J. G. C. LEE.

Lard-Cooler.

No. 169,180. Patented Oct. 26, 1875.

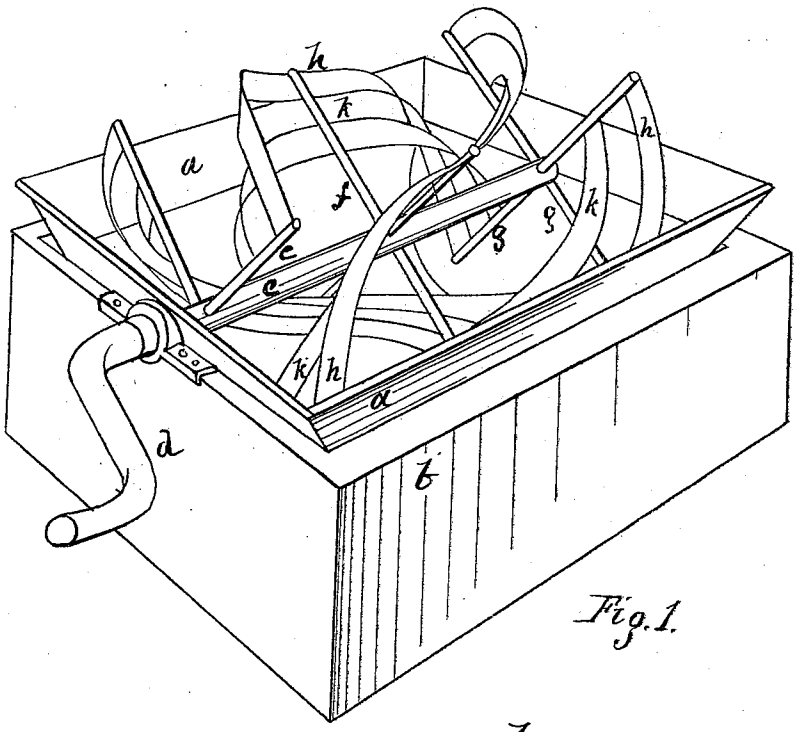

Fig. 1.

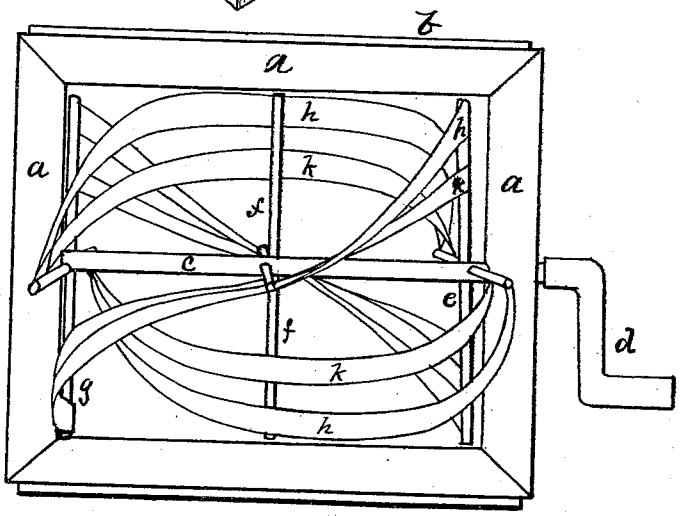

Fig. 2.

Witnesses:

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Henry Elmer.

Inventor:

James G. C. Lee

per John Inglis Jr. & Co.

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UNITED STATES PATENT OFFICE.

JAMES G. C. LEE, OF NEW YORK, N. Y.

IMPROVEMENT IN LARD-COOLERS.

Specification forming part of Letters Patent No. **169,180**, dated October 26, 1875; application filed July 19, 1875.

To all whom it may concern:

Be it known that I, JAMES G. C. LEE, of the city, county, and State of New York, have invented a new and useful Improvement in Machines for Cooling, Whitening, Stirring, Mixing, Evaporating, and Solidifying Lard, of which the following is a specification:

My invention relates to that class of lard coolers or mixers wherein the material is stirred or moved by revolution of devices attached to a revolving shaft; and its object is to obtain a more perfect admission of air to the interior of the mass in cooling the same, at the same time to more thoroughly mix or stir the same; and my improved devices operate by causing a vacuum in the mass to follow the devices as they are turning. A motion is also caused lengthwise the devices whichever way the turning is directed; and my invention consists in providing the shaft with spokes, reaching outward therefrom at right angles thereto, and having attached ribbons or strips of metal, &c., arranged lengthwise the machine, passing from spoke to spoke, attached thereto, and arranged so as to form a spiral, each strip attached in the center to one spoke, and its one end attached to a spoke in advance of the center, and its other end attached to a spoke in rear of the center, and each ribbon or strip of metal running from end to end of the tank or trough containing the lard or other material in a spiral and worm-like curve, so that its forward end will nearly edgewise cut into the material in the tank, and also the flat face of the ribbon abut against the material as it passes through, and the lard be gently moved from the heads of the ribbon over toward the other end, and at the back of the ribbon a vacuum be formed in the lard material as the ribbon passes through, the lard not adhering to the metal, and air, rushing into the said vacuum, acts effectually to cool the same, which desired object my device effectually accomplishes.

In the tank, attached to the spokes reaching outwardly from the shaft, there may be many of the ribbons, according to the size of the shaft and tank, &c.

Figure 1 is a perspective view of the machine complete, showing exterior and part of interior. Fig. 2 is a perspective view looking directly into the top of the machine, and shows all the interior.

a represents the tank or trough in which the lard material is to be placed. *b* represents an outer casing or inclosure, so formed that between it and the shell of tank *a* space is formed, within which ice may be placed to facilitate the cooling. The said space may also be used for hot water, steam, &c. *c* represents the shaft, provided with crank *d*, or pulleys for power, if desired. *e*, *f*, and *g* are spokes standing out from the shaft *c*. I have shown three; but there may be more, if desired. *h* and *k* are the ribbons of metal. *f* being the center spoke, the ribbons are fastened thereto, and then curved forward, bringing them to the spoke *e*, and on the other side curving backward, reaching the spoke *g*.

I have used the words "forward" and "backward" merely to explain. The device works similarly if turned either way, and either end would be the forward end, according to the direction of revolving shaft.

It will be noticed, by reference to the drawings, that the one end of ribbons is opposite the center of the next series, and the other end is opposite to center of another series, and so on all the way around. In this manner a spiral or helical arrangement is formed, which is of great use.

The operation is readily seen. As the spirals are turned around through the lard material the ribbons enter head foremost, gradually coming in contact with the lard material as the shaft revolves. The lard is moved somewhat lengthwise, raked by the spokes and spirals, stirred, and mixed. As the spiral ribbons pass through behind the flat thereof a vacuum is formed in the lard material, permitting access of air to the interior of the material, facilitating the cooling, and also materially affecting its bleaching.

What I claim, and desire to secure by Letters Patent of the United States, is—

In combination with the shaft *c*, the series of spokes *e*, *f*, and *g*, provided with series of ribbons *h* and *k*, arranged to form spirals running lengthwise, one end thereof being connected to the end spoke next forward of the center line, and the other end connected to the opposite end spoke next behind their center line, and all arranged to operate substantially in manner and for the purpose described.

JAMES G. C. LEE.

In presence of—
JOHN INGLIS, Jr.,
HENRY ELMER.