

(No Model.)

2 Sheets—Sheet 1.

F. S. HARTZELL.

MILK COOLER.

No. 304,818.

Fig. 1. Patented Sept. 9, 1884.

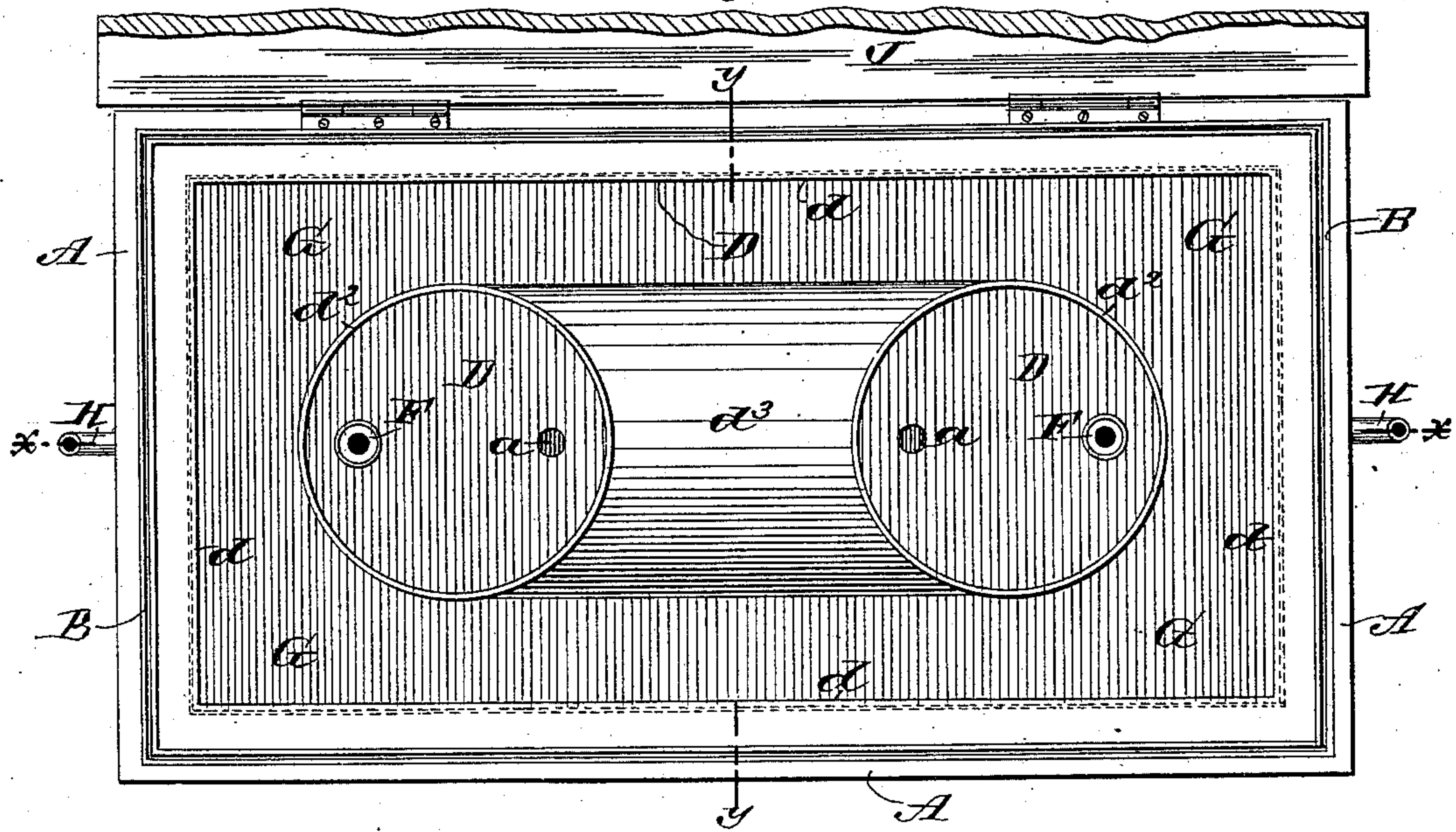
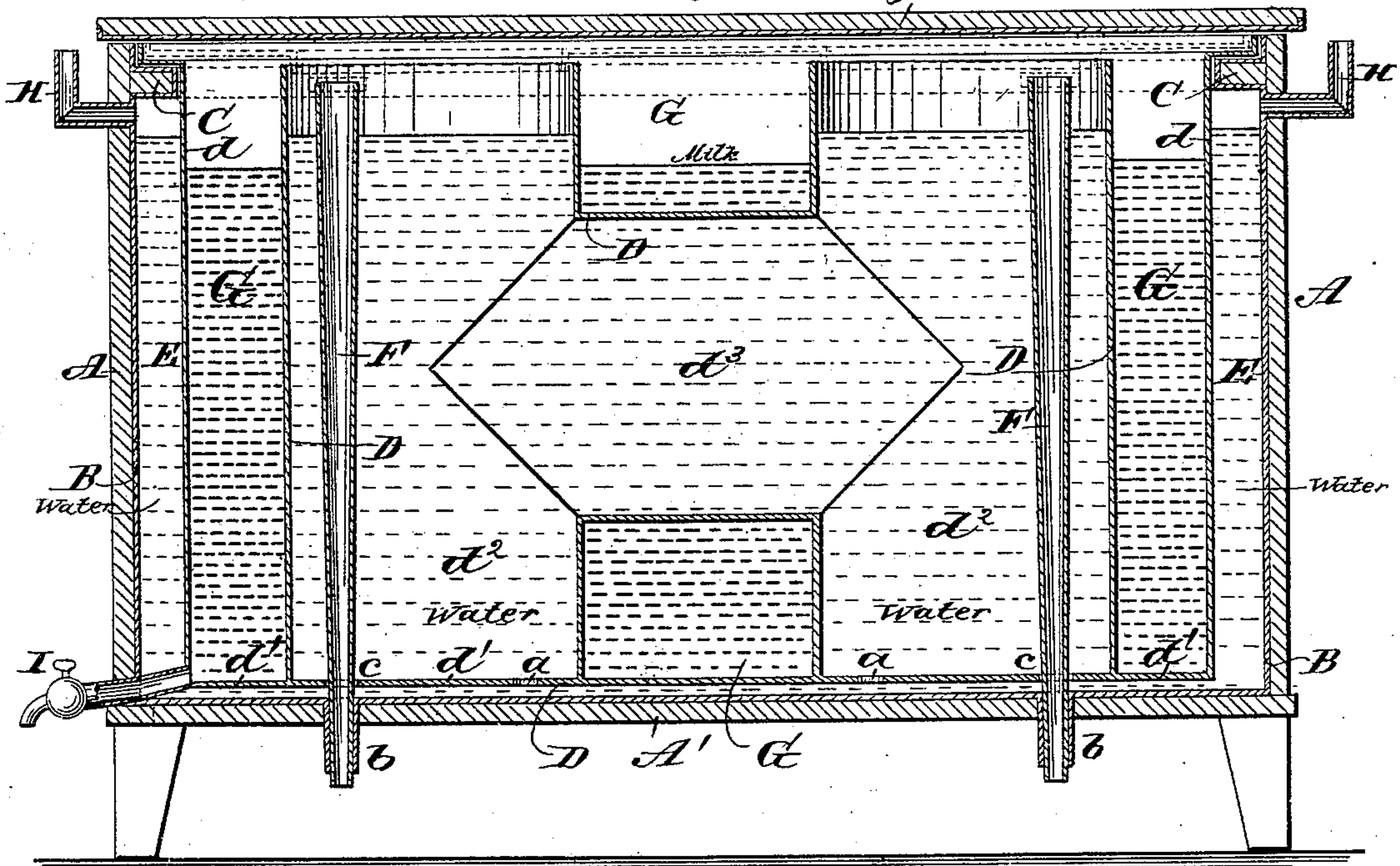


