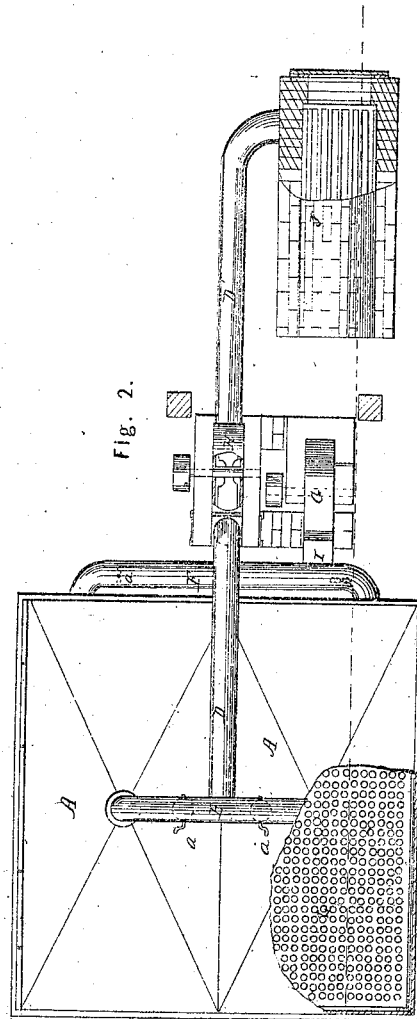
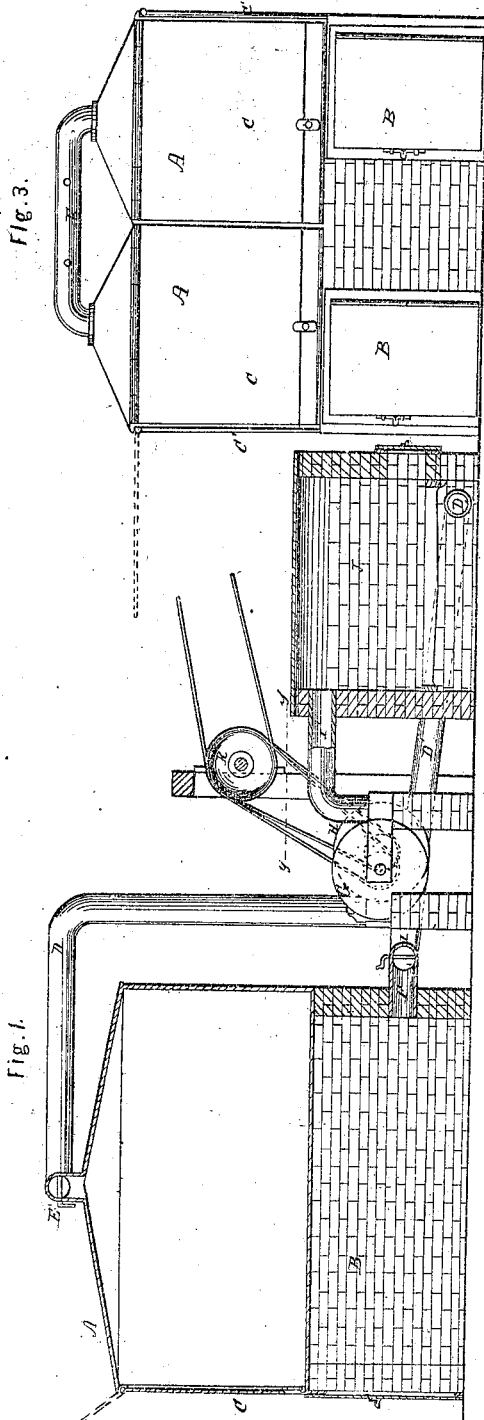


*A. & E. Lister*  
*Deodorizing Offal.*

*No 52,863.*

*Patented Feb. 27. 1866.*



Witnesses:  
*Wm. Brown*  
*Edw. Busch.*

Inventors.  
*A. & E. Lister*  
*By William A. Atty*

# UNITED STATES PATENT OFFICE.

ALFRED LISTER AND EDWIN LISTER, OF NEWARK, NEW JERSEY.

## IMPROVEMENT IN DEODORIZING OFFAL.

Specification forming part of Letters Patent No. 52,863, dated February 27, 1866.

