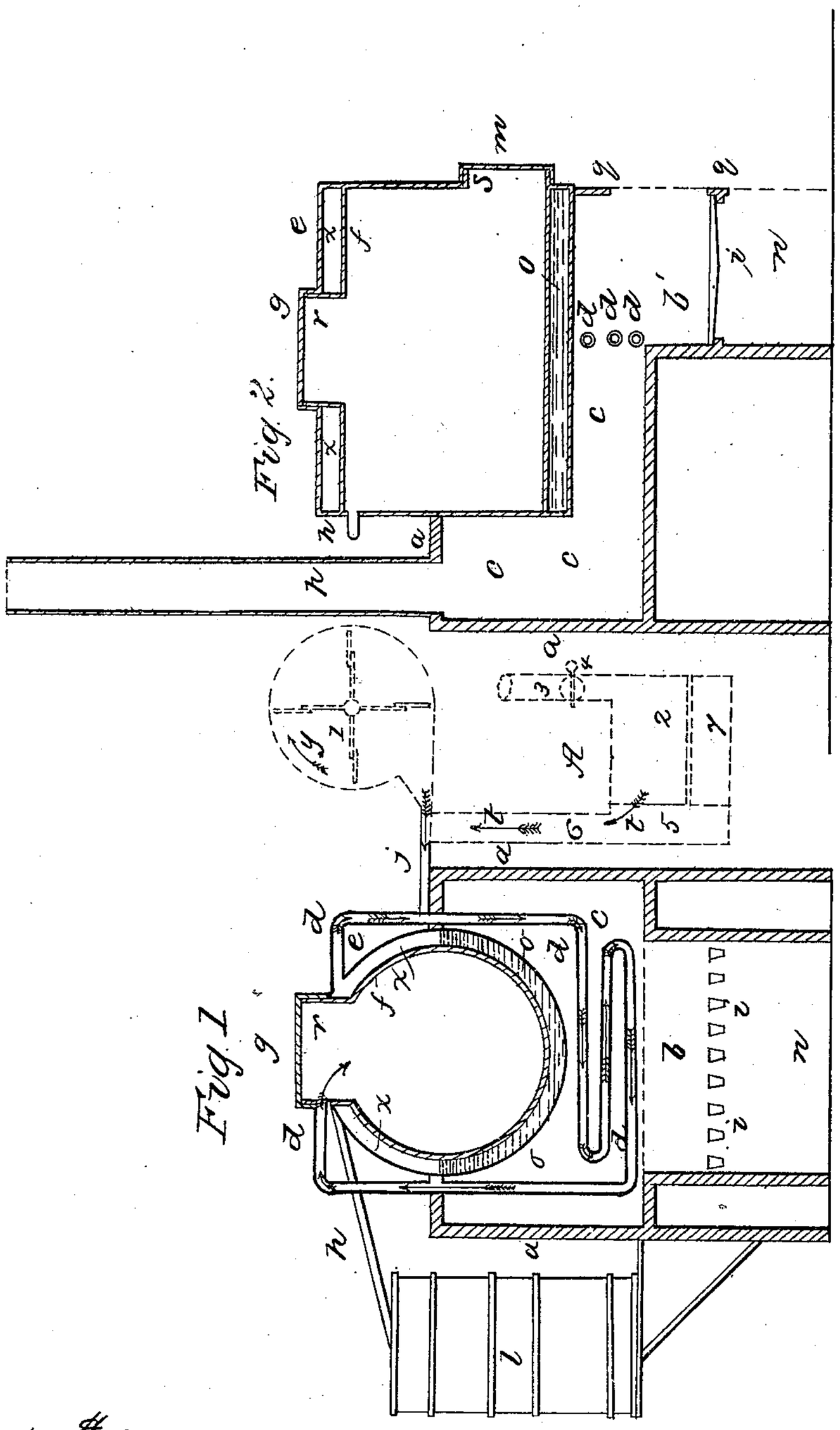
J. J. JOHNSTON.

Lard Rendering Apparatus.

No. 41,010. Patented Dec. 22, 1863.



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JAMES J. JOHNSTON, OF ALLEGHENY CITY, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR RENDERING LARD.

Specification forming part of Letters Patent No. **41,010**, dated December 22, 1863.

To all whom it may concern:

Be it known that I, JAMES J. JOHNSTON, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Apparatus for Rendering Lard; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the combination and arrangement of a steam and rendering boiler furnished with a pipe which passes from the steam-boiler through the fire to the rendering-boiler, and also in arrangement for forcing air and steam through said pipe for the purpose of being heated prior to entering the rendering-boiler, the whole being constructed, arranged, and operating in the manner hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, Figure 1 is a transverse section of the lard-rendering apparatus. Fig. 2 is a longitudinal section of the same.

a represents the brick-work or furnace-walls. *b* represents the fire-chamber. *c* represents the heat-chamber of the furnace. *i* represents the grate-bars. *n* represents the ash-pit. *p* represents the smoke-stack. *e* represents the steam boiler, and *f* represents the rendering-boiler, which is furnished with openings *r* and *s*, which are closed by caps *g* and *m*. It will be observed that the rendering-boiler *f* is placed inside of the steam-boiler *e*, with sufficient space between them for water and steam.

O represents the water, and *x* the steam, space.

