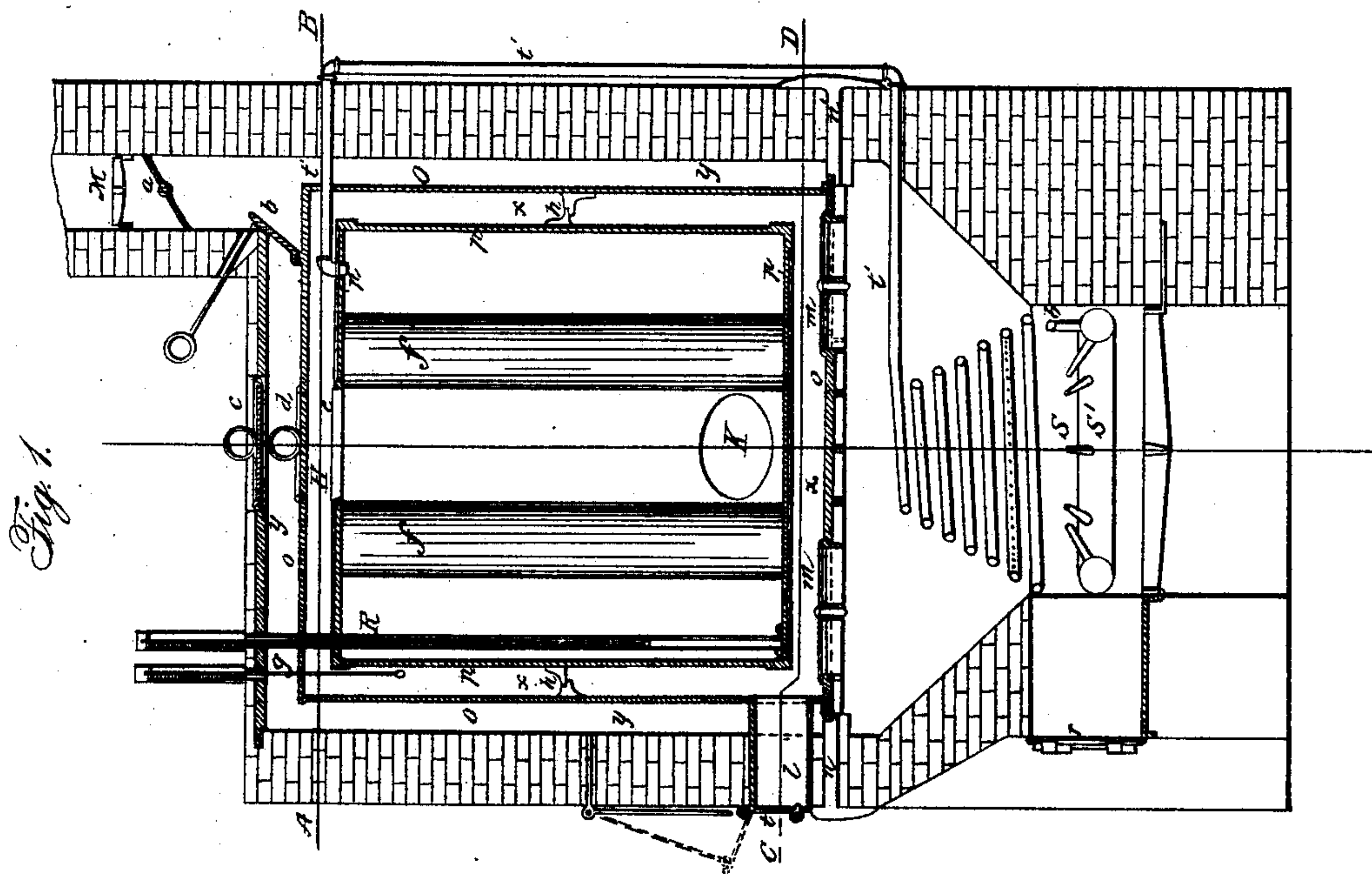
