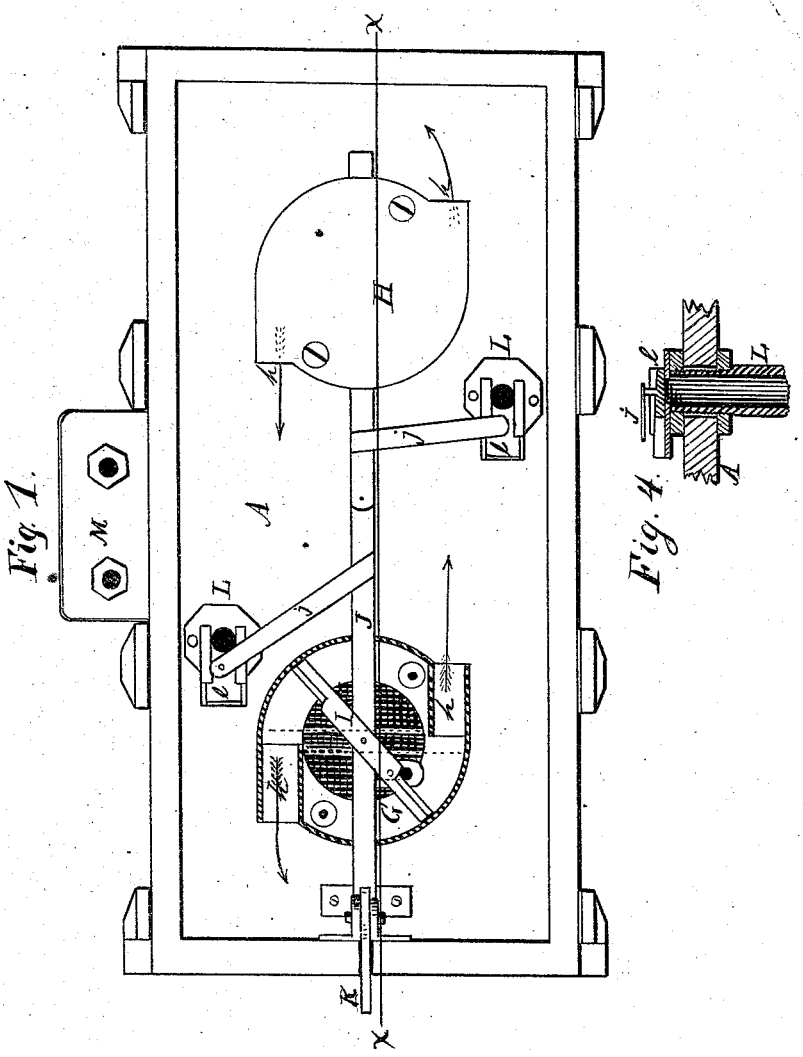
2 Sheets--Sheet 1.

L. A. SUNDERLAND.

Heater for Cheese-Vats.

No. 161,176. Patented March 23, 1875.



Witnesses.

Geo. W. Tibbitts

Frank R. Tibbitts

Inventor.

Lewis A. Sunderland

2 Sheets--Sheet 2.

L. A. SUNDERLAND.

Heater for Cheese-Vats

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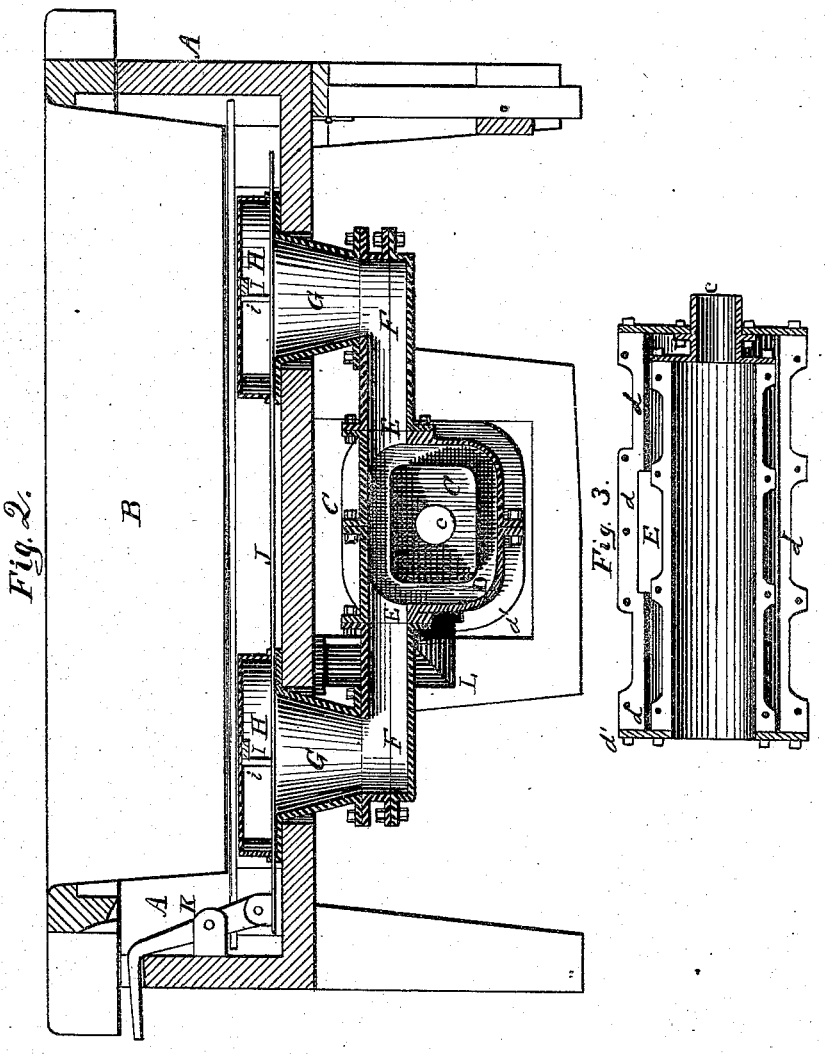

Witness.

