

V. D. ANDERSON.

Steam-Generators and Apparatus for Rendering Fats.

No. 141,746.

Patented August 12, 1873.

Fig 1.

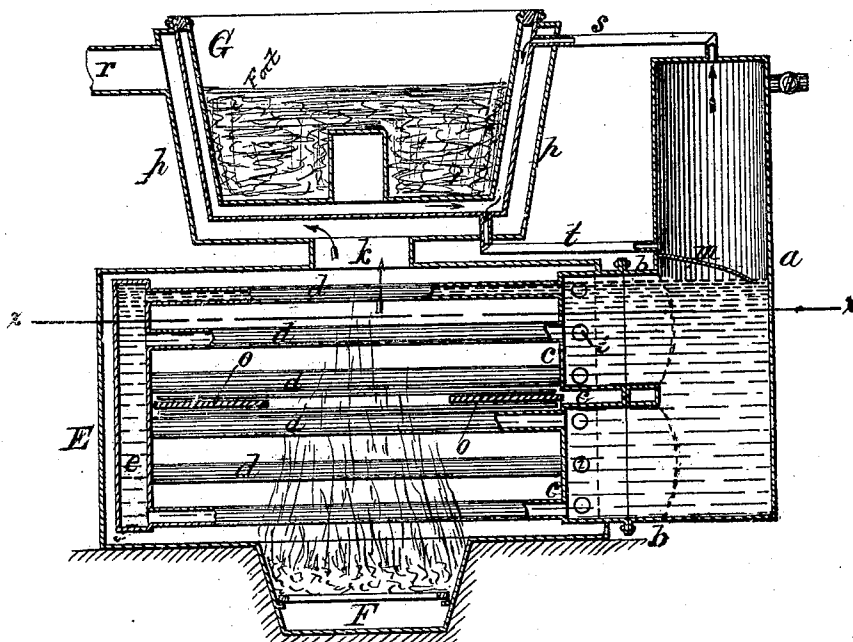


Fig 2.

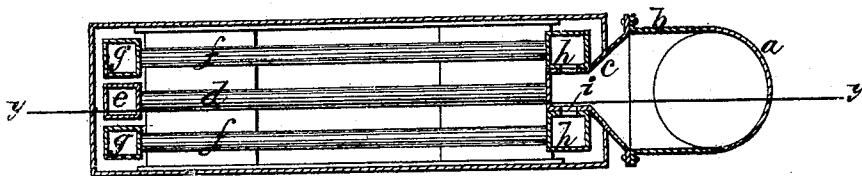
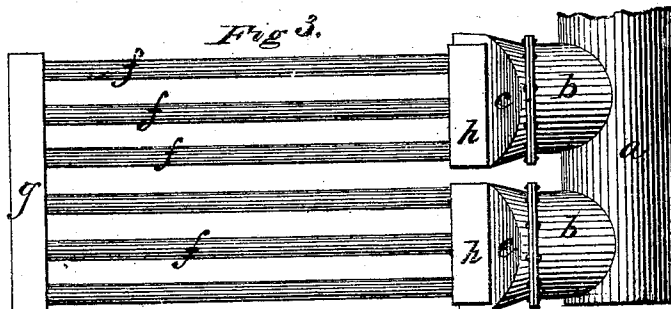


Fig 3.

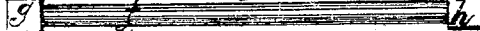


Witnesses.

Harry King.
S. M. Pool

Inventor.

Fig 4.



V. D. Anderson.
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UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN STEAM-GENERATORS AND APPARATUS FOR RENDERING FATS.

Specification forming part of Letters Patent No. 141,746, dated August 12, 1873; application filed May 14, 1873.

To all whom it may concern:

Be it known that I, VALERIUS D. ANDERSON, of Springfield, in the county of Clarke and State of Ohio, have invented certain Improvements in Steam-Generators and Apparatus for Rendering Fats, of which the following is a specification:

My invention relates to an apparatus for the use of butchers, farmers, and others, for generating steam and rendering fats, &c.; and the invention consists in a novel construction of the generator, and in so combining therewith a kettle that steam from the generator surrounds the kettle, and is there superheated at a low pressure. The object of the invention is to produce a cheap and simple apparatus by which steam may be generated rapidly and economically for the various uses of butchers and farmers, and by which a kettle may be heated by the steam at a very high temperature, but with a low pressure, so that the apparatus may be used with safety.

