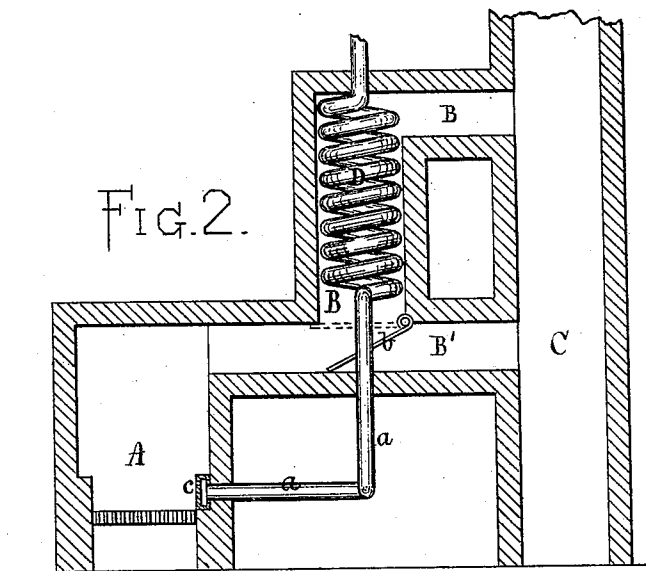
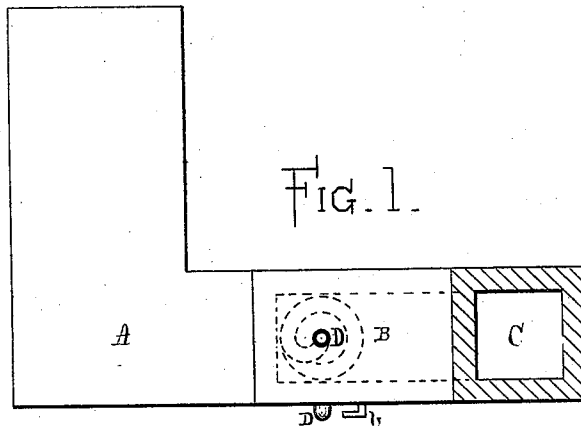


G. UPTON.
RENDERING APPARATUS.

No. 179,233.

Patented June 27, 1876.



Chas. F. Sleeper.
J. E. Knox

George Upton
by J. E. Maynard
his atty

UNITED STATES PATENT OFFICE.

GEORGE UPTON, OF PEABODY, MASSACHUSETTS.

IMPROVEMENT IN RENDERING APPARATUS.

Specification forming part of Letters Patent No. **179,233**, dated June 27, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, GEORGE UPTON, of Peabody, in the county of Essex and State of Massachusetts, have invented certain improvements in preventing the deleterious effects of noxious gases produced in rendering animal matter, of which the following is a specification, reference being had to the accompanying drawings, making a part hereof.

My invention relates to utilizing the waste heat from the furnace of the steam-generator, by causing it to heat the gases from the rendering-tanks, as these gases are led from the rendering-tanks to the fire, by which they are neutralized; and it consists in the combination of a heater with the flue of the furnace, this heater being in connection with the rendering tank or tanks, so that the gases pass through it from that tank, and also with the fire-box of the furnace, so that the heated gases from the heater shall pass into the fire.

In the drawings, A indicates the fire-box and B the flue of the furnace of any suitable steam-generator, through which flue the products of combustion from the fire-box escape, after passing through the tubes of the boiler, or otherwise giving up a large part of their heat to the water in the boiler. This flue B leads into the chimney C. In this flue B I place the heater D, which should have a large surface relatively to its cubical contents. The best form known to me is a coiled pipe, as shown in the drawings. The upper end of this heater is in connection with the rendering tank or tanks whose noxious gases are to be neutralized, and the lower end of it connected by the pipe *a* to the fire-box A.

When the heater is not in use it is desirable to prevent the access of the heated products of combustion to it, and for this purpose I usually mount it in an independent flue, having

a second flue, B', by which the products of combustion can escape into the chimney without passing over the heater, the damper *b* being so arranged that these products of combustion can be caused to pass at will through either the flue B or the flue B', all as clearly indicated in Fig. 1 of the drawings. This is an important feature of my invention, not only because the heater can thereby be saved from unnecessary exposure to heat, but also because the large flue B may be constructed with apertures, through which ready access may be had to the heater, these apertures being, of course, properly closed when the heater is in use.

The pipe *a* should end in a cross-pipe or receptacle, *c*, and the side of this receptacle next the burning fuel should have numerous apertures, through which the heated gases escape into the fire-box, and a current of air escaping with them may also be used with advantage; but this is no part of my present invention.

In practice, I usually build the flue B as an additional flue, (the flue B' in that case representing the usual flue,) for the reason that the flue in which the heater is placed should be enlarged, as otherwise its capacity will be diminished; and in most cases it is preferable to build a short flue especially for the heater, rather than to enlarge the usual flue.

What I claim as my invention is—

The combination of the heater D, the two flues B and B', and damper *b* with the fire-box A of the furnace, as and for the purposes specified.

GEO. UPTON.

Witnesses:

J. E. MAYNADIER,
B. A. DAVIS.