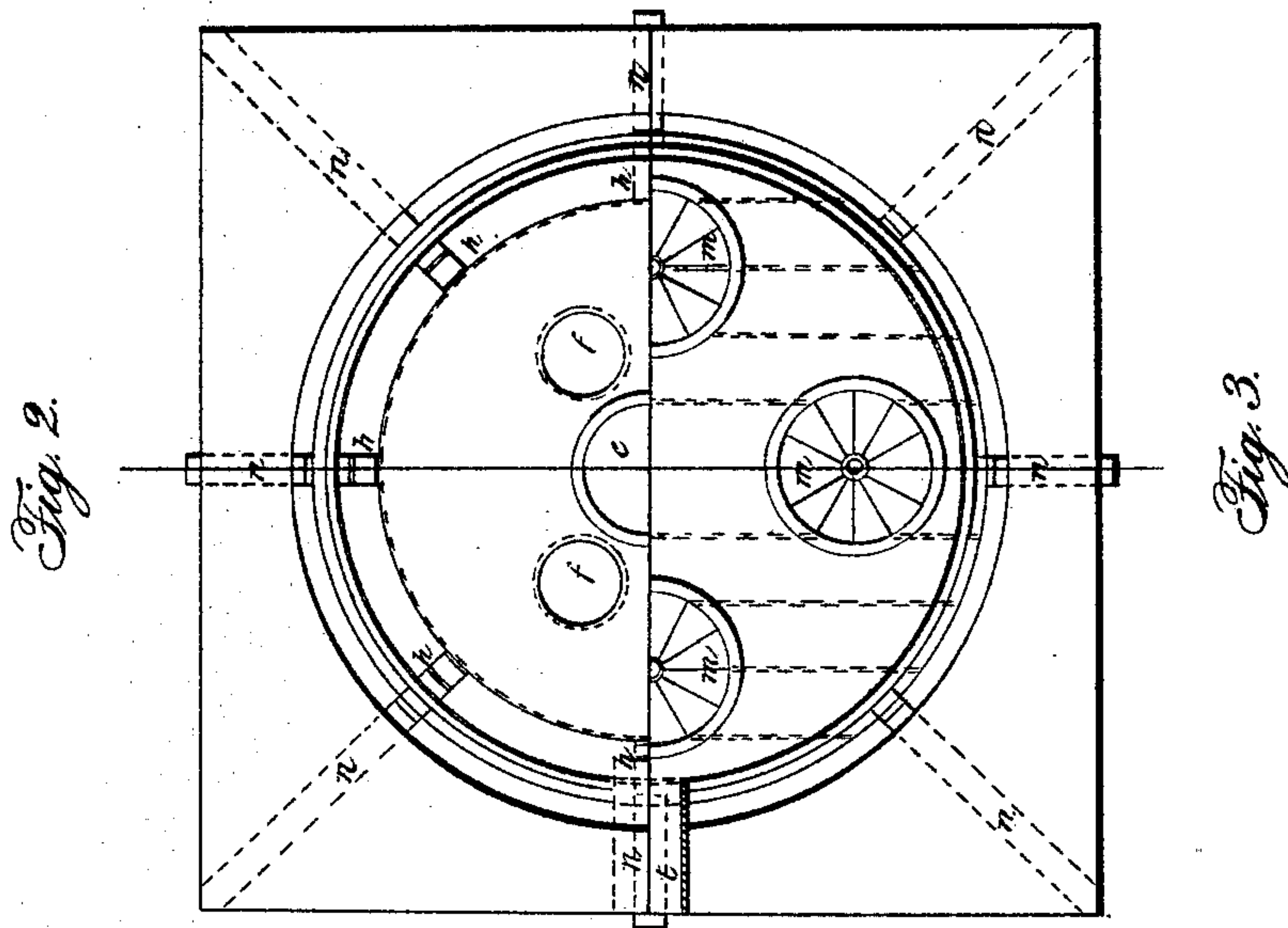


