No. 659,375. Patented Oct. 9, 1900.

J. A. MYERS.

MILK COOLING APPARATUS.

(Application filed July 23, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

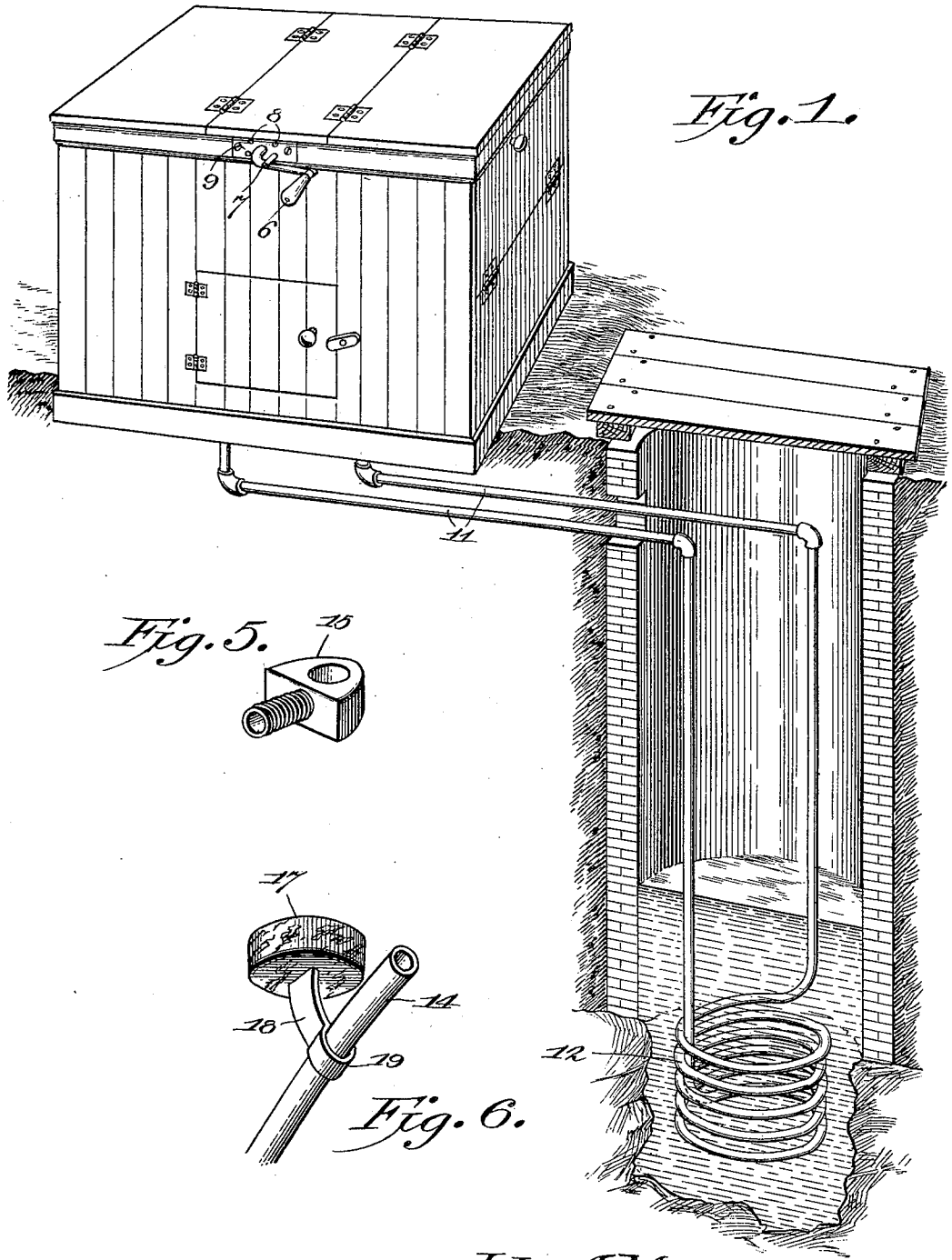


Fig. 5.

Fig. 6.

