

Sept. 8, 1931.

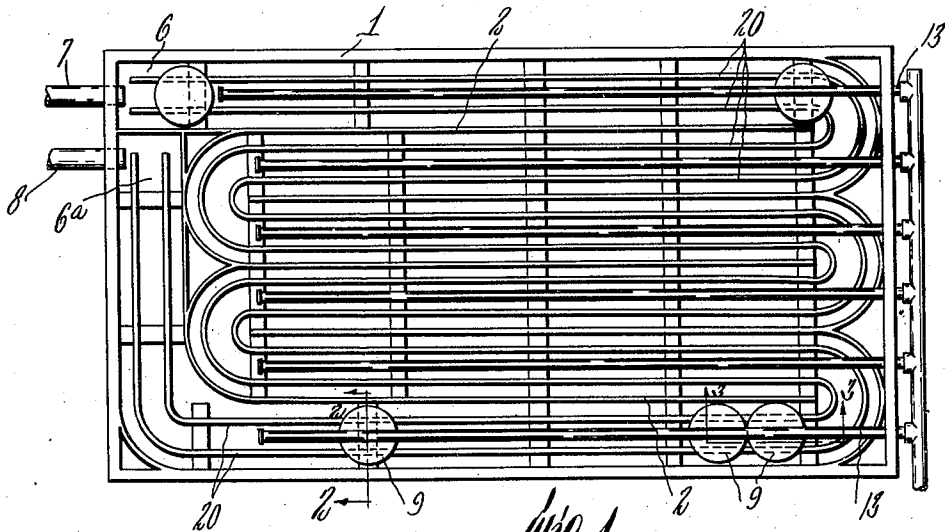
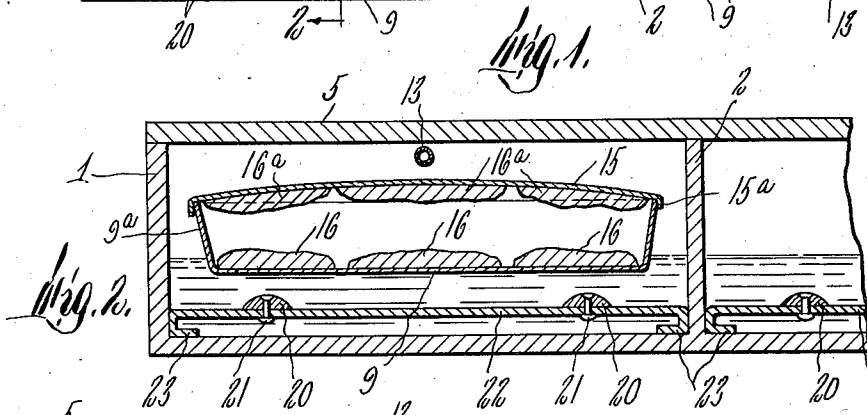
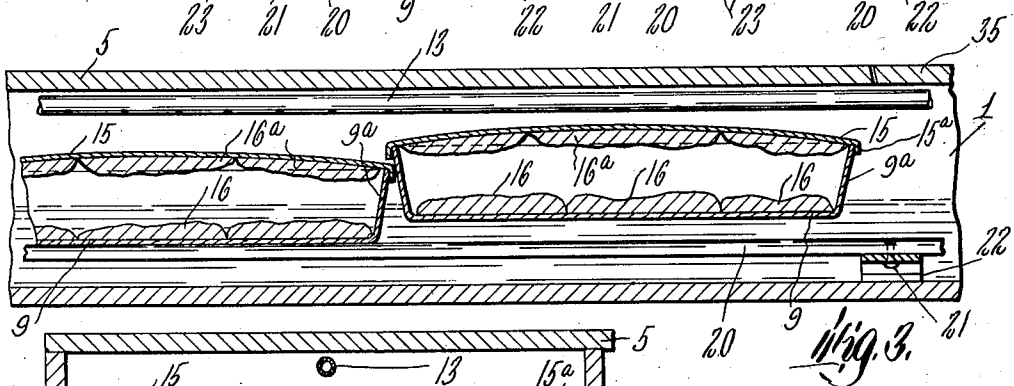
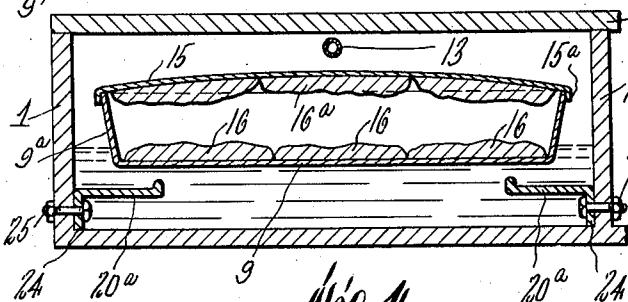
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1,822,718

