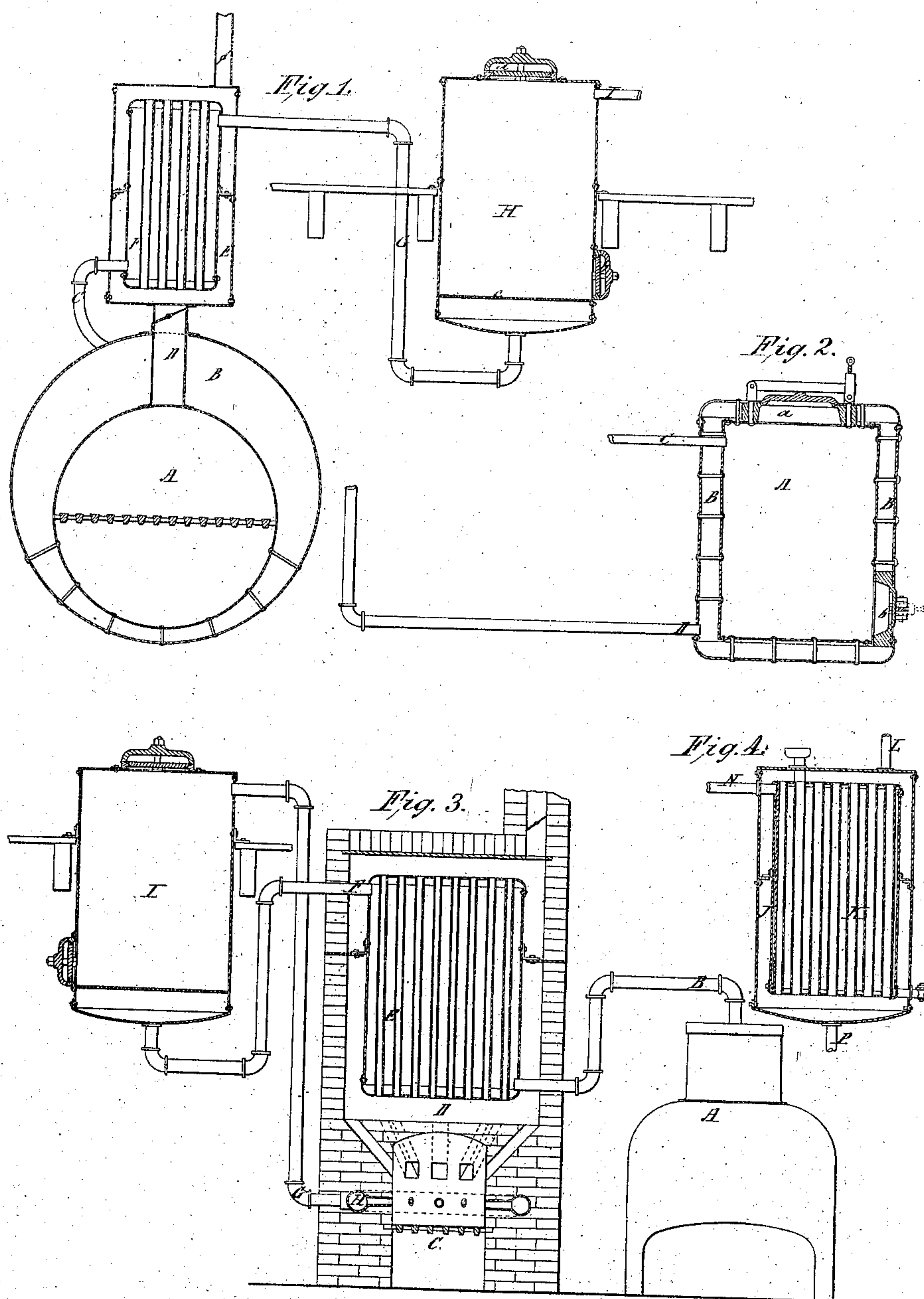


No. 81,744.

PATENTED SEPT. 1, 1868.

A. BROADNAX.
RENDERING AND REFINING LARD, OIL, &c.



Witnesses:

Edward P. Hunt
Peter O'Henny

Inventor:

Amos Broadnax

*The drawing in this part
is not in print.*

United States Patent Office.

AMOS BROADNAX, OF MONT CLAIR, NEW JERSEY.

Letters Patent No. 81,744, dated September 1, 1868.

IMPROVEMENT IN RENDERING AND REFINING LARD, OILS, &c.

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 Mont Clair, county of Essex, and State of New Jersey, doing business at 161 Broadway, New York city, have invented certain new and useful Improvements in the Art of Rendering and Refining Fatty and Oily Matter; 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 illustrates a transverse section through the furnace and steam and water-space of a common Cornish boiler, and a vertical section through a superheater applied to said boiler, and also a vertical section through a tight rendering-tank; the boiler being shown by A B, the superheater by E F, and the tank by H.

