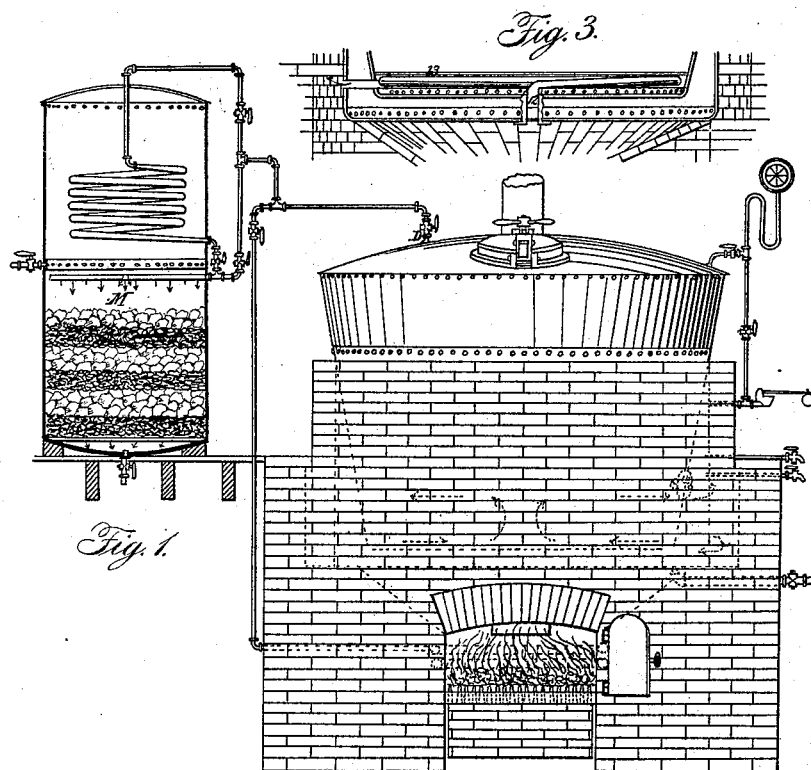


C. J. EVERETT.

Rendering Apparatus.

No. 52,640.

Patented Feb. 13, 1866.



Witnesses:

*Amos Brundage*

*Radcliffe B. Lockwood*

Inventor:

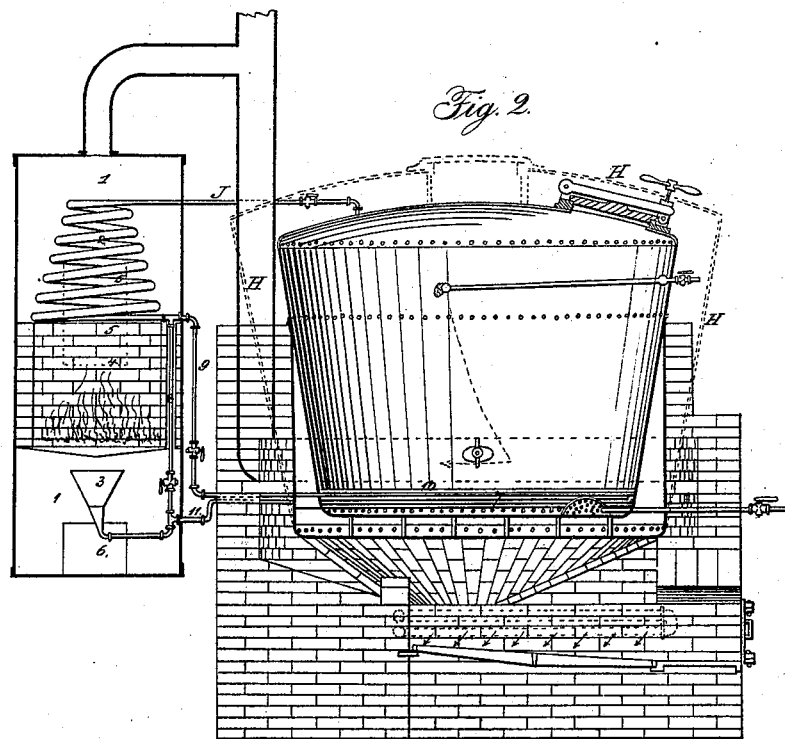
*Chas J. Everett*

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# UNITED STATES PATENT OFFICE.

CHARLES J. EVERETT, OF NEW YORK, N. Y., ASSIGNOR TO LOCKWOOD & EVERETT.

## IMPROVEMENT IN RENDERING APPARATUS.

Specification forming part of Letters Patent No. 52,640, dated February 13, 1866.

### *To all whom it may concern:*

Be it known that I, CHARLES J. EVERETT, of the city and county of New York, 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 drawings, making part of this specification, in which—

Figure 1 is a front elevation of an apparatus and furnace; Fig. 2, a vertical section of such an apparatus and furnace with my improvements applied thereto; and Fig. 3 is a vertical section through the bottom part of the digester shown in Fig. 2, and illustrates a further improvement applied to said apparatus.