FREEZING APPARATUS

Filed May 27, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

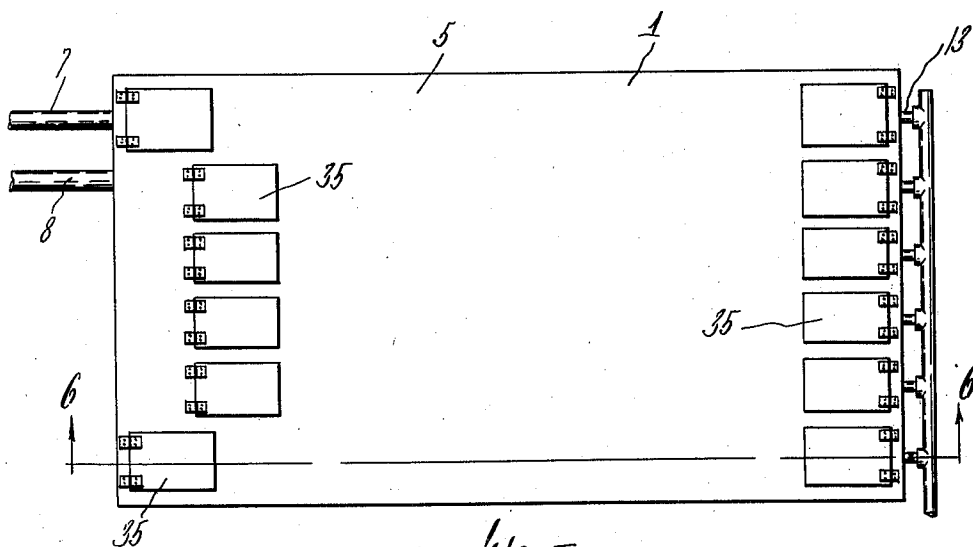


Fig. 5.

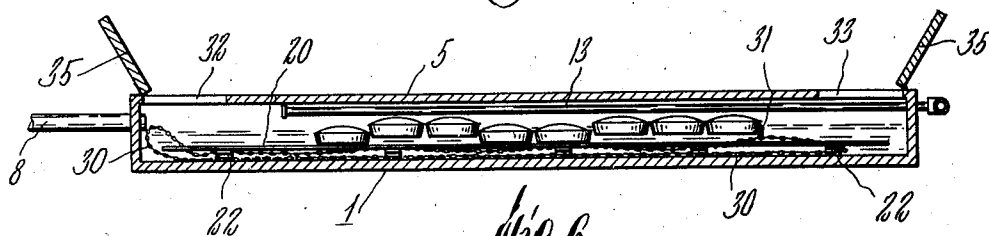


Fig. 6.

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UNITED STATES PATENT OFFICE

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FREEZING APPARATUS

Application filed May 27, 1930. Serial No. 456,149.

This invention relates to apparatus for freezing fish and other comestibles, the apparatus being adapted to practice a method which consists in establishing a moving liquid
 5 having a freezing point below that of the material to be frozen, and with a movement from a loading point to a discharge point, said liquid having a temperature below the freezing point of the material, arranging
 10 said material in buoyant receptacles and subjecting the receptacles to movement through the flow of the liquid and to the temperature of the liquid as it is moved.