Figure 2 illustrates what is known as a jacket-tank, to be used in place of the tank H, A representing the inside tank and B the outside one, the steam, heat, or water, being introduced in the space between the two.

Figure 3 illustrates a front elevation of a common wagon-boiler, shown by A, a vertical section through a superheater, shown by E D, a vertical section through a close rendering-tank, shown by I, and a vertical section through a refining-still, shown by J K, all of which methods illustrate different parts of my invention, and modes of applying the same.

To enable others skilled in the arts to which my invention appertains to make and use the same, I will proceed to describe the construction and operation of the various parts appertaining thereto, and the manner in which they are applied to use.

In fig. 3 of the drawing, A represents, as I have before stated, a common wagon-boiler, connected, by means of a pipe, B, to a superheater, shown by E D. This superheater consists of a cylindrical drum, filled with tubes, and set into a brick chamber also cylindrical, over a covered furnace constructed with flues radiating from the inside circumference thereof, to the inside circumference of the brick chamber in which the tube-drum is placed, substantially in the manner shown.

From the superheater there is a pipe, F, leading to the digester I, in which the fat or other matter is put to be rendered or otherwise treated, said digester to be provided with a false bottom, and the usual man-holes, through which it is to be filled and discharged, and with a pipe, G, to carry the steam and offensive gas in the pipe H, which surrounds the furnace, and is provided with jet-pipes to throw it into the fire, in the manner shown.

In operating this apparatus, the steam is generated in the boiler A, and carried from there to the superheater, where it is highly heated, and from whence it passes into the digester through the fat, and out through the pipe C into the fire. The pressure in the boiler or generator A should be low, just high enough to carry the caloric forward out of the superheater, through the fat in the digester, and the pipe G should be kept open, or partially open, so as to insure a continual flow of the superheated steam through the fat.

In rendering fat by steam after the old method, it is necessary to carry a high pressure to get the necessary temperature to melt the fat. This pressure injures the fat, spoils the scrap, endangers the apparatus, and makes it difficult or impossible to consume or deodorize the offensive gases. These obstacles I overcome by superheating the steam in a separate superheater on its way from the boiler or generator to the digester, the superheater, acting as a magazine of caloric, which I carry over to the digester by blowing or passing the steam through it. For the steam, however, there may be substituted a blast of air, which will accomplish the same result, I think, quite as well, or better.

In constructing the apparatus, the superheater must be arranged, in relation to the fire, so as to insure the necessary temperature, without allowing the fire to impinge against it.

This object I accomplish by putting the superheater in a brick chamber, over a covered furnace, constructed to throw the caloric up around it, and through it, without impinging on it. The construction of the furnace is shown in fig. 3.

In fig. 1 of the drawing is shown a modification of my invention, differing from the one last described in that the superheater E F is arranged directly over an ordinary Cornish boiler, with a flue, D, leading from the

bottom of it directly down through the water-space to the furnace, the flue being fitted with a damper to regulate the admission of heat to the superheater, substantially in the manner shown.

In this arrangement the steam is carried directly from the steam-space B of the boiler to the superheater, through the pipe C, and from thence through the pipe G to the digester H, the same as in the case of the figure last described, the principle and mode of operation being substantially the same.

In fig. 2 of the drawing there is shown a double or jacket-digester, the fat being put into the inside one A, and the superheated steam through the pipe D in the jacket B, the offensive steam and gas being drawn out through the pipe C, to the fire, as before stated in describing fig. 3, and the digester being in this case supplied with the usual man-holes, plates, and mountings, through which the matter to be treated is introduced and discharged.

In Figure 4 of the drawing there is shown a refining-digester, K, being a cylindrical drum, filled with tubes, which drum is put in a second drum, J. This refiner is for the purpose of distilling or refining petroleum oil, or other similar matter.

The operation is as follows:

The oil is put in the tube-drum through the funnel Q, and the superheated steam is applied through the pipe P, the same as in the case of the figures hereinbefore described, and the temperature is raised high enough to distill the oil over through the pipe N, to a condenser, which may be of the ordinary construction, the refuse oil being drawn out through the cock O, and the steam out of the superheater through the pipe L.

By these means petroleum can be distilled and refined by steam without pressure, and without danger of fire, or the distiller may be set as far from the furnace or fire as may be desired.

In operating this invention the superheater should in all cases be supplied with a thermometer to measure the heat going into the digester or still.

Having now described the nature and operation of my invention, I claim as new herein, and desire to secure by Letters Patent—

1. The use of a steam-superheater, in combination with a steam-boiler or generator, and a rendering-digester or distiller, and in which the temperature can be regulated, for the purpose of rendering fat or distilling oil by superheated steam or air, substantially as described.

2. Rendering, refining, or distilling fat or other oleaginous matter by steam or air, superheated in a separate superheater, on its way from the boiler or generator to the digester containing the fat or oil.

3. Superheating steam or air in a magazine or chamber, C, and carrying said steam or air over into the digester or distiller by a blast or current of steam or air, substantially as described.

AMOS BROADNAX.

Witnesses:

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