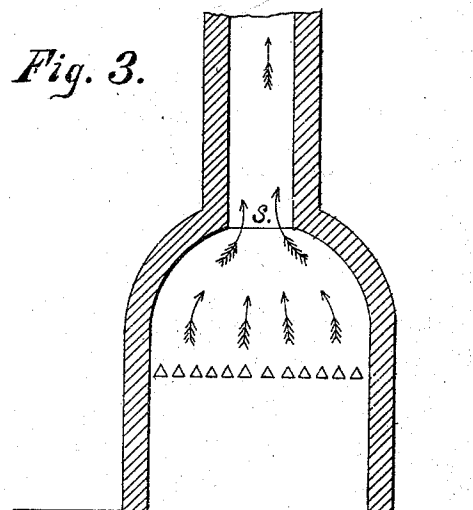
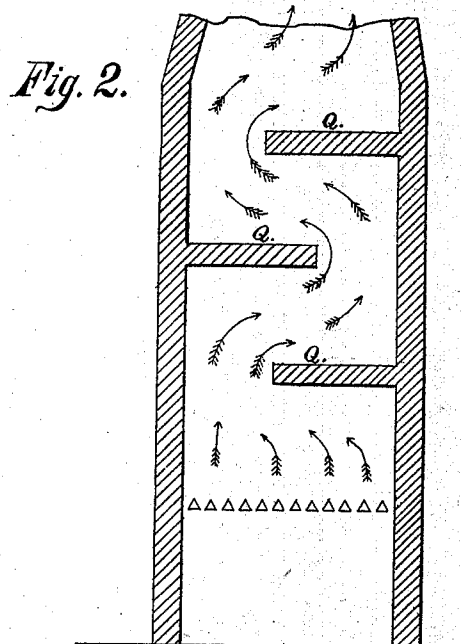
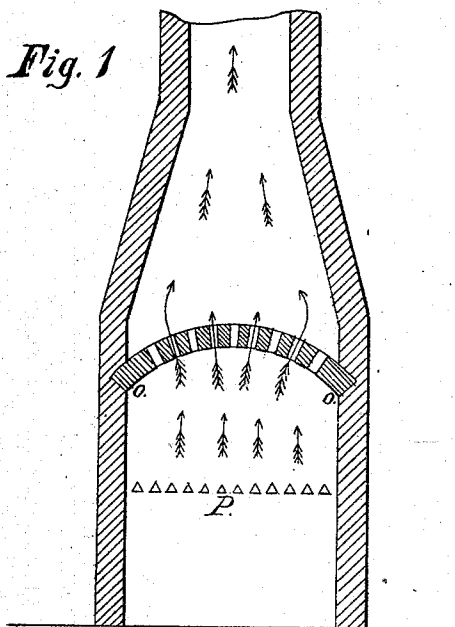


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Treating Gases and Vapors from Offal, &c.

No. 146,369.

Patented Jan. 13, 1874.