My invention consists in certain improvements in rendering-tanks, which, for the purpose of more fully illustrating, I will describe as applied to the invention of one Carroll E. Gray, for which Letters Patent of the United States were granted to him on the 31st day of January, 1865, and which were reissued to said Gray on the 8th day of August, 1865, and which Letters Patent have been duly assigned to myself and one Radcliff B. Lockwood, of the city, county, and State of New York, and in which Letters Patent the said Gray describes his said invention, its uses, objects, and advantages, as distinguished from other apparatuses for similar purposes, and to which reference is here made to show how far said Gray's improvements in said apparatus extend and where my improvements begin in their application to this apparatus.

The drawings hereunto annexed give an exact copy of the drawing annexed to the patent of said Gray, with my improvements added thereto.

It will be seen by reference to the said reissued patent of said Gray that he provides means for carrying the noxious gases and vapors issuing from said digester during the operations of rendering to the furnace under said digester for consumption, to avoid the nuisance which arises from said gases and vapors when allowed to escape into the atmosphere. But in the practical operation of this apparatus it is found necessary, after the fat has

been sufficiently cooked or rendered, to draw the fire from under the digester to allow the fat to cool somewhat previous to drawing it off, so that the noxious gases and vapors which pass off from the digester after the fire has been withdrawn escape into the furnace unconsumed, occasioning an exceedingly offensive and noxious odor in the establishment. And, moreover, the furnace under the digester is not well adapted to receive a superheating device to prepare the gas for consumption, for if a coil of pipe be placed in the fire of the furnace it soon burns out. If it be placed behind fire-brick it is not hot enough, and the furnace is not high enough to admit of its being placed over the fire, and if it did it would be of no use after the fire is withdrawn. The provision, then, in Gray's apparatus for consuming the gases and vapors is not perfect.

To supply a remedy for this imperfection or defect in the apparatus of Gray and in other apparatus for a similar purpose is one of the objects of my invention. This object I accomplish by the use of a separate gas consumer and superheater, (shown in the drawings by 1,) and which I make in the form of a cylinder, as shown in the drawings, or of such other form and proportions as will best accomplish my object. In this consumer I arrange grate-bars, upon which I construct a furnace, as shown by 4, by the use of fire-brick or soapstone, with which I line the cylinder, substantially in the manner shown. In the upper part of this consumer I arrange a coil of pipe, as shown by 2, the upper end whereof I connect to the discharge-pipe J, leading to the digester, and the lower end whereof I connect to a pipe, 8, leading down through the fire-brick in the ash-pit, where it turns up and terminates in a funnel-shaped end, as shown by 3. By this arrangement of devices, and their application to the furnace, the gases, steam, and vapors, as they pass from the digester through the coil over the furnace, are highly superheated, and as they pass from the nozzle of the pipe they are carried by the draft of the furnace through the fire, when they are thoroughly consumed, while at the same time they aid in superheating the vapors and gases issuing from the digester. The consumer should

be placed in some convenient position near the digester, in easy communication with the chimney, and should be supplied with a large pipe fitted with a damper, that a rapid draft may be obtained when necessary.

In place of the coil to superheat the vapor a drum may be used; but I prefer the coil, as being cheapest, safest, and best adapted to the end sought after.

The consumer is fitted with a door, (shown in dotted lines by 5,) through which fuel is supplied, and the ash-pit is also fitted with a door, (shown by 6,) by which the supply of air is regulated.

After the apparatus has been once put in operation very little air is required to support combustion in the furnace, as the oxygen necessary for this purpose will be supplied by the superheated gas and vapor flowing from the digester through the nozzle under the grate-bars. The steam, vapor, and gas from the tank might be introduced into the fire directly from the digester and in a great measure consumed, provided the furnace contained a fire of great intensity, as in such cases the water-vapor is decomposed by the fire, the oxygen uniting with the fuel, and the hydrogen burning up with a blaze; but if the fire in that case should happen to be low, the water-vapor would put it out, and the noxious gases would escape unconsumed, so that it will not be safe to dispense with a superheater and rely upon this method.

In the practical operation of the aforesaid apparatus of Gray it is found to be impossible to crisp or dry the scrap after the rendering is completed, owing to the absence of sufficient heat to drive out the water in the case of drying the scrap, or to heat the fat in the case of crisping it, so that in this respect, also, the apparatus of Gray is imperfect.