Geo. W. Gibbitt

Frank R. Gibbitt

Inventor.

Lucius A. Sunderland

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UNITED STATES PATENT OFFICE.

LUCIUS A. SUNDERLAND, OF MADISON, OHIO.

IMPROVEMENT IN HEATERS FOR CHEESE-VATS.

Specification forming part of Letters Patent No. **161,176**, dated March 23, 1875; application filed August 12, 1874.

To all whom it may concern:

Be it known that I, LUCIUS A. SUNDERLAND, of Madison, in the county of Lake and State of Ohio, have invented Improvements in Heaters for Cheese-Vats, of which the following is a specification:

This invention relates to certain improvements in heaters for cheese-vats; and consists in cheese-vats having a heating apparatus, the heat from which is conveyed through pipes, provided with regulating-valves, to the milk-pans or heating-box, and the condensed steam returned to the heater, when constructed as hereinafter more fully specified.

To enable others to fully understand my improvements, I will proceed to describe the same in detail by the aid of the accompanying drawings, in which—

Figure 1, Sheet 1, is a plan view with milk-vat removed. Fig. 2, Sheet 2, is a longitudinal section in line *x x* of Fig. 1. Fig. 3, Sheet 2, is a detached sectional view of heater-cylinders, showing manner of putting the cylinders together, and attaching the heads. Fig. 4, Sheet 1, is a detached sectional view of valve on return pipe.

A, Figs. 1 and 2, is the main box of the vat, supported upon suitable legs. B, Fig. 2, is the milk-vat, which sets within the box A, and is removable. C is a heater, situated beneath the box A. The heater consists of two cylinders or shells, C and D. The inner one, C, forms the fire-box, and D the outer one, forming a water-space surrounding the fire-box. The outer cylinder, D, is cast in two parts, having flanges *d d* by which the parts are bolted together to form the complete outside cylinder. The said parts also have flanges *d'* at the ends, by means of which the heads are secured by bolts. The inner cylinder, C C, is also cast in two parts, and bolted together in like manner to the cylinder D. The rear end of cylinder C is closed with a head having a collar, *c*, which passes out through the head of the outer cylinder, D, to which a smoke-pipe is to be attached. The said collar also has an annular flange encircling it, by which the collar is fastened to the head by bolts. To the upper side of the cylinder C are cast wide collars E E, at each side provided with flanges, to which are secured flat pipes F F, leading to the right and left, for connecting the water-space in cylinder D with the box A. The pipes F F are made narrower toward their ends, where are attached tapering or flaring connections G G, secured by flanges and bolts. These connections pass through openings in the bottom of the box larger than their own circumference, and their top flanges are made wide, for the purpose of protecting the wood, and preventing the water coming in contact with the ends of the timber, to prevent the wood from becoming saturated, causing it to rot in a short time. Their flaring shape also aids to spread or distribute the heat. Over the said connections G G are placed caps or valve-chambers H H, having tangent openings *h h* for conducting the heated water into the box A, which are closed by valves *i i* on the ends of arms I, pivoted at their center to the top of the chambers. One of the objects of the said caps is to prevent the column of hot water rising suddenly against the bottom of the vat B, and to aid in spreading the heat. The valve-arms I are operated by means of a sliding bar, J, running through the said chambers, and lengthwise of the box A near to its bottom, one end of the said bar J being connected to a lever, K, pivoted at one end of the said box, by which it is operated. The bar J has short slotted arms attached to it underneath the valve-arms I, in which a pin on the under side of said arms plays for turning them to open and close the valves, as seen in dotted line, Fig. 1. L L are return pipes, by which the water flows back into the heater. They are provided with valve *l l*, operated by arms *j j* on the bar J. Said valves are made in form of sliding gates fitted in grooves in the upper side of a cap screwed onto the end of the pipe, seen in section, Fig. 4.

It will be seen that these valves are opened and closed in concert with the valves *i i*, so that the circulation of water is regulated by means of the valve-operating mechanism described.

At one side of the box A is attached a water-supply reservoir, M, connected by two pipes to the heater.

The result of this construction and arrangement is that the heat is equally conducted through the system of pipes, chambers, and

valves throughout the space underneath the milk-vat, the water passing in currents, as indicated by the arrows, so that all parts are of equal temperature, which is easily and readily regulated by the valve-mechanism.

Having described my invention, I claim as follows—

1. The combination, with caps H, having openings *h h* of the valves *i i*, constructed and operating substantially as and for the purpose described.

2. The combination of the sliding bar J, and its operating mechanism, with the valve-arms I, carrying valves *i i*, and caps H, substantially as and for the purpose described.

3. The combination of the arms I, carrying valves *i i*, the sliding bar J, valves *l l* on the return pipes, arms *j j*, and lever K, substantially as and for the purpose described.

4. The tapering pipes or connections G G, combined with the heating apparatus of a cheese-vat, and constructed and arranged substantially as described.

5. In a heater for cheese-vats, the caps or chambers H, having tangent openings *h h*, in combination with the connections G G, as shown and described, for the purpose set forth.

LUCIUS A. SUNDERLAND.

Witnesses:
GEO. W. TIBBITTS,
M. ROGERS.