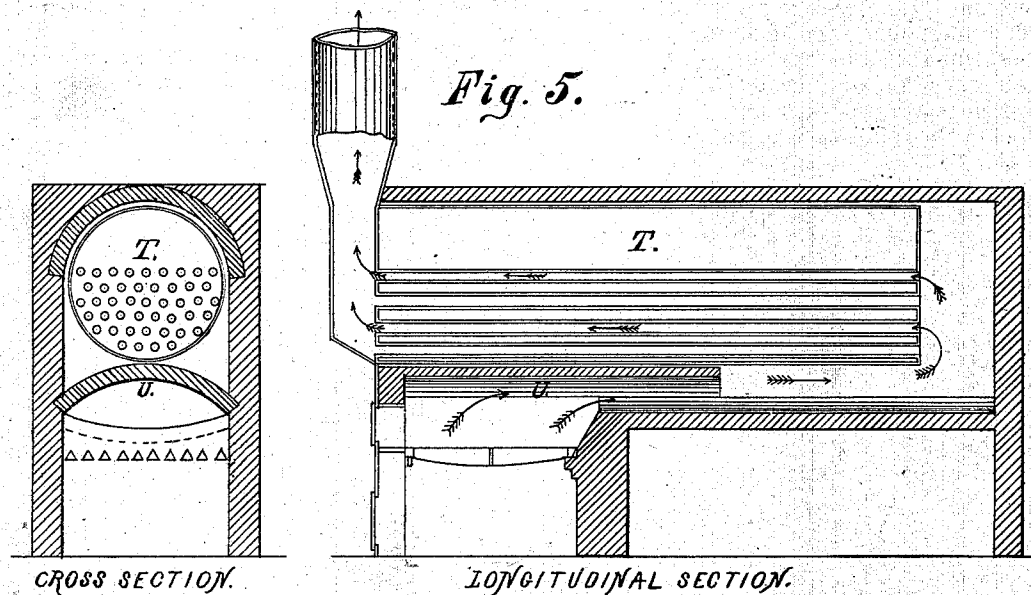
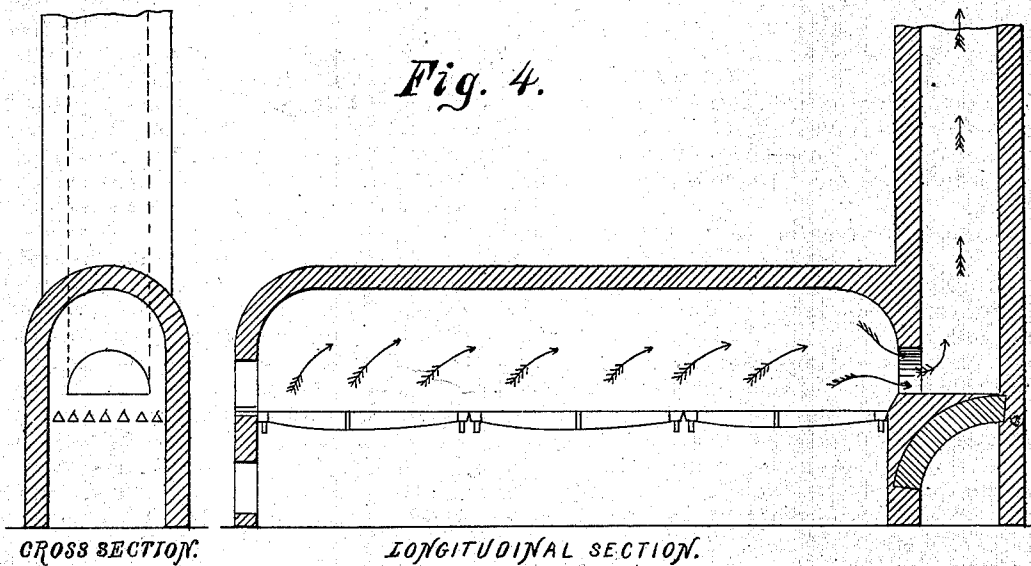
Oscar D. Perrigo.
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JACOB J. STORER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN TREATING GASES AND VAPORS FROM OFFAL, &c.

Specification forming part of Letters Patent No. **146,369**, dated January 13, 1874; application filed December 11, 1873.

To all whom it may concern:

Be it known that I, JACOB J. STORER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement for Deodorizing Offensive Gases and Steam, of which the following is a specification:

The object of my invention is to deodorize the steam and gases escaping from animal matter during the process of rendering it or of drying it for conversion into a fertilizer, or for other purposes.

In some packing, slaughtering, and rendering establishments, the tank steam and gases are conducted under the boiler-fires which generate steam for the said tanks or for other work in the establishment; but in these cases the conditions are such that rarely, if ever, is a thorough decomposition and deodorization of the gases and steam effected. The fires are rarely of sufficient capacity for the purpose, and the flame chamber or space between the fire-surface and boiler is too small for the steam and gases, which require ample room for complete decomposition and deodorization, while the boiler-surface absorbs heat so rapidly as to cool below the required heat that portion of them that passes through the fire unaffected, excepting as to temperature.

Another method designed to deodorize these gases and steam is to pass them through heated metallic tubular coils, and thence into a fire or fires. This method is attended with the serious disadvantage of rapid destruction of the coils by oxidation. In some instances the offensive steam and gases from drying-cylinders—cylinders used for drying animal matter for conversion into fertilizers—are passed into the boiler-fires which generate steam for the working of the cylinder, which is objectionable for reasons above given, while in other cases the steam and gases are conducted into the fires which heat the cylinder and its contents. In these last instances, also, the cylinder and its wet contents absorb heat so rapidly that the gases and steam escaping undecomposed through the fires and fire-places are, by contact with the cylinder, cooled below the temperature required for deodorization.