The apparatus to which my invention relates comprises a substantially horizontal container internally partitioned to form a sinuous runway which includes elongated major portions extending side by side, and shorter neck portions connecting the major
 20 portions in pairs, the runway being adapted to conduct a moving refrigerating liquid and buoyant receptacles floating thereon, in a sinuous path from a loading point to a discharge point.

The apparatus is provided with means for maintaining the moving liquid at a predetermined level, which is preferably only as high above the bottom of the runway as is required to permit free movement of the receptacles.

When a receptacle becomes leaky and receives some of the liquid in the runway, it is liable to sink and bear on the bottom of the runway, so that it becomes a non-floating receptacle, progressive movement whereof is
 35 prevented by frictional contact with the runway bottom, so that progressive movement of following floating receptacles is prevented. It has therefore been necessary heretofore at times to uncover the runway and remove any
 40 non-floating receptacle or receptacles therein by hand.

The object of my invention is to so condition the runway that a non-floating receptacle or receptacles therein may be automatically moved progressively to the discharge end by force exerted thereon by following floating receptacles.

I accomplish this object by providing a longitudinal track located in the runway
 50 above the bottom thereof and below the pre-

determined liquid level, in position to support a non-floating receptacle, said track being formed to offer only a minimum frictional resistance to movement of a non-floating receptacle thereon, so that automatic propulsion of such non-floating receptacle to the discharge end by a floating receptacle or receptacles is permitted.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a top plan view of a freezing apparatus provided with a track conditioned in accordance with my invention.

Figure 2 is a fragmentary section on line 2—2 of Figure 1.

Figure 3 is a fragmentary section on line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 2, showing a modification.

Figure 5 is a top plan view, showing the apparatus with the tank cover in place.

Figure 6 is a section on line 6—6 of Figure 5.

The same reference characters indicate the same parts in all of the figures.

In the drawings, 1 designates a substantially horizontal container or tank, having a cover 5 and internal partitions 2, forming a sinuous runway composed of elongated major portions located side by side, and shorter neck portions, connecting the major portions in pairs.

The inlet end 6 of the runway is extended to the end of the container, to form a loading end, and the opposite end 6a is extended to a point adjacent the loading end, to form a discharge end.

A liquid such as brine, having the temperature desired, is delivered through a pipe 7, and discharged through an overflow pipe 8, said pipes being arranged to maintain a constant predetermined liquid level through the apparatus, a constant progressive flow of liquid being maintained from the loading end to the delivering end. Buoyant receptacles 9 are provided, adapted to contain charges 16 of material to be frozen, and to be moved by the liquid in the runway from the end 6 to the end 6a.

Each receptacle is provided with a cover

15, adapted to bear separably on and float with a receptacle 9, and provided with a marginal flange 15a. The body of the cover has a slightly curved or crowning liquid distributing top surface, so that liquid discharged by a conduit 13 on the central portion of said surface flows radially to the margin thereof.

The deflectors are movable with the receptacles through the receiving and discharge ends of the runway, so that when each receptacle reaches the discharge end, it may be removed with its frozen charge.

Latent heat from the charges 16 is transferred through the bottom surfaces of the receptacles downward to the body of liquid.

Each receptacle has a cover 15, which floats therewith. The apparatus preferably includes conduits 13 supported above the receptacles and adapted to discharge a refrigerating liquid upon the covers 15, and thereby cause an upward transference of heat from the charges through the covers to the liquid discharged thereon.

In carrying out the present invention, I condition the apparatus by providing a longitudinally extending track, composed of track members 20, located above the bottom of the tank 1, and below the predetermined liquid level in the runway. Said track members extend from the loading to the delivering end, and are centrally arranged in the runway in position to support any receptacle which has become leaky and therefore non-floating, and support such non-floating receptacle in the path of a floating receptacle following it, as indicated by Figure 3.

The track members are formed to present such narrow bearing or tread portions to the bottoms of non-floating receptacles resting thereon, that frictional resistance by the track members to progressive movement of such receptacles on the track is not sufficient, under average conditions, to prevent following floating receptacles from pushing non-floating receptacles along the track to the discharge end of the tank.

