Feb. 23, 1932. S. DANIELS 1,846,192

MILK CHEST

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Fig. 1.

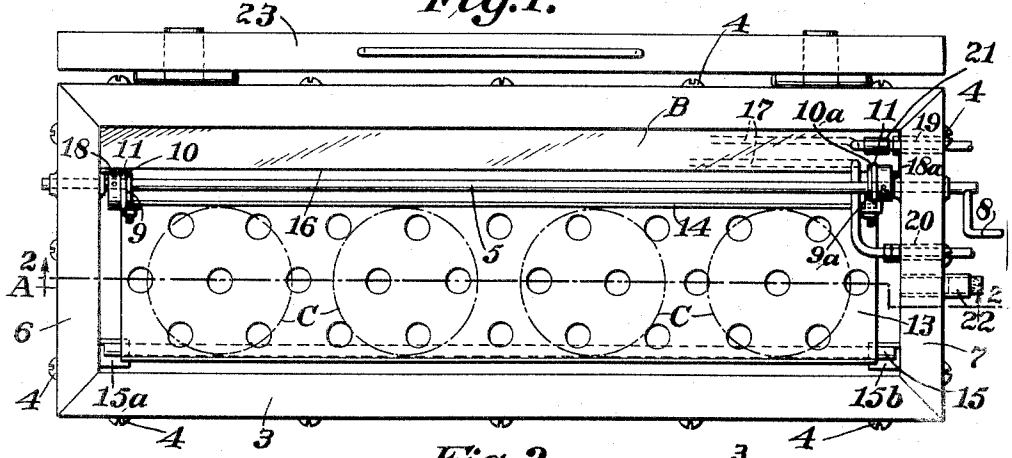

Fig. 2.

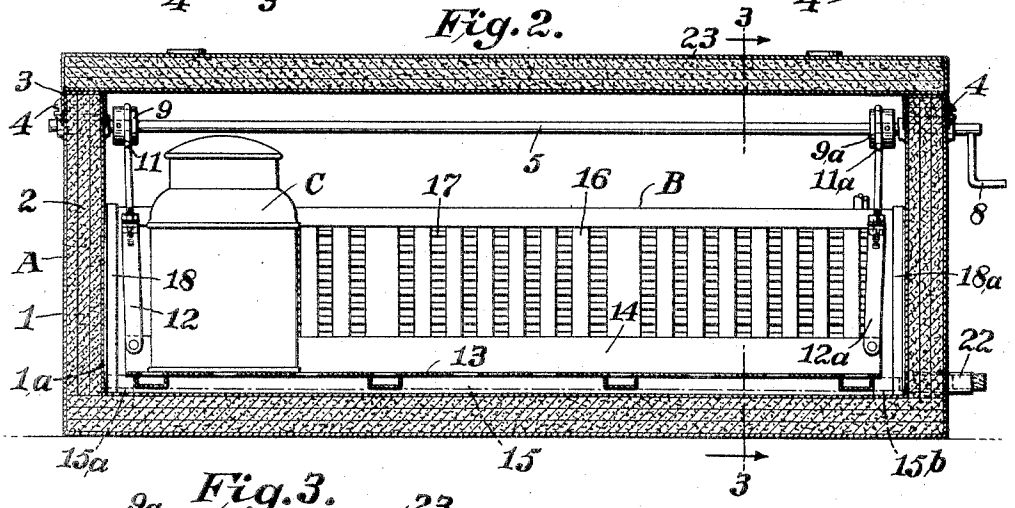

Fig. 3.

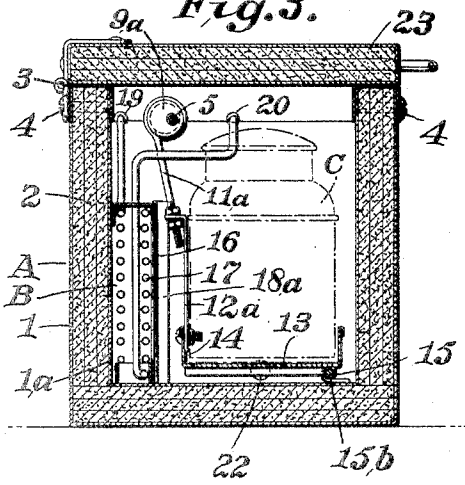

Fig. 7.

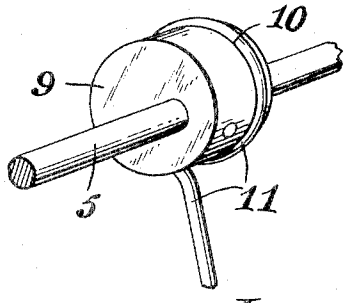

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Fig. 4.