Lack of room for the combustion of the steam and gases, and of time for thorough work—

or, rather, of sufficiently long and complete exposure to the required temperature—are the invariable causes of failure, in all instances, to effect their thorough deodorization. By limiting the volume of escaping offensive gases and steam to the capacities of the boiler fire or fires under the drying-cylinder, complete deodorization may be effected; but, in practice, this rarely, if ever, can be done. To blow off steam from a rendering-tank slowly, in a volume not in excess of the decomposing capacity of the boiler-fires, would take so much time as to seriously interfere with the work of the slaughtering or rendering house.

To regulate the escape of offensive steam and gases from drying-cylinders to the decomposing capacity of the drying-fires requires a delicacy of manipulation which forbids its being termed a practical method, while the process requires so slow an escape of the gases and steam, and consequent slow drying of the animal matter, as to make it one of doubtful economy.

To insure the economical deodorization of offensive gases and steam generated by steaming, boiling, or drying animal matter, and to be able so to treat any large volumes of them that may escape from rendering-tanks or fertilizer-cylinders, and seeing, too, that the ordinary boiler and drying fires are almost invariably inadequate for the purpose, I have designed a combustion-chamber containing a fire specially adapted therefor, and which may be devoted wholly to this purpose. This chamber is built of refractory materials, preferably fire-brick, and the bricks from the base of curve O are so laid that interstices—say, of three or four inches square—are left between them all. It is, by preference, made dome-shaped for the better radiation of heat inward and downward. The heated gases and products of combustion and evaporation passing into this chamber there mingle and burn, their final decomposition and combustion being greatly assisted by their brief detention, caused by the surrounding brick-work and the radiation of heat therefrom. The resulting products pass inodorously, or deprived of offensive odor, out through the interstices. It is preferable to place this chamber in the bottom of a chimney of sufficient height and capacity to create a good draft, as shown

in the drawing in Fig. 1; but it may be constructed separate from the chimney and connected therewith by a flue. The chamber, to be in proper operating condition, should be at a bright-red or white heat. It may be quickly heated by fire placed on the grate shown at P, Fig. 1. Instead of the perforated roof, jutting shelves, as shown at Q in Fig. 2, may be arranged at a proper distance above the fire, to retard sufficiently the escape of the gases and to radiate heat upon them. Adjustable dampers or valves, or other substitutes, may also be used for this purpose—such, for instance, as a considerable narrowing of the exit, as shown at S, Fig. 3. The shape and size of the chamber may be adapted to its location and the amount of work it is intended to perform.

Another design for the deodorization of offensive gases and steam is to make them pass through a horizontal or inclined flue over a fire, as shown at Fig. 4.

It will be seen that my plan is to have a fire-place, combustion-chamber, or flue for the offensive steam and gases, which may be devoted solely to their decomposition and deodorization, and which shall be constructed of such shape and material that when heated there shall be, from all directions toward the central axis of the structure, radiation of heat sufficient to insure the desired results, while the steam and gases to be treated shall be retarded or retained therein long enough to receive the full effects of the heat.

In some instances I may find it of advantage to place a boiler over the roof or neck or at the exit end of the combustion-chamber, to utilize the escaping heat, or the heat and flame may be made useful for drying animal matter; but in no case do I apply the escaping heat and flame to any purpose until the offensive gases and steam are deodorized.

Another method designed by me is to pass

offensive steam and gases under a boiler, first building over the boiler fire-place a brick arch nearly in contact with the boiler-bottom, and extending, say, from four to ten feet, more or less, along its length, as shown in Fig. 5, where T is the boiler, U the arch. This arch prevents the contact of the gases and steam introduced into the fire-box with the heat-absorbing boiler-surface, and, becoming heated by the fire, presents a powerful heat-radiating surface sufficient for the deodorization of considerable volumes of offensive gases. It also, by its superior radiating effects, causes so complete a combustion of the solid fuel placed on the grate that no smoke escapes up the stack.

In all these instances the steam and gases to be treated may be introduced either under or over the fires.

Having thus described my process and apparatus, what I claim, and desire to secure by Letters Patent, is—

1. Fire-places, combustion-chambers, or flues provided with arches or radiating roofs and sides, so as to maintain a high temperature in the furnace, for the purpose of decomposing and deodorizing offensive vapors and gases, as set forth.

2. Fire-places, combustion-chambers, or flues provided with curved walls of refractory material, arranged to radiate toward the central axis of the structure, as described.

3. The combination of an arched furnace with flues leading on one side to apparatus used for treating animal matter, and on the other to a steam-boiler or other furnace, so as to both deodorize and utilize the offensive gases and vapors, as specified.

JACOB J. STORER.

Witnesses:

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