The average conditions are such that there is not liable to be a sufficient number of non-floating receptacles to constitute an obstruction which is immovable by the floating receptacles, the number of the latter usually largely exceeding that of the non-floating receptacles.

The track members 20 are preferably of the form in cross section shown by Figure 2, their tread surfaces being convex. They may be fixed by rivets 21, or otherwise, to cross ties 22, having feet 23 bearing on the bottom of the tank.

In Figure 4 the track members are shown as narrow flat sided strips 20a, having flanges 24 attached by bolts 25 to the portions of the tank constituting the sides of the runway, the strips having narrow tread faces on

which the bottoms of non-floating receptacles may slide.

I am not limited to the specific forms of track herein shown, and may employ any suitable relatively frictionless track means slightly raised above the level of the tank bottom and adapted to prevent contact of a non-floating receptacle with said bottom, and to permit the described propulsion or progressive movement of a non-floating receptacle by a following floating receptacle.

It will now be seen that under average conditions, the loss of time heretofore involved by the operation of locating and removing a non-floating receptacle or receptacles, is entirely obviated, each non-floating receptacle being automatically moved to the discharge end.

To permit quick removal of the receptacles from the runway in case the described progressive movement of the receptacles is prevented by an unusual number of non-floating receptacles, I may provide manually operable removing means shown by Figure 6, including endless cables 30 manually movable from the exterior of the tank, and adapted to quickly remove from the major portions of the runway all of the receptacles therein including the floating and non-floating receptacles.

A cable 30 is provided in each major portion of the runway and has a lower stretch resting loosely on the runway bottom, and an upper stretch extending loosely across the upper sides of the ties 22, and between the track members 20. To the upper stretch of each cable is detachably secured a pulling member 31, adapted to bear on a receptacle at one end of a major runway portion, and movable by a pull exerted on the cable to pull all of the receptacles in said portions toward an opening 32 in one end portion of the tank cover, through which opening the pulled receptacles may be lifted one by one.

The cable is sufficiently slack to enable an operator to lift a portion thereof to the opening 32, so that the cable may be pulled by an operator outside the tank. When the pulling member 31 is not applied to the cable, the latter is inoperative and does not prevent the described progressive movement of the receptacles. When it becomes necessary to use the cable, the pulling member is secured to a cable portion under an opening 33 in the opposite end of the tank cover. The member 31 may be a bar long enough to bear on and be supported by the tracks 20, and wide enough to project upward from the tracks into the path of the receptacles. The cable is then pulled toward the opening 32 by an operator adjacent said opening, the member 31 being thus caused to pull the assembled receptacles to a point under the opening, thus permitting the upward removal of the re-

ceptacles from the runway. The openings 32 and 33 are normally closed by hatches 35.

I claim:

1. In freezing apparatus comprising a
5 horizontal container having a cover and internally partitioned to form an elongated runway, including major portions located side by side, and connecting neck portions, said runway having a loading end and a
10 discharge end, and adapted to conduct from end to end a moving refrigerating liquid and buoyant receptacles floating therein, and means for maintaining the moving liquid at a predetermined level; a longitudinally extending track located in the runway above
15 the bottom thereof and below the predetermined liquid level, in position to support a non-floating receptacle, in the path of a floating receptacle so that a nonfloating receptacle may be propelled to the discharge end
20 by a following floating receptacle.

2. Freezing apparatus as specified by claim 1, characterized by means normally operable at the exterior of the tank for pulling
25 all of the receptacles in any major portion of the runway to a point under one end of the cover, so that they are removable through an opening in the cover.

3. Freezing apparatus as specified by claim 1, characterized by endless cables in
30 the major portions of the runway, each cable being operable through an opening in one end of the tank cover, and having a detachable pulling member adapted to move the receptacles in a major portion of the runway
35 to position under said opening.

In testimony whereof I have affixed my signature.

MICHEL P. VUCASSOVICH.

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