Witnesses
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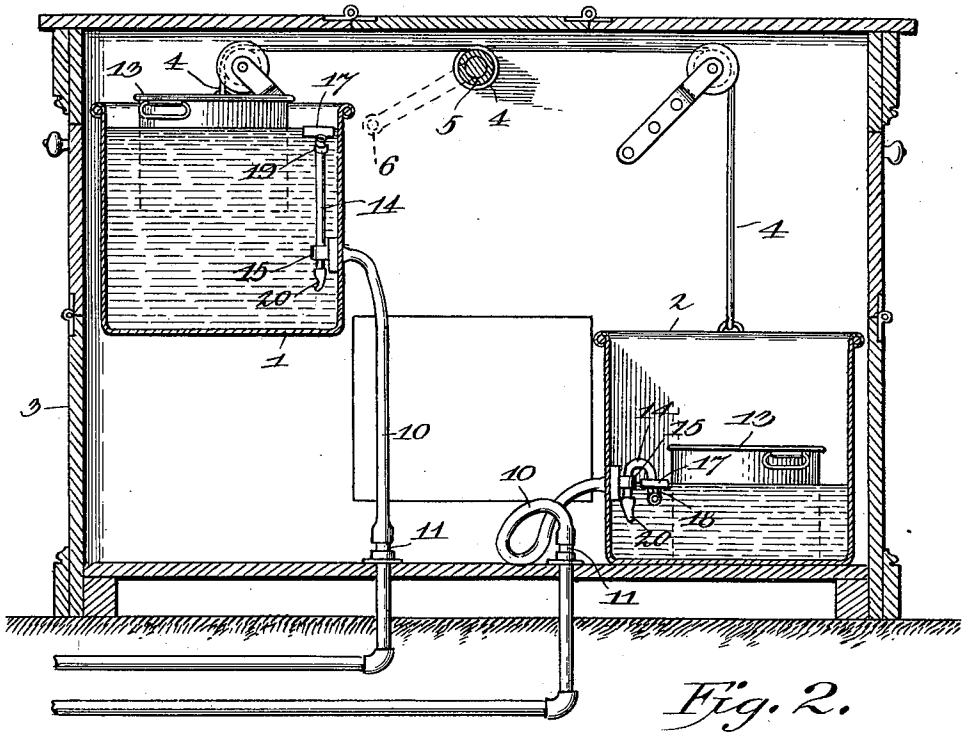


Fig. 2.

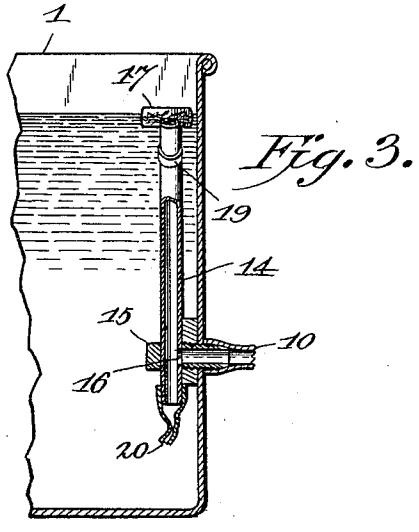


Fig. 3.

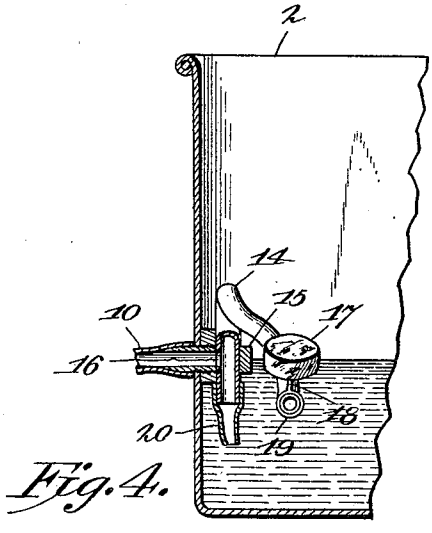


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN ADDISON MYERS, OF NORTH ENGLISH, IOWA.

MILK-COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 659,375, dated October 9, 1900.

Application filed July 23, 1900. Serial No. 24,554. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADDISON MYERS, a citizen of the United States, residing at North English, in the county of Iowa and State of Iowa, have invented a new and useful Milk-Cooling Apparatus, of which the following is a specification.

The invention relates to improvements in milk-cooling apparatus.