Figure 1 is a vertical central section through the middle of my complete apparatus; Fig. 2, a horizontal section of the same on the line *x x*; Fig. 3, a side elevation of the steam-generator, the kettle and the outside casing being removed; and Fig. 4, a top-plan view of one of the sets or sections of tubes.

a represents an upright cylindrical body, provided at its lower end with two lateral necks, *b*, one above the other. To the necks *b* there are secured two necks or head-pieces, *c*, to each of which there are connected three horizontal tubes, *d*, all of which are connected at their opposite ends to a single upright tube or manifold, *e*, the ends of which are closed, as shown in Figs. 1 and 2. In addition to this central series of tubes *d*, there are also side tubes *f*, arranged in sets or sections, each set or section consisting of six tubes, all of which are attached at one end to a single vertical tube or manifold, *g*, while their opposite ends are connected, three to one short tube or manifold, *h*, and three to another, as shown in Figs. 2 and 3. Any suitable number of these sections are placed side by side parallel with the tubes *d*, as shown. The short tubes or manifolds *h* are bolted to each other and to the sides of the heads *c*, and openings *i* made from one to another, as shown in Figs. 1 and 2, to per-

mit the circulation of the water between them; but between the long tubes or manifolds *g* there is no direct communication whatever. The tubular portion of the apparatus is surrounded by a shell or casing, *E*, provided at the bottom with a fire-grate, *F*, and at the top with an opening, *k*, to permit the escape of smoke, both the grate and the opening being arranged at the middle of the apparatus. The upper end of the body *a* extending above the tubes forms a steam-dome, the water never being maintained above the level of the tubes. In order to prevent water from being taken up with the steam, a plate, *m*, is secured in the body *a* at the water-line, as shown in Fig. 1. Between the upper and the lower series of tubes there are arranged two horizontal sliding plates, *n*, which may be moved out, as shown in Fig. 1, to permit the flames, smoke, &c., to pass up directly to the outlet *k*, or moved inward to the middle, so as to deflect the flame, &c., outward around them toward the ends of the tubes. Above the casing or jacket *E* there is mounted a hollow-walled kettle, *G*, surrounded by a casing or shell, *p*, into which the products of combustion from the generator are discharged through the opening *k*. The casing *p* is provided near its top with a pipe, *r*, through which the smoke passes to the chimney. A pipe, *s*, is connected from the top of the body *a* to the top of the hollow kettle-walls, while another pipe, *t*, is connected from the bottom of the kettle-walls to the body *a* just above the water-line, as shown in Fig. 1.

When the fire is started the steam generated in the flues passes through the necks *b* and accumulates in the top of the body *a* above the water-line. From the body it passes through the pipe *s* and fills the hollow walls of the kettle. As the temperature of the steam decreases it flows back, together with any water resulting from condensation, through the pipe *t*, into the body *a*, so that there is a continuous circulation of live steam through the walls of the kettle. The flame and waste products of combustion from the fire ascending through the opening *k* surround and act upon the kettle and superheat the steam in the walls thereof.

By thus superheating the steam when in the walls of the kettle I am enabled to keep

the steam in the generator at a pressure as low as fifteen pounds to the square inch, and at the same time to keep the steam around the kettle at as high a temperature as in the ordinary apparatus, using steam at the dangerous pressure of a hundred pounds or more. It will therefore be seen that by my construction I produce an apparatus which may be operated with perfect safety and with economy of fuel. Inasmuch as the apparatus is not required to withstand a heavy pressure of steam it can be made lighter, and consequently cheaper and more portable, than those designed for the usual heavy pressures. Ordinarily, the two sliders or dampers *o* are moved inward, so that the flame, &c., is deflected outward, but when steam is generated too rapidly the plates are moved outward and the flame allowed to ascend directly to the opening *k*. By using the sets or sections of tubes, as described, I am enabled to increase the capacity of the generator to any required extent by simply adding to the number of sections, so that I can produce a generator of any required capacity by the use of one set of patterns and tools, and can vary the size or capacity of the apparatus at any time by simply adding or removing sections.

Having thus described my invention, what I claim is—

1. The upright cylindrical body *a*, provided with the two necks *b*, in combination with the heads *c*, each provided with several tubes, *d*, and the vertical tube or manifold *e*, having the outer ends of all the tubes *d* connected thereto, as shown.

2. The combination of a steam-generator, a kettle heated by steam therefrom, and a jacketing or flue arranged to conduct the waste products of combustion from the generator around or through the kettle in such manner as to superheat the steam while in the kettle.

3. In combination with the steam-generator, the hollow-walled kettle *G*, surrounded by the casing *p*, through which the waste products of combustion are conducted from the generator, as shown.

4. In combination with the generator having the heads *c*, tubes *d*, and tubes or manifolds *e*, the sections consisting of tubes *f*, long tube or manifold *g*, and short tubes or manifolds *h*, constructed and arranged as shown.

5. In combination with the steam-generator, constructed as shown and described, the plates *o*, arranged as and for the purpose set forth.

VALERIUS D. ANDERSON.

Witnesses:

CHAS. R. CRAIN,
P. P. MAST.