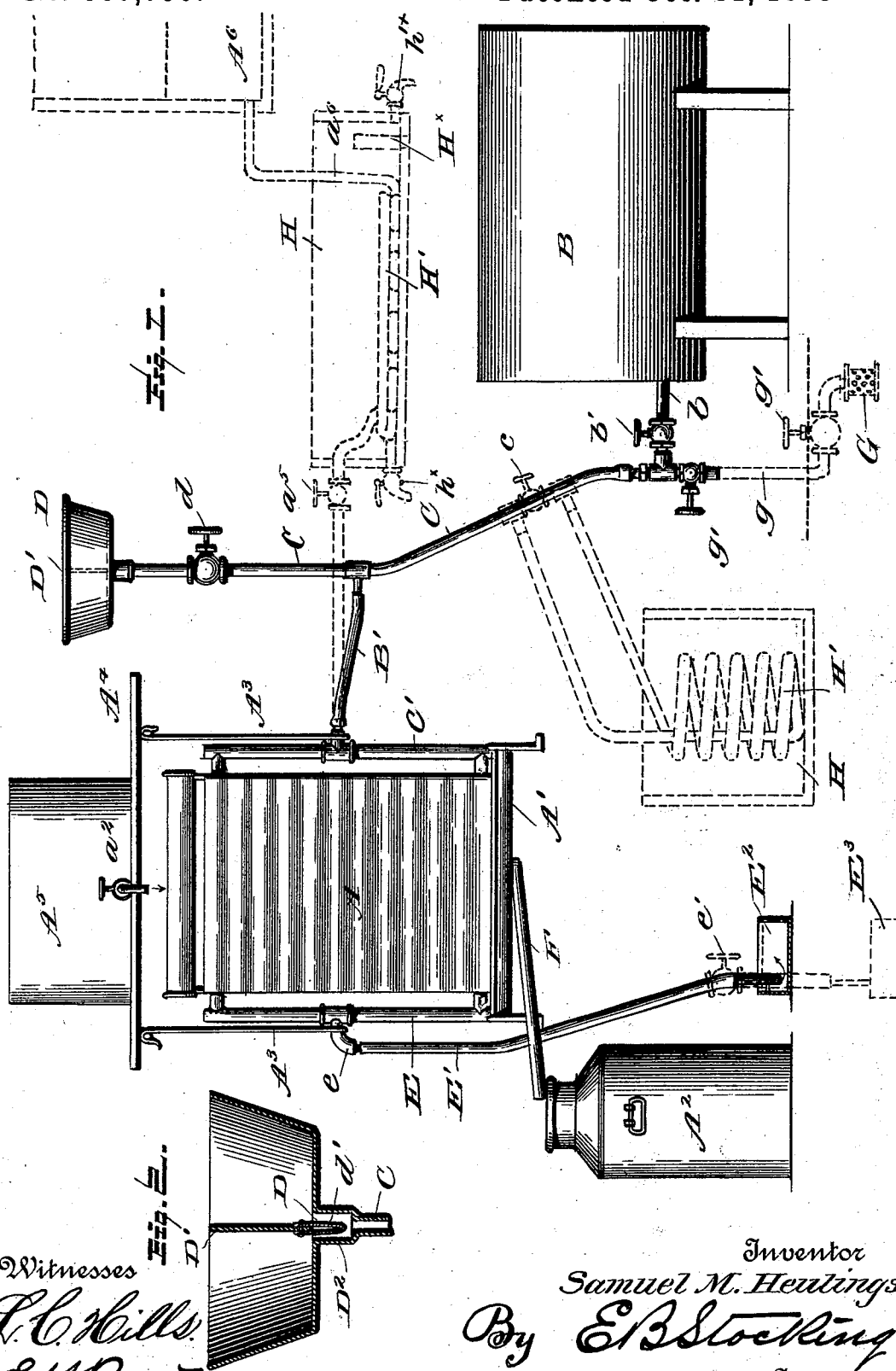


S. M. HEULINGS.
MILK COOLING APPARATUS.

Patented Oct. 31, 1893.



Witnesses
L. C. Hills
E. A. Bond

Inventor
Samuel M. Heulings
E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

SAMUEL M. HEULINGS, OF HADDONFIELD, NEW JERSEY, ASSIGNOR TO THE
STAR MILK COOLER COMPANY, OF SAME PLACE.

MILK-COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 507,730, dated October 31, 1893.

Application filed November 4, 1892. Serial No. 450,966. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. HEULINGS, a citizen of the United States, residing at Haddonfield, in the county of Camden, State of New Jersey, have invented certain new and useful Improvements in Milk-Cooling Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in milk cooling apparatus and it has for its objects among others, to provide a simple and compact apparatus and arrangement of parts whereby the water or other cooling liquid may be readily siphoned from a spring, tank, or other source of supply and in which a refrigerant cooling device may be introduced when required to cool the liquid before it passes to the milk cooler.

It has for a further object to prevent the drawing in of air with the liquid. In order to start the device operating, I first exhaust the air by any suitable means and then admit the water from the spring, tank, or other supply when the apparatus will continue to be self-operating.

Any form of milk cooler may be employed in connection with the present improvement. Other objects and advantages of the invention will appear in the following description and the novel features thereof will be particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification and in which—

Figure 1 is a side elevation of my improved apparatus, showing, in dotted lines, some of the modifications which may be adopted. Fig. 2 is an enlarged central, vertical section of the starting cup or receptacle.

Like letters refer to like parts in both views.