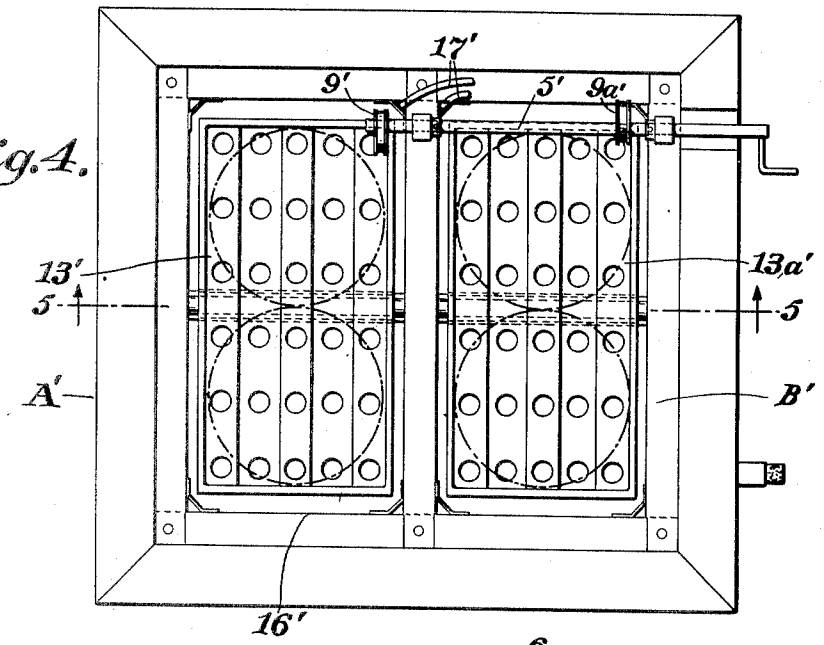
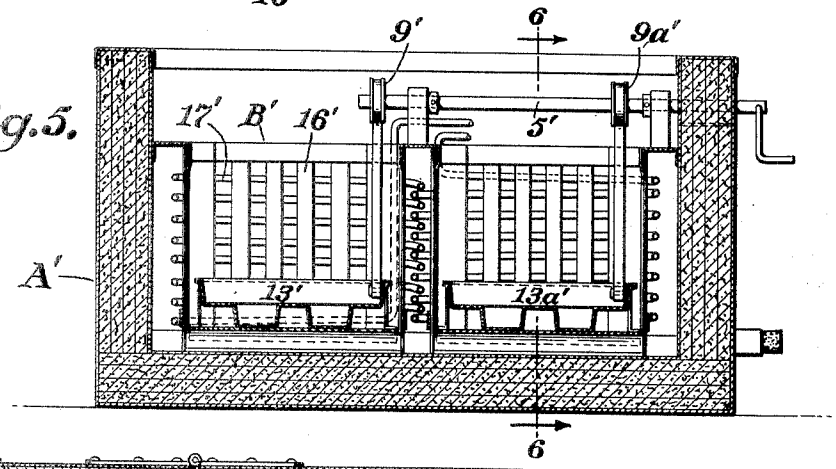


Fig. 5.



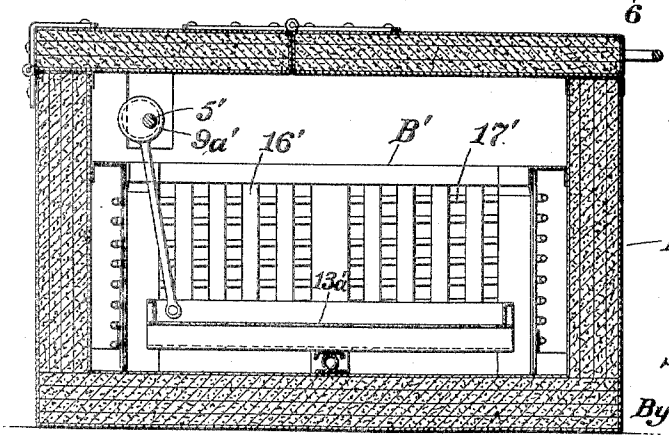


Fig. 6.

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UNITED STATES PATENT OFFICE

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MILK CHEST

Application filed July 3, 1930. Serial No. 465,746.

This invention comprises certain new and useful improvements in milk chests, and one of its objects is to provide such a chest which will be durable, economical, simple in construction and efficient in operation.