One object of the present invention is to improve the construction of apparatus for cooling milk, more especially that shown and described in Patent No. 508,146, granted to me November 7, 1893, and to obviate the necessity of pumping the water to secure the circulation thereof. A further object of the invention is to provide an apparatus of this character adapted to cause a circulation of water by a slight adjustment of the parts and to cause the water in leaving a tank to escape from the surface, so that the warmer or surface water will be drawn off first and the cooler water will remain.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a milk-cooling apparatus constructed in accordance with this invention, the well or cistern being shown in section to illustrate the arrangement of the cooling-coils. Fig. 2 is a vertical sectional view of the refrigerator-casing. Figs. 3 and 4 are enlarged detail sectional views illustrating the construction of the flexible tube of the tank. Fig. 5 is a detail view of the coupling. Fig. 6 is a detail view illustrating the arrangement of the float of the flexible tube.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 and 2 designate vertically-movable tanks, arranged within a refrigerator-casing 3 and connected at each end by a rope or cable 4 or other flexible connection centrally coiled around a shaft or windlass 5, which is provided with an exterior crank-handle 6, by means of which the shaft or windlass is rotated to raise and lower the tanks. The tanks are adapted to move alternately in opposite directions, and they are connected, as hereinafter explained, by pipes or tubes, and when it is desired to produce a circulation of water the full tank is raised to the position illustrated in Fig. 2 of the accompanying drawings, whereby the water will be caused to flow through the pipes or tubes, hereinafter explained, from the upper tank to the lower one, which operation will fill the lower tank with cool water. The crank-handle is engaged by a removable pin or key 7; but any other suitable locking device may be employed for holding the windlass against movement in either direction for locking either of the tanks in an elevated position. The perforations 8 for the reception of the pin or key 7 are formed in a bearing-plate 9, arranged at the front of the casing, as clearly illustrated in Fig. 1 of the accompanying drawings.

The tanks are connected by exterior flexible tubes 10 with pipes 11, preferably constructed of metal and extending through the bottom of the casing and connected at their lower terminals by a coil 12, which may be of any length and which is designed to be located in a well or cistern, as clearly illustrated in Fig. 1 of the accompanying drawings, so that the water in the coils will have its temperature reduced. The pipes 11 may be arranged in any suitable manner to suit the location of the casing 3 relative to the well, cistern, or other means for cooling the coil. The flexible tubes 10 are connected with the inner sides of the tanks at a point above the bottom, so that when the water is allowed to escape from the upper tank a predetermined quantity will remain therein, so that neither tank will ever be dry; but the flexible tubes may be connected at the bottoms of the tanks or at any other point, and it will be apparent that the circulation of water from one tank to the other reduces its temperature and that the tanks are supplied with cool water without diminishing the quantity in the well or cistern and without the labor of pumping. The casing 3 may be constructed in any suitable manner and is designed to be provided with suitable doors, as shown, and its capacity is such that it may be employed for cooling things other than milk. The milk is designed to be arranged within receptacles 13 of less depth

than the tanks and are designed to remain open and to float, so that the greater portions of the receptacles will remain submerged at all times, as illustrated in Fig. 2 of the accompanying drawings. The milk receptacles or cans 13 will be of a size corresponding to the distance of the upper ends of the tubes 10 from the bottoms of the tanks, and the desired depth of water within the tanks may be controlled by positioning the upper ends of the flexible exterior tubes 10. As the water begins to flow into the bottom tank the receptacle 13 will rise and float, so that its position relative to the surface of the water remains unchanged.

In order to take off the surface water of the uppermost tank, so that the warm water will run off first and the cooler water remain longer in the tank, a flexible inner tube 14 is provided and is connected near one end with the outer or exterior tube 10 by an approximately T-shaped coupling 15, which extends through the inner wall of the tank, forming an exterior nipple, as clearly shown in Figs. 3 and 4. The interior flexible tube is provided near its lower end with an aperture 16, registering with the horizontal outwardly-extending portion of the T-shaped coupling, and the upper portion of the flexible tube is connected with a float 17, which is adapted to support the upper end of the inner flexible tube 14 at the surface of the water, so that the surface water will flow through the flexible tube. The float may be constructed in any suitable manner, and it is preferably provided at its bottom with a depending arm 18, having an eye or ring 19, through which the flexible tube is drawn and which permits the flexible tube 14 to be readily adjusted, so that its upper end will be in proper position to receive the surface water.