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

Be it known that we, A. LISTER and E. LISTER, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Treating Offal; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of an apparatus made according to our invention, *x*, Fig. 2, indicating the line of section. Fig. 2 is a plan view, partly in section, on the line *y* of Fig. 1. Fig. 3 is a front view.

Similar letters of reference indicate corresponding parts.

The object of this invention is to purify and deodorize offal, both of organic and inorganic matter, and to get it in a condition fit to handle, in whatever manufacture or process it is afterward to enter; and it consists in drying and purifying the same by a new process in which offensive and noxious vapors and exhalations are removed or consumed by means of heat.

A A designate two independent chambers or ovens placed side by side, each being provided beneath with hot-air receivers B. The chambers A have each a front door, C, and a side door, C', such doors in this example being hinged along their upper edges, so as to expose, when they are raised, the whole interior of their respective chambers. The walls of the hot-air receivers and of the chambers and their partitions may be of brick or other suitable material.

The walls of both hot-air receivers are penetrated by the ends of an air-pipe, F, which is connected to a pipe, I, proceeding from an exhaust-fan, G. The pipe I connects the other end of the fan or blower to a furnace, J, and enters the fire or combustion chamber of said furnace. The fans are so set or so driven as that the fire-chamber of the furnace J will be exhausted by the fan G, while the same fan will produce a blast in the air-chambers B B through the branching pipe F, and that the offal chambers or ovens A A will be exhausted by the action of the fan H, which will force the vapors and gases exhausted by it from said ovens into or below the fire of the furnace J. The walls of both the chambers or ovens A

are likewise penetrated by the ends of a pipe, E, which is connected to a pipe, D, proceeding from a fan, H. The pipe D' connects the other end of the blower H to the ash-pit of the furnace J. This furnace J may be the furnace of a steam-boiler used to obtain power to drive machinery, or any other furnace.

The blowers or fans G H are driven from pulleys on a shaft, K, such pulleys being driven by any convenient means.

The bottoms L of the chambers or ovens A A are made of open work, consisting of perforated plates, wire netting or cloth, or of grated work, whose interstices should be numerous, so as to admit air and gases freely through them, but fine enough to prevent the solid matters of the charge of offal from passing down through the bottoms, one of said bottoms being seen in Fig. 2 through the broken cover of one of the chambers.

The mode of conducting our process of treating and deodorizing offal is as follows: The chambers or ovens A A are supplied with the proper charges of offal, distributed upon their bottoms L, and their side and front doors, C C', are then closed. The joints of the doors should be packed or otherwise made tight, so that the ovens A and air-chambers B are shut and closed to the external air. Motion being given to the fan-blowers G and H, the products of combustion and hot air in the furnace J will be drawn off by the action of the fan G into the pipe I, through the pipe T into the branching pipe F, whence they will be discharged into the air receivers or chambers B. At the same time the action of the fan H will exhaust air, gas, and vapor from the ovens A A through the branching pipe E into pipe D, and through the fan H and pipe D' into the furnace J below its grate, so that the said gases and vapors shall be brought into contact with the fuel on such grate.

The furnace J may be an independent furnace, or it may be the furnace, or one of them, used to raise steam to drive the fans and any other machinery to which motion is to be given. The combustion-chamber and ash-pit of such furnace J should be closed when the blowers are in operation.

More than one furnace may be connected with the blowers, and the same blowers may also serve a larger number of ovens A by ex-

tending the pipes E and F, provision being made for the increased duty by enlarging the fans or increasing their speed.

The heated air and products of combustion which are forced into the receiving-chambers B B become somewhat compressed by reason of the force with which they are driven into the said chambers, and since the action of the fans is simultaneous, the ovens or chambers A A will be partially exhausted of the air, vapor, and gas therein, and the said heated air and products of combustion will be forced up through the mass of offal on the whole extent of the perforated plates, agitating and heating the said mass and driving off therefrom its moisture and noxious properties in the condition of vapor and gas. Such vapor and gas are accelerated in becoming separated from the mass by the exhaust which is continually taking place in the upper part of the offal chambers or ovens A, and they are carried upward from said ovens into pipe E, and thence through pipe D, blower H, and pipe D' into the fire in the furnace J, where such of them as are inflammable are consumed, while those which are not inflammable are yet deprived of their noxious or of their offensive properties by new combinations which they form with the products of combustion, or they become changed in character by the action of the heat to which they are subjected.

The pipe D' from the blower H enters the ash-pit of the furnace in the forward part