Another object is to provide such a chest in which quantities of fresh milk may be stored and preserved in its fresh state in a novel and efficient manner.

Another object is to construct a chest of a character in which milk containers may be stored and around which a cooling medium is circulated. A further object is to provide a novel means for agitating and circulating said cooling medium. A further object is to provide agitating means which may be operated either manually or mechanically and other objects will hereinafter appear.

In order to more clearly comprehend the present invention, reference is made to the accompanying drawings, in which

Figure 1 is a plan view of the chest with the lid open.

Figure 2 is a longitudinal section on line 2—2 of Figure 1 showing a single milk can in place.

Figure 3 is a transverse section on the line 3—3 of Figure 1.

Figure 4 is a plan view of a modification of the device.

Figure 5 is a longitudinal section thereof on line 5—5 of Figure 4.

Figure 6 is a transverse section on the line 6—6 of Figure 4.

Figure 7 is a detail view in perspective of one of the cams and associated parts.

The chest A is constructed of nested, sheet metal tanks 1 and 1*a*, spaced apart, and between which is interposed a heavy layer of insulation 2 composed preferably of layers of corkboard. All the joints and seams of these tanks are sealed by soldering. The layers of said corkboard are individually coated or impregnated with hydrolene cement and then united in lapped formation so as to break the joints as much as possible thereby increasing the insulating qualities thereof. This insulation, as one unit, is then given a final coating of said cement and is placed in position between the walls and bottom of said nested tanks. An inverted U shaped cap 3 is placed in position over the open edges of said tanks and permanently fastened thereto by bolts 4 passing through the flanges thereof and the walls of said tanks. Solder is then applied to the seams and joints, forming an effectual seal against water and air.

A horizontal shaft 5 is supported near the top edge of said chest, in spaced relation to the rear wall thereof, by the transverse walls 6 and 7, which form bearings therefor. Said shaft 5 extends through the chest at one end thereof and terminates in a hand crank 8. Mounted within the chest, on opposite ends of said shaft are cams or eccentrics 9 and 9*a* and they are so fixed on the shaft that their centers lie on opposite sides of the axis thereof. These cams are provided with circumferential grooves 10 and 10*a* in which are loosely looped the heavy gauge wires 11 and 11*a*. A perforated pan 13 is adjustably suspended at its rear end from these wires by means of links 12 and 12*a*, said links being connected thereto at its rear edge by bolts passing through an upright flange 14 thereof. Near the front edge and on the underside of said pan a pivot member 15 is secured parallel to said front edge and rests on the bottom of the chest in bearings 15*a* and 15*b*, all for a purpose which will hereinafter be explained.

A unitary refrigerating coil unit B comprising a protective casing 16 in which is mounted the refrigerating coil 17 is placed in the chest A adjacent its rear wall and is retained in a vertical position therein by angle brackets 18 and 18*a* secured to the transverse walls 6 and 7, respectively, of the chest. Suitable openings 19 and 20 are provided near the top of the wall 7 so that coupling of the coil may be made with a compressor unit (not shown) for supplying a suitable refrigerant to said coil, thermostatic means 21 being provided to automatically control the operation of the compressor. The refrigerating element B is a compact structure, complete as a unit in itself and may be removed or replaced without any inconvenience or difficulty.

In the use of the apparatus, receptacles C,

containing milk or any other product which it is desired to cool and preserve, are placed in the chest A so that they rest on the bottom pan 13. The chest is then filled with water to a level slightly above the top of coil unit B. A drain pipe, 22, normally closed by a suitable plug, is provided at the bottom of one of the side walls to draw off the water when necessary. The lid 23 is then closed and the compressor, (not shown) is operated to supply the refrigerant to the coil 17, thereby cooling the liquid surrounding it. The hand crank 8 which may be operated manually, or mechanically by the provision of a pulley, belt and motor (not shown), is then rotated to actuate the cams 9 and 9*a*, which, by reason of the fact that their centers are on opposite sides of the shaft 5 impart an alternating reciprocating motion to the links 12 and 12*a*. This reciprocating motion is converted into a swaying or rocking motion in the pan 13 by reason of the fact that it is slightly flexible and that its front edge rests on the bottom of the chest so as to fulcrum on the member 15, the ends of the pan tipping in opposite directions.

The swaying or rocking motion of this pan in turn causes the containers C to sway or rock slightly, the end containers moving in opposite directions thus agitating the water in the chest A. The object of this is to cause said water to circulate more readily around the refrigerating coil and to diffuse more quickly the lower temperature thereof throughout the chest. The movement of the containers C keeps the liquid contained therein in motion and brings the warm milk from the center of the receptacle into contact with the sides thereof, thereby greatly shortening the time ordinarily required to cool such products. The tank may be adapted to receive one or more rows of containers.