Referring now to the details of the drawings by letter A designates a milk cooler which may be of any suitable construction and supported in any desired manner. The cooler may be located in any desired position relatively to the water supply but preferably below the same so as to avoid the necessity of

first pumping the liquid to a point above the cooler and then allowing it to flow by gravity. The cooler may be arranged at any required distance from the source of liquid supply and the refrigerant cooler may be interposed at any suitable point. In the present application I have illustrated two forms of apparatus wherein the refrigerant cooler is interposed.

Referring to Fig. 1, B is a tank or other receptacle provided with an outlet pipe *b* having a suitable controlling valve *b'* and connection with a pipe C which may be flexible or rigid as desired. This pipe C has a branch B' which communicates with the pipe C' upon one side of the cooler and which communicates with the cooler at top and bottom as shown. The pipe C near or at its upper end carries the cup or receptacle D and between the said cup or receptacle and the branch B' it is provided with a suitable valve as *d*. In order to prevent air entering the pipe C with the water from receptacle D which would occur were the discharge opening in said receptacle of ordinary form I place within said receptacle a vertical partition D' suitably held therein and provided with a depending portion *d'* which extends into the enlargement D² (which, however, need not be present) at the bottom of the said receptacle as seen clearly in Fig. 2, providing a passage way upon each side thereof as seen in said figure and which serves to prevent a circular movement of the water in passing through the discharge opening of said receptacle and thereby preventing air from flowing into the pipe with the water.

E is a pipe upon the opposite side of and communicating with the cooler A at top and bottom as shown and near its center provided with a branch *e* with which is connected the pipe E' which is provided with a suitable seal to prevent ingress of air and which seal may be of any desired or well known form. It may be located at any desired point either as shown at E² in full lines or at E³ by dotted lines in Fig. 1. A valve *e'* may sometimes be employed in place of the seal as indicated by dotted lines in Fig. 1.

F is a discharge pipe from the trough A' of

the cooler and through which the milk may be conducted to a can or other receptacle A² as shown in Fig. 1.

The cooler may be supported by hangers or loops A³ as seen in Fig. 1 and upon the support A⁴ may be arranged the receptacle A⁵ through the discharge pipe a² of which the milk flows onto the cooler as indicated in Fig. 1.

The operation of this form of apparatus is as follows: The cock or valve b' being closed and the receptacle B filled with water or water being supplied thereto, the valve d is opened when the water flows from the receptacle D through the pipe C and through the branch B' and into the pipe C' and cooler, forcing all of the air therefrom and when the water emerges from the pipe E' the valve d is closed and the valve b' opened when the water will be drawn from the tank or receptacle B by siphonage. Instead of taking the water from a tank or receptacle it may be taken from a spring as indicated by dotted lines in Fig. 1, a suitable strainer G being generally provided and the pipe g from said spring communicating with the pipe C and provided with a suitable valve g' which may be located at any desired point, either as shown by full lines or by dotted lines in Fig. 1. Or connection may be had with both the tank and the spring as shown, it being understood of course that generally when one form is employed the outlet from the other will be closed although sometimes both may be used together.

It may sometimes be desirable to arrange the tank or receptacle upon a higher plane than the cooler and conduct the water therefrom by gravity; such an arrangement is shown by dotted lines at the right of Fig. 1 in which A⁶ designates the tank and a⁶ the outlet pipe therefrom which is designed to connect with the pipe C' of the cooler at the point where the branch B' connects in the form shown by full lines. The pipe should be provided with a suitable valve a⁵ as shown whereby the supply may be controlled.

If it is desired to cool the liquid intermediate of the tank and the cooler A, it may be done in this manner: A suitable tank H should be provided in which is located a coil H' in the supply pipe and in which tank is designed to be placed any suitable refrigerant. In the form shown at the right and upper part of Fig. 1, this coil is simply a coil formed of the pipe A⁶ but in the form shown at the lower and central part of said figure the coil is formed of an independent pipe from the pipe C and having its ends connected with and communicating with said pipe C, a suitable valve c being provided as shown whereby the water in its passage from the tank or from

the spring or other source is caused to pass down one branch of the coiled pipe and through the coil in the refrigerant receptacle, thence through the other branch and through the pipe C and branch B' to the cooler. It will be readily seen that by this interposition of the cooling device the liquid may be sent on its direct course from tank B to pipe C' or by way of said coil and pipe H' to the pipe C'.

Modifications in detail may be resorted to without departing from or sacrificing any of the advantages of the invention.

Any suitable form of coil may be employed, but in some cases I prefer the form shown by dotted lines in Fig. 1, in which a shallow vat or tank is shown and in this tank or vat is arranged one or more layers of pipe connected one with the other by return bend, and H^x is an overflow pipe from the tank or vat. h^x is a drip cock from the pipes and h'^x a drip cock from the tank or vat. By this means I obtain better results; I place enough water in the tank or vat to just cover the pipes and place thereon a layer of crushed ice; the ice cannot be melted away from a close position or contact with the pipes as it is constantly settling on them; the overflow pipe H^x admits of the automatic discharge of the surplus water as it is formed in the tank. The drip cocks allow of the draining of the pipes or vat when desired.

What I claim as new is—

1. The combination with the milk cooler, a liquid supply and connections between the same, of means for preventing ingress of air to the cooler, with the supply and a liquid cooling device, interposed between the cooler and supply substantially as described.

2. The combination with a milk cooler, a liquid supply and connections between the same of an interposed liquid cooling device with means for throwing it into or out of operative connection, as set forth.

3. The combination with a milk cooler, a liquid supply and siphon connections, of an interposed liquid cooling device and means for preventing ingress of air to the cooler with the supply, as set forth.

4. The combination with a milk cooler, a liquid supply and siphon connections between the same, of means for preventing ingress of air to the cooler and an interposed liquid cooling device with means for throwing it into or out of operative connection, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL M. HEULINGS.

Witnesses:

G. H. MOORE,
RAY NIXON.