Fig. 2.



WITNESSES:

*Wm Beyer*  
*C. Sedgwick*

INVENTOR:

*F. S. Hartzell*  
BY *Munn & Co*  
ATTORNEYS.

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Fig. 3.

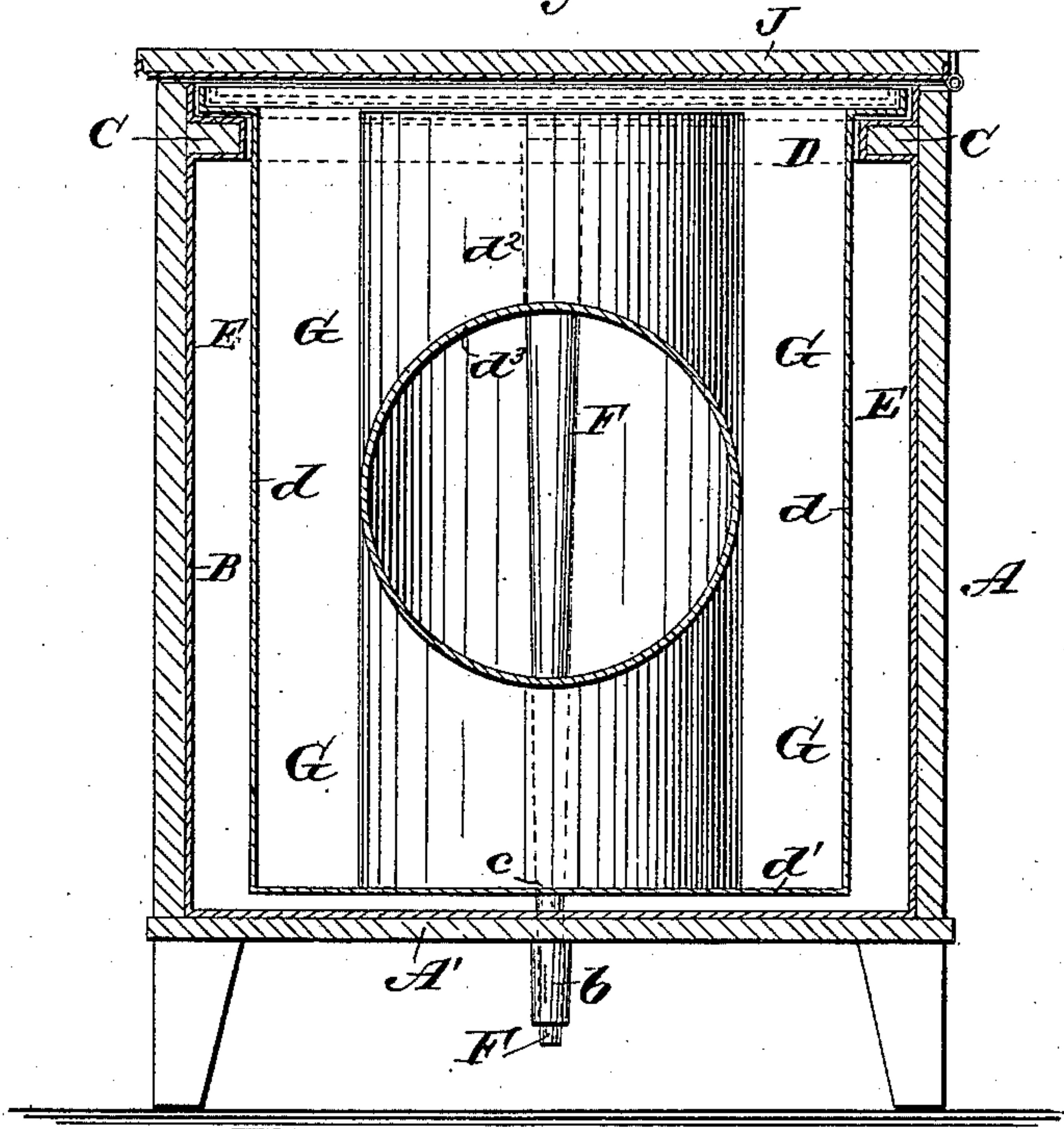
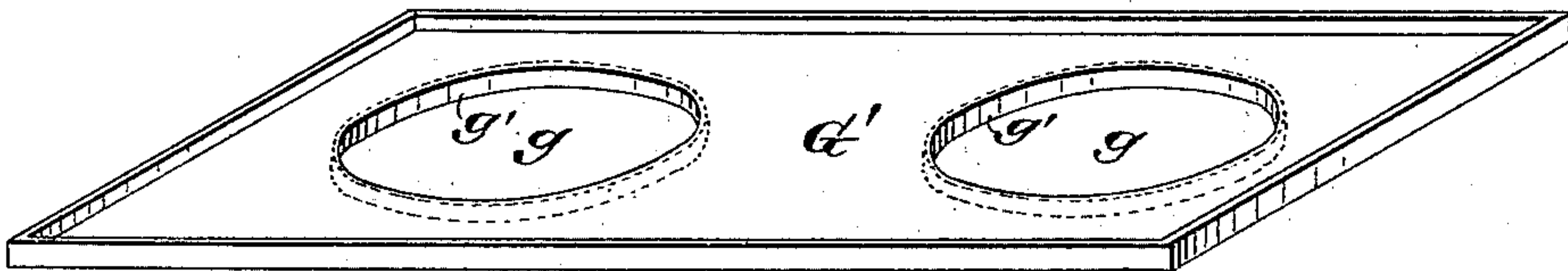


Fig. 4.



WITNESSES:

*W. Beyer*  
*C. Sedgwick*

INVENTOR:

*F. S. Hartzell*  
BY *Munn & Co*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

FRANCIS S. HARTZELL, OF BEAN, PENNSYLVANIA.

## MILK-COOLER.

SPECIFICATION forming part of Letters Patent No. 304,818, dated September 9, 1884.