To the steam-boiler *e* is attached a steam-pipe, *d*, which passes down and traverses back and forward in the furnace and passes up and is connected to the rendering-boiler *f*. To the back end and near the top of the rendering-boiler is attached a condensing-pipe or worm, *h*.

l represents the water-vessel of the condensing-worm. On the condensing-worm near to the boiler *f*, I place an ordinary safety-valve, arranged so that the escape from the boiler *f* will pass into and down the worm *h*, so that any lard or oily matter which may pass off with the escape can be condensed, and thereby saved. The water in vessel *l* should be heated up to about one hundred (100°) degrees Fahrenheit, which temperature will be sufficient to hold in a liquid state the lard, and also condense the escape from the rendering boiler *f*. If the water in vessel *l* is kept too cold, the lard which may pass off with the escape will clog up the worm, thereby making it inoperative. I also furnish the steam-boiler *e* with an ordinary safety-valve, gage-cocks, and other appendages common to steam-boilers. I also place a steam cock or valve on the pipe *d*, near to the point where it is attached to the boiler *e*. This steam cock or valve is used for regulating the admission of steam into the pipe *d*. To pipe *d* is attached a pipe, *j*, which is connected with a fan and a furnace, as indicated by red dotted lines, in which 1 represents the fan. The arrow *y* represents the revolving course of the fan. A represents a charcoal-furnace which I use for generating carbonic acid gas or vapors of charcoal. 2 represents the fire-chamber of the furnace. 7 represents the ash-pit. 3 represents the smoke-stack. 4 represents a damper which I place in the smoke-stack for the purpose of closing it. After the charcoal has become thoroughly lit or kindled and emits but little smoke, the vapors of the charcoal will then escape into the chamber 5, from which it will pass up pipe 6 into pipe *j*, from which it is forced by the fan into pipe *d*. A cylinder or a series of cylinders, such as are used for smelting-furnaces, would be preferable to the fan for forcing the vapor or air into pipe *d*.

I wish it to be understood that I represent the fan and furnace (shown by the red dotted lines) for the purpose of giving a clear understanding of the working of my improved apparatus for rendering lard. Any other device may be used which will produce the same effect—to wit, make a vapor from heated charcoal heated air, and force them through pipe *d* into boiler *f*. I use the vapor of heated charcoal for the purpose of surcharging heated air with carbonic-acid gas, which I force into the rendering-boiler *f* for the purpose of sweetening the lard when rendering from meat which has become "sour."

In rendering out lard from sweet meat I use simply heated air in combination with

steam. It will be readily observed that by the use of my improved apparatus steam, or superheated steam, can be used by itself, heated air by itself, heated air surcharged with vapors of heated charcoal (carbonic-acid gas) by itself, or steam and heated air combined; the latter I prefer for general use in rendering.

The operation of my improvement is as follows: Having all things constructed and arranged as herein described and represented, with the rendering-boiler *f* furnished with suitable cocks for drawing off the lard, and the steam-boiler supplied with water by any one of the known means, I then remove the cap *g* and fill the boiler *f* with the meat to be rendered out. I then replace the cap *g*. I then "set" the safety-valve of the steam-boiler *e* so that it will not allow the boiler to carry over twenty-five pounds of pressure of steam. I also set the safety-valve placed on the condensing-pipe *h* so that it will allow the rendering-boiler *f* to carry only twenty pounds pressure of steam or heated air. I then start the fire under the boiler *e*, and when steam has been raised to the desired height or pressure, I then admit a jet of steam into pipe *d*. I then start the fan 1 (or cylinders, when they are used) and force air into pipe *d* through pipe *j*, taking care to have the air heated to about to about two hundred and fifty (250°) Fahrenheit. The steam and air combine in pipe *d*, (forming one element,) where it is heated to any degree desired, after which it is forced into boi'er *f*, where it acts on the meat and renders the lard from it, which is drawn off after being sufficiently cooked. After all the lard is rendered from the meat and is drawn off at the cocks provided for that purpose, I then remove the cap *m* and draw off the refuse.

When I render lard from sour meat, I use heated air surcharged with the vapors of heated charcoal without the addition of the steam.

The following are some of the advantages of my improved apparatus for rendering lard: First, economy of room by placing the rendering boiler within the steam-boiler; second, economy of fuel and heat by the arrangement of said boilers and by passing the pipe *d* over the fire in the furnace of the steam boiler; third, safety of the apparatus, it never being necessary to carry in the boilers more than twenty-five pounds pressure of steam or heated air, and yet have a very great rendering force; fourth, making a good white lard, equal to kettle-rendered lard, by the use of steam and heated air combined; fifth, making a good and sweet lard from sour meat by the use of heated air surcharged with the vapors of heated charcoal; sixth, saving the lard, which is usually carried off with the vapors raised in the ordinary process of rendering lard, by the use of the condensing-worm and its s.fety-valve; seventh, economy of time and labor by the arrangement for charging the rendering-boiler and for drawing off the refuse.

Having thus described the nature, construction, operation, and advantages of my improvement, what I claim as of my invention is—

1. The arrangement of the boilers *e* and *f*, furnished with openings *r* and *s*, caps *g* and *m*, and pipes *d* and *h*, the whole being constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

2. The use of heated air, or heated air and steam combined, or heated air surcharged with the vapors of heated charcoal, when used in connection with the apparatus herein described, or with the equivalent of said apparatus, and for the purpose set forth.

JAMES J. JOHNSTON.

Witnesses:
ALEXANDER HAYS,
WESLEY JOHNSTON.