To cure this defect is another object of this invention, which object I propose to accomplish by either of the following methods—that is to say, by fitting the digester with a coil of pipe, (shown by 7,) and covering it with a perforated false bottom, (shown by 10,) and by connecting one end of this coil, by means of a pipe, 9, to the lower end of the coil 2, and by connecting the other end of the coil 7, by means of a pipe, 11, to the lower end of the pipe 8, and by fitting these pipes with cocks, as shown in the drawings, so as to turn the superheated gas and vapor out of the coil 2 into the coil 7, and from thence deliver it under the grate-bars for consumption. By these means additional heat can be obtained in the tank to drive off the water and dry the scrap after the fat has been withdrawn, or to crisp it by raising the temperature of the fat to the necessary degree. The pipes connecting these coils, when they pass through the water-space of the digester, should be fitted with nuts and screws, so as to form a water and steam tight union-joint in the usual way, or the pipes may be provided with a

thread and simply screwed through the shell of the digester and on the outside of the water-jacket after the old manner of staying the water-space around the furnace of steam-boilers. This additional heat to crisp or dry the scrap in the digester, as aforesaid, may be obtained in the manner shown by Fig. 3—that is, by introducing a pipe into the bottom of the digester through the water-space, as shown by 12, and connecting with said pipe a coil, (shown by 13,) the other end of which leads out through the water-space into the chimney, the lower end of the pipe 12 being fitted with a damper to exclude the heat of the furnace when not required in the digester, the heat passing from the furnace under the digester through this coil into the chimney when the time comes to crisp or dry the scrap, as aforesaid.

In the practical operation of the aforesaid apparatus of said Gray it is found that the steam and vapor, which holds in solution a large amount of the noxious gases, is condensed against the upper or uncovered part of the digester, above the water-jacket, and falls back again into the fat, where it has again to be evaporated and the noxious gases have again to be driven out of the fat. To overcome this objection I propose to carry the water and steam jacket all the way around the digester, so as to completely envelop it with a sheet of hot water and steam, as indicated by the red lines *x x*, Fig. 2.

The said apparatus of said Gray is defective also in the deodorizer M, which, indeed, can scarcely be called a deodorizer at all, inasmuch as it does not contain any proper deodorizing or disinfecting material. The said Gray says he fills his deodorizer with lime or plaster and charcoal. These substances placed in his chamber make a very good filter, but they do not decompose the noxious gases, and cannot therefore deodorize or disinfect them, which can be done only by decomposition. Lime and plaster take up some of the noxious vapors, but not enough to render them inoffensive or to be classed among the disinfectants or deodorizers.

To remedy this defect I propose to use chloride of lime or of soda, or their chemical equivalents, for this purpose, for filling the deodorizing-chamber with, by which a perfect decomposition of the gases is obtained, and by which they are completely deodorized and disinfect, mixing some charcoal with the chlorides to keep them dry and loose.

I have shown and described these improvements as applied to the invention of said Gray, as some of them are applicable only to that kind of an apparatus; but the gas and vapor superheater and burner and the deodorizer are equally applicable to other apparatus for rendering and refining fatty or other oleaginous matter, or indeed to any apparatus where noxious gases or vapors are driven off; and so, too, with that feature of the invention compris-

ing the entire enveloping of the tank or digester with the steam or water jacket, so as to entirely avoid condensation in the digester.

Rendering-tanks have hitherto been made with steam-jackets covering part of their surface; but I am not aware that any has been made entirely enveloped with the steam-jacket, so as to avoid condensation in the digester altogether. Such a digester may be made and covered with some non-conducting material, to prevent radiation of heat from the jacket, and used by itself with great success, steam being introduced into the jacket from a boiler, after the old method, or water may be put in it and fire applied, after the method of Gray.

I therefore intend to claim these features of the invention, not as improvements upon Gray's apparatus, but as an improvement which may be used as part of any rendering apparatus, or for any purpose where a steam-digester is used, for distilling, rendering, or cooking any kind of oils, greases, or animal and vegetable matter, intending to claim the improvements without regard to the uses to which they are put.

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

1. Consuming the noxious gases, steam, or vapors as they issue from the apparatus while in operation, or after the fire has been withdrawn therefrom, by the use of a separate consuming-furnace connected to or in communication therewith.

2. The use of a superheater, in combination with said consuming-furnace, and in connection with the apparatus, for the purpose specified.

3. Passing the superheated steam, gas, or vapor through a coil of pipe placed in the digester, for the purpose of raising the temperature in the digester and to dry or crisp the scrap, as set forth.

4. Carrying the heat directly from the furnace through a coil of pipe placed in the digester, and so arranged as to discharge in the chimney, making said coil a flue from the furnace to the chimney, for the purpose of raising the temperature of the digester and to crisp or dry the scrap, as set forth.

5. Avoiding the condensation of the noxious vapors and gases against the uncovered part of the digester by carrying the steam and water jacket all the way around it, so as to entirely envelop the digester, as set forth.

6. I do not claim the deodorizer as such; but I claim the use of a deodorizer filled with chloride of lime, or its chemical equivalents, for this purpose, in combination with a digester, for rendering and refining lard, tallow, and other fatty or oleaginous matter, for the purpose of deodorizing and disinfecting the noxious gases as they issue therefrom.

CHAS. J. EVERETT.

Witnesses:

AMOS BROADNAX,  
RADCLIFF B. LOCKWOOD.