor preferably of the mono-rail type.

The plates 11 and 12 are preferably releasably held on the frame 13 by means of through bolts 29 and nuts 31 so that the plates 11 and 12 can readily be interchanged for other plates having different sized apertures therein designed to receive receptacles of different size for holding smaller or larger packages. As an example, in Figure 3, the plates shown therein on the left hand side are designed for holding gallon containers and the right hand side of the figure shows plates designed to receive pint containers. By simply removing the through bolts 29 and nuts 31 from the plates 11 and 12 these plates can be separated from the frame 13 and the containers 8 removed therefrom. These plates can then be replaced with other plates having different sized apertures therein and holding different sized containers.

After the packages 6 have been introduced into the containers 8, I preferably proceed to effect a cooling of the containers, the packages and their contents. As particularly disclosed in Figure 4, this is effected by means of a feeder belt 36 which brings the various packages 6, say from a packing house, to a loading table 37, from which the packages 6 are introduced into containers 8 supported on a conveyor 38 preferably of the mono-rail type. Leading to the loading table are various conveyor sections 39 to 43, inclusive, which act as storage tracks for empty container groups. These groups are advanced along the storage tracks to the loading table as required to provide suitable carrying capacity. When all of the containers of a group are loaded with the packages, the group is advanced along the track 38 and by virtue of a decline 44 of any suitable kind enters into a brine tank 46 which is preferably below the conveyor 38. The conveyor is preferably arranged so that containers are gently lowered by gravity into brine in an extension of the side or end of the tank. The brine is usually of 1250 degrees gravity, and if necessary the containers can be weighted as at 45 to submerge a proper distance in the brine. The brine in the extension, however, provides a dashpot action and retards the rate of travel down the gradient.

The brine tank is provided with a balancing pump 47 for maintaining the level of brine in the tank under control of a float, by pumping brine back and forth between the tank 46 and balancing tank 48 to compensate for the entry into or withdrawal from the brine tank of various container groups. The tank 46 is also provided with a circulating propeller 49 so that brine is circulated in the direction of the arrows 50 thereby establishing a uni-directional flow, which as shown in Figure 4 is from left to right. The groups of containers 8, after having passed the decline 44, are switched onto any one of a plurality of conveyor sections 51 which overlie the brine tank. These sections are preferably mono-rail tracks of the usual sort. The container groups, being immersed in the brine, are impelled along the conveyor section by virtue of the brine flow, which is uni-directional and of considerable velocity. If desired, and as shown in Figure 5, the tank 46 can be divided into channels by walls 55 to confine the brine flow. The container groups can be advanced uniformly and slowly through the brine which is preferably maintained at a temperature of the order of —20 degrees Fahrenheit, or they can remain stationary for a short period during which rapid freezing takes place, or any other mode of advance can be effected. If desired, the conveyor sections over the brine tank can be inclined slightly in a downward direction so that gravity assists in moving the container group.

At the outlet end of the brine tanks the container groups are carried by gravity or if desired by suitable propelling means 52 over switches 53 onto a return conveyor track 54, while the brine is carried by another circulating propeller 56 into an evaporating compartment 57 through which it is returned to the propeller 49 and re-circulated. The container groups are carried by any suitable means such as an inclined chain 58 up and out of the brine tank, along a conveyor which extends over a projection on the end or side of the brine tank. At the point of leaving the tank 46, the containers pass through a warm spray 59 or alternatively are dipped into a thawing well to melt frost which has formed between the packages 6 and the containers 8, in order that the packages may be readily removed. A machine 61 is provided for upending the containers 8 so that packages therein will be gently discharged by gravity, the close fit of the packages in the containers causing a dashpot effect.

The discharged packages 6 are placed on casing tables 62 while the containers are returned by gravity through switches 63 to the storage tracks 39 to 43, inclusive, thereby completing the closed circuit of the conveyor system. The packages 6 on the casing table 62 are carried by a conveyor 64, preferably through an extension 66 of a hardening or storage room 67, wherein they are held for any desired time, and from which they are sent out on the conveyor 64 to a loading platform 68, having been completely processed in accordance with my invention.

I claim:

1. A refrigeration mechanism comprising a frame, means for suspending said frame, a pair of plates mounted on said frame, a collar clamped between said plates, and a container mounted on said collar.

2. A refrigeration mechanism comprising a frame, a container having a collar thereon, and a pair of parallel plates fastened to said frame and clamping said collar between them to position said container.

3. A refrigeration mechanism comprising a frame, a pair of plates having apertures therein, means for fastening said plates to said frame, a container adapted to pass through the apertures in said plates, and a collar on said container adapted to be clamped between said plates.

4. A refrigeration mechanism comprising a support, a container having an enlargement thereon, and a pair of plates engaging opposite sides of said enlargement and clamping said enlargement between them and engaging said support to position said container on said support.

5. A refrigeration mechanism comprising a support, a container having an enlargement thereon, and a pair of plates clamped to engage opposite sides of said enlargement and removably fastened to said support to position said container releasably on said support.

6. A refrigeration mechanism comprising a brine tank, means for establishing a uni-directional brine flow in said tank, a closed circuit conveyor having a portion extending over said brine tank, and means for supporting a container in said brine tank and on said conveyor whereby said brine flow is effective to propel said container along said portion of said conveyor.

7. A refrigeration mechanism comprising a brine tank, means for establishing a uni-directional flow of brine in said tank, a closed circuit conveyor having a portion extending over said brine tank, a container, and means for supporting said container for movement on said conveyor, said conveyor, said portion of said conveyor being relatively low to immerse said container in said tank whereby said container is advanced on said conveyor under the influence of said flow of brine.

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