A. BROADNAX.
Rendering Apparatus.

No. 69,897.

Patented Oct. 15, 1867.



Witnesses:

Samuel Whitehead
Lawrence Hoar.

Inventor:

Amos Broadnax

United States Patent Office.

AMOS BROADNAX, OF NEW YORK, N. Y.

Letters Patent No. 69,897, dated October 15, 1867.

IMPROVED APPARATUS FOR RENDERING LARD AND TALLOW.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, AMOS BROADNAX, of the city and county and State of New York, have invented certain new and useful Improvements in Rendering Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 is a vertical section through the centre of said improved apparatus, and the upper part of Figure 2 shows a horizontal section taken on the line A B, and the lower part of said figure illustrates a section taken on the line C D.

My invention consists of a novel method of applying the heat to a rendering-tank, and also in a more efficient method of regulating the heat applied to such apparatus, and of disposing of the noxious gases and vapors.

In the drawing, P P represents the tank; which is composed of boiler iron, or it may be made of cast iron, but I think boiler iron most suitable, for of this last-mentioned material the tank can be made much lighter and more sensitive to the heat, and I think cheaper than so large a vessel could be made of cast iron. The drawing shows this tank made with three flues, *ff*, through it, but it is obvious that these flues may be increased or decreased in number or size, or they may be omitted altogether. Their object being to increase the heating or rendering surface of the tank, their number and size must of course be proportioned to the size of the apparatus and the work it is intended to accomplish. The tank is also provided with a man-hole, through which the charge to be rendered is introduced. This man-hole is shown by C; and at K a nozzle is shown, through which the refuse is discharged after the rendering is accomplished. Both of these holes or nozzles must of course be fitted with plates duly secured to make them tight, the same as in the case of the ordinary steam-rendering tank, unless the tank is to be used as an open kettle, in which case the cover is to be left loose on the hole *c*. This tank I put into a heating-chamber, represented in the drawing by H, and arrange it so as to leave a flue on every side of it, as shown by X, supporting the tank on brackets, *h*, riveted or bolted thereto, which brackets on the tank are arranged to bear on corresponding brackets riveted to the plate O O, which form the chamber in which the tank is set. This chamber I propose to form of iron plates, as shown by O. It may, however, be made of brick-work, though I think iron the best material, and either wrought or cast iron may be used, but the bottom plate should, I think, be of cast iron, and should be thicker than the side plates, and should be made with T-shaped ribs on its bottom side, leaving spaces between them of from six inches to a foot wide, which should be filled with fire-bricks or clay to keep it from being burned out; and said bottom plate should also be made or fitted with registers or dampers *m m* arranged to open and close so as to regulate the admission of heat from the furnace S to the chamber X around the tank. This chamber X, in which the tank is placed, and which is so formed by the plates O, I place or build in a chamber, Y, formed by brick walls, and so arrange it as to have a flue or space, Y, on the outside and top of the plates O, covering the top of this chamber either with an iron plate covered with brick or with brick-work, as may be most economical and efficient, making holes C and D in the two top plates over the hole *c* in the tank to afford means of access to the tanks. These tanks, instead of being made cylindrical, may be made square or long, deep, and narrow, and a number of them may be placed in one heating-chamber, instead of one, as shown in the drawing. By these means a large rendering surface can be obtained without the use of the flues *ff*, while at the same time the apparatus would be substantially the same, the tank being merely changed in form.