In the modified form shown in Figures 4, 5 and 6 the apparatus comprises a chest A' in which is removably placed a refrigerating coil unit B'. This unit embodies a protective casing 16' to which the refrigerating coil 17' is secured, the casing being divided into compartments. Mounted on the top of the casing is a horizontal shaft 5' carrying adjacent its opposite ends, sheaves 9' and 9*a*' from which pans or racks 13', 13*a*' are suspended, one into each compartment. The centers of said sheaves lying on opposite sides of the shaft, it is obvious that by the rotation of the shaft the racks will be tipped and the respective containers moved in opposite directions to produce results similar to those described in connection with Figs. 1 to 3.

It is to be understood that various changes may be made in the construction of the apparatus without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. A milk chest comprising a tank adapted to receive a plurality of containers, a rack adjacent the bottom of the tank supporting said containers which rest with their bottoms thereon, and means operatively connected to the rack for tilting the same for imparting rocking motion to said containers.

2. A milk chest comprising a tank, a cooling medium within said tank, a rack adapted to support a plurality of containers, a pivot bearing on which the rack rests and means for rocking the rack on said bearing.

3. A milk chest comprising a tank adapted to receive a plurality of containers, means for cooling the contents of said containers, a rack for supporting the containers, and means for operating the rack to give the containers an up and down and a lateral movement.

4. In an apparatus for the cooling of liquid food products, a tank, a shaft supported therein, a rack movably supported within the tank at the lower part thereof, eccentric means fixed on said shaft and connections from said eccentric means extending down to said rack for imparting an up and down rocking motion to said rack to move containers resting on said rack up and down and laterally.

5. In an apparatus for the cooling and preserving of liquid food products an insulated tank, a horizontal shaft supported by the walls thereof, a flexible rack beneath the said shaft adapted to support a plurality of containers, a cooling medium within the tank and connection from said shaft to the rack for oscillating the ends of the rack in opposite directions.

6. In an apparatus for the cooling and preserving of liquid food products, an insulated tank a cover therefor, a refrigerating coil unit within said tank, a cooling medium surrounding said coil, rack means movably supported within the tank adapted to support a plurality of containers, and means for operating said rack means to cause containers to sway in opposite directions.

7. In an apparatus for the cooling of liquid food products, a tank, a shaft journalled within said tank, eccentrics mounted on said shaft, at opposite ends thereof, a rack movably supported beneath the shaft, links connected to said rack and having strap portions engaging the eccentrics, and means for rotating the shaft.

8. In an apparatus for the cooling of liquid food products, an insulated tank, a shaft journalled in the transverse walls thereof, cams eccentrically mounted on said shaft at opposite ends thereof, circumferential grooves in said cams, links loosely secured in said grooves, a rack pivotally mounted in the tank and connected with said links, and means for rotating said shaft.

9. In an apparatus of the class described,

an insulated tank, a shaft supported in the transverse walls thereof, cams eccentrically mounted on said shaft at opposite ends thereof, the centers of said cams lying on opposite sides of said shaft, a flexible rack movably supported in the tank and means connecting opposite ends of said shaft with said eccentrics.

10. In an apparatus of the class described, a tank, a flexible rack therein for supporting liquid containers, and means for imparting a twisting movement to said rack.

11. In an apparatus of the class described, a tank for holding a cooling liquid, supporting means for food containers, and means for operating said supporting means to move containers simultaneously in opposite directions.

12. In an apparatus of the class described, a liquid containing tank, a refrigerating coil unit therein, said unit comprising a protective casing having a plurality of inter-communicating compartments, a coil secured to said casing, said coil encircling said compartments, racks pivotally supported in said compartments, and means for rocking said racks in respectively opposite directions.

13. In an apparatus for the cooling and preserving of liquid food products, an insulated liquid containing tank, a refrigerating unit within said tank, a horizontal shaft supported by said unit, racks pivoted within the tank to support each a plurality of containers, and means connecting said shaft with said racks for rocking them in respectively different directions.

14. In apparatus for cooling food products, a tank containing a cooling medium, a support for a container for holding the food product, said support receiving the container which rests with its lower end thereupon, and means for oscillating the support to give up and down and a lateral movement to the container, said container being partly submerged in the cooling medium, whereby said cooling medium is agitated, substantially as described.

In testimony whereof, I affix my signature.

SAMUEL DANIELS.