The lower end of the inner flexible tube extends beyond the T-shaped coupling and is provided with an outwardly-opening valve 20, which may be constructed in any suitable manner, but which preferably consists of a short highly-flexible tube having one end stretched over the lower end of the tube 14. This short flexible valve-tube is adapted to collapse around the lower end of the tube 14 and prevent water from flowing into the same at this point; but when water is flowing into the tank the valve-tube will open automatically and permit such water to be delivered to the tank at the bottom thereof.

It will be seen that the milk-cooling apparatus is exceedingly simple and inexpensive in construction and that a circulation of water may be effected by altering the position of the tanks with relation to each other and changing the full tank from the bottom to the top. Also it will be clear that all pumping is obviated and the quantity of water within the well or cistern is not diminished. It will also be apparent that the position of the milk-receptacles relative to the surface of the water within the tanks is unaffected by the change in the position of the tanks. Furthermore, it will be clear that if the connection between the flexible exterior tube 10 and the tanks is made at the bottom of the latter the upper tank will be completely emptied, and I desire it to be understood that various changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. An apparatus of the class described comprising the tanks adapted to be raised and lowered to change their relative position, said tanks being adapted to contain a liquid, pipes or tubes connecting the tanks, and means for raising and lowering the tanks, substantially as described.

2. An apparatus of the class described comprising the tanks, pipes or tubes connecting the tanks, and a shaft or windlass having flexible connections extending to the tanks and adapted to alternately raise and lower the same when the shaft or windlass is rotated, substantially as described.

3. An apparatus of the class described comprising the tanks adapted to contain a liquid and capable of being raised and lowered to change their relative position, the pipes or tubes connected with the tanks at a point above the bottom thereof, whereby a given quantity of the liquid is caused to remain in the tanks, receptacles arranged within the tanks and adapted to contain the substance to be cooled, and arranged to float on the surface of the liquid and means for raising and lowering the tanks independently of each other, substantially as and for the purpose described.

4. An apparatus of the class described comprising the tanks capable of vertical movement and adapted to contain a liquid, the pipes 11 connected with the tanks and provided at their lower ends with a connecting-coil designed to be arranged in a well or cistern, and means for raising and lowering the tanks, independently of each other, substantially as described.

5. An apparatus of the class described comprising the tanks adapted to be raised and lowered to change their relative position and designed to contain a liquid, means for raising and lowering the tanks independently of each other, connections between the tanks to permit the liquid to flow from one to the other, and means for cooling the said connections at a point remote from the tanks, substantially as described.

6. An apparatus of the class described comprising the tanks adapted to be raised and lowered and designed to contain a liquid, means for raising and lowering the tanks independently of each other, connections between the tanks to permit the liquid to flow from one to the other, and a flexible tube communicating with the said connections and provided

with a float, whereby it is adapted to deliver the surface water to the said connections, substantially as and for the purpose described.

7. An apparatus of the class described comprising the tanks adapted to be raised and lowered and designed to contain a liquid, means for raising and lowering the tanks independently of each other, connections between the tanks to permit the liquid to flow from one to the other, a flexible tube extending from the said connection and provided with a float adapted to hold it in position to cause the surface water to flow through the said connection, and an outwardly-opening valve arranged at the terminal of the said connections, whereby the liquid will be delivered to the tank at the bottom thereof, substantially as described.

8. An apparatus of the class described comprising a casing, tanks located within the casing and adapted to be raised and lowered, pipes or tubes connecting the tanks and designed to extend into a well, cistern or the like, and means for raising and lowering the tanks independently of each other substantially as described.

9. An apparatus of the class described comprising the tanks, means for raising and lowering the tanks independently of each other, the pipes 11, designed to extend to suitable cooling means, the exterior flexible tubes 10, extending from the pipes 11 to the tanks, and the interior flexible tubes provided with floats and having outwardly-opening valves at their lower ends, substantially as described.

10. In an apparatus of the class described, the combination with a tank, of a tube or pipe connected with the tank and forming a conduit for conveying a liquid to and from the same, a flexible tube arranged within the tank and connected at one end with the said tube or pipe and provided at its other end with means for supporting it at the surface of the liquid within the tank, and an outwardly-opening valve also connected with the tube or pipe and consisting of a flexible tube, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN ADDISON MYERS.

Witnesses:

JOHN E. GILL,

JAS. A. MILLER.