Now, in operating this apparatus, after the tank has been duly charged with fat the dampers *m* are opened and the heat is allowed to flow in the chamber X, directly from the furnace, until the temperature in the tanks has been raised as high as it can be raised without burning the fat. The dampers or registers *m* are then closed and the heat from the furnace flows up through the chamber or flues Y, by which the temperature in the chamber X is maintained uniformly until the charge is rendered; but should the temperature in the tank accidentally get too high the damper *t* is to be opened, by which a current of cold air is admitted through the nozzle *l* into the chamber X around the tank, the last-mentioned chamber being fitted with said nozzle for that purpose, and said chamber X is also fitted with a damper, *b*, by which the draught from the furnace through said chamber is regulated, as well as the draught of cold air through the nozzle *l*, the draught through the chamber Y being

regulated by the damper *a* in the chimney. The temperature in the tank is ascertained by means of a thermometer, *R*, introduced into the tank and encased in a close tube, which tube should be filled with mercury to maintain the sensibility of the thermometer; and the temperature of the chamber *X* is ascertained by means of a thermometer, *g*, fitted therein for that purpose. The registers *m* in the plate *O* are represented in the drawing as being made circular, and arranged under the tank so that when open the heat will strike the bottom of the tank. But a better way of making these registers is to make them in the form of a segment of a circle, that is, the openings, making the covers to correspond in form, and connecting them together, so that they can all be opened an equal distance simultaneously, by which the heat can be uniformly distributed on all sides of the tank, and they should be arranged as nearly under the flues *X* as possible, so that the heat can strike up the flue instead of against the bottom of the tank, which in that case would be likely to become excessively heated.

In rendering fat in this apparatus there will be generated certain noxious gases and vapors, which it is necessary to dispose of in such a manner as to avoid the nuisance which would ensue were the gases allowed to escape in the building or open atmosphere. These gases and vapors I propose to consume, either by carrying them through the pipe *i i* to a coil of pipe in the furnace, as shown by *T S*, perforating the coil to allow the gas or steam to escape in the furnace in small jets for consumption, or by leaving the cover off the tank, making it in fact an open tank, and leaving the steam and gas go off as fast as generated and pass up through the furnace *M* in the chimney above the apparatus, where it will be consumed. In practice, however, this furnace should have a separate flue, leaving the main chimney clear of obstruction. In the use of this apparatus the fat is rendered by a dry heat without the aid of steam either in an open or a close tank, so there can be no danger of explosion, as there is little or no pressure in the apparatus even when closed; nor is there any accompanying boiler to supply steam; nor is there any steam generated in the tank to aid to carry on the rendering of the fat; nor is there any danger of burning the fat, for the temperature can be regulated perfectly; and, moreover, the apparatus is cheap and simple, and supplies an efficient method of disposing of the noxious gases and vapors; by all of which means I get a very superior quality of fat dry and free from water, and at the same time I do not make my establishment a nuisance.

What I claim, therefore, and desire to secure by Letters Patent, is—

1. Rendering fat with a dry fire heat, either in an open or a close tank, by enclosing said tank in a heating-chamber so made and arranged as to entirely surround the same, substantially as described.
2. Combining a dry-rendering apparatus in a dry-heating chamber made of metal, and placing said dry metal heating-chamber in a brick chamber over the fire or furnace, and so arranged as to leave a flue around the metal chamber, substantially as described.
3. The use of the intervening plate *S*, either with or without the fire-bricks or clay facing between the furnace and the tank, by which the fire can be entirely excluded from the tank.
4. Arranging an open rendering-tank in a heating-chamber made to entirely enclose it, and arranged to allow the gas and vapor to escape in the chimney under a furnace, substantially as described.
5. In combination with a rendering-tank, the use of a thermometer arranged in a tube in said tank, filled with mercury, substantially as described.
6. The use of a ventilator, in combination with a rendering-tank enclosed in a heating-chamber for the purpose of reducing the temperature in said chamber, substantially as described.
7. Making an intervening flue between the tank and the fire-flue to aid in regulating the application of heat to the tank, substantially as described.
8. Connecting the steam and gas-discharge pipe of a rendering-apparatus with a large separate chamber or pipe *S'*, arranged in the melting-furnace of the apparatus, to allow the steam and gas to expand and heat in said chamber or pipe in the furnace after it leaves the discharge-pipe, and before its consumption.

AMOS BROADNAX.

Witnesses:

PETER D. KENNY,
H. S. FIRMAN.