Application filed February 7, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS S. HARTZELL, of Bean, Bucks county, Pennsylvania, have invented a new and Improved Milk-Cooler, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my new and improved milk-cooler, the cover being shown open and broken partly away. Fig. 2 is a sectional elevation of the milk-cooler on line  $x x$ , Fig. 1. Fig. 3 is a transverse sectional elevation on line  $y y$ , Fig. 1; and Fig. 4 is a perspective view of the plate used in filling the water-compartments with ice, for preventing small pieces of ice from falling into the milk-compartments.

The object of this invention is to cool milk rapidly and uniformly throughout the mass of milk, for the purpose of raising cream in the shortest space of time.

Referring to the drawings, A represents a box or tank, made, by preference, of wood and lined with the metallic lining B. Near its upper edge the casing A is provided upon the inside with the cleat C, which supports within the casing A the inner metallic tank or portion, D, which comprises the outer walls,  $d$ , bottom  $d'$ , vertical water-chambers  $d^2 d^2$ , and horizontal water-connecting tube  $d^3$ , which connects the vertical water-chambers  $d^2 d^2$ , and is of about equal diameter therewith. The space E between the outer surface of the walls  $d$  and the lining B is the outer water-space, which surrounds the whole inner metallic portion, D—that is, at the sides and bottom—and this space E communicates with the inner water-chambers,  $d^2 d^2 d^3$ , through the apertures  $a a$ , made through the bottom  $d'$ , so that water admitted to either of the chambers  $d^2$ , or to the space E, will find its way to all of the connected water-spaces, and will stand on the same level in all of them, as illustrated in Fig. 2. The lining B is provided with the tubes  $b b$ , which reach through suitable openings made in the bottom A' of the outer wooden casing, A. The bottom  $d'$  of the metallic portion D has made through it, within the

chambers  $d^2 d^2$ , the openings  $c c$ , which stand immediately above the tubes  $b b$ , and in these openings  $c c$  and tubes  $b b$  are placed the conical overflow-pipes F F, which close the tubes  $b b$  water-tight, and reach at their upper ends nearly to the tops of the chambers  $d^2 d^2$ , and serve to convey away the water from the cooler and prevent all danger of overflow. The space G between the wall  $d$  and the outer surfaces of the inner water-chambers,  $d^2 d^2$  and  $d^3$ , is the space into which the milk to be cooled is poured, so that when the cooling medium is admitted to the water-spaces the body of the milk will not only be surrounded by water, but the milk itself will surround a large portion of the cooling medium. When ice is used in cooling, it will be introduced into the upper open ends of the vertical chambers  $d^2 d^2$ ; and to obviate all danger of dropping ice into the milk I provide the removable plate G', which, when in place, completely covers the small space, but is formed with the openings  $g g$ , which coincide with the upper open ends of the chambers  $d^2 d^2$ , and these openings  $g g$  are surrounded by the flanges  $g' g'$ , which fit within the upper ends of the said chambers  $d^2 d^2$ , as shown in dotted lines in Fig. 2, thus permitting the introduction of the ice into the chambers  $d^2 d^2$  without the possibility of disturbing the milk. The water may be introduced into the cooler through either of the pipes H H, and the milk may be drawn from the cooler through the faucet I. (Shown in Fig. 2.) The milk and water having been introduced into the cooler, the plate G' will be removed and the lid J closed, which protects the milk from atmospheric influence while the cream is rising.

Constructed in the manner described, it will be seen that the water-spaces furnish a very large cooling-surface, and that the chamber  $d^3$ , when the can is filled with milk, cools the center of the body of milk and prevents its souring, and causes also the contents of the can to be uniformly cooled, which is a desideratum to the full and perfect rising of the cream, and this uniform cooling is augmented by the connecting of the chambers  $d^2 d^2$  by the large central chamber,  $d^3$ , for by this arrangement, when ice is placed in one chamber  $d^2$ , the temperature will be correspondingly lowered in the



other, and the milk-space being placed in a water-tank, the lower part of the body of milk being cooled from the water in the surrounding tank, and the horizontal space  $d^3$  is located just where all the cooling surface is utilized to the best advantage.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the outer tank, A, of the inner metallic tank, D, formed with the chambers  $d^2$   $d^2$ , connected by the horizontal chamber  $d^3$ , the chambers  $d^2$  communicating with the water-space E through the openings  $a$ , substantially as and for the purposes set forth.

2. In a milk-cooler, the combination, with the outer tank, A, of the inner receptacle, D, having the chambers  $d^2$   $d^2$ , connected by the intermediate horizontal chamber,  $d^3$ , the chambers  $d^2$  having water-openings  $a$  in their bottoms, said receptacle D also having the outer wall,  $d$ , and bottom  $d'$ , providing a milk-chamber, G, substantially as and for the purpose set forth.

FRANCIS S. HARTZELL.

Witnesses:

JOHN B. BEAN,  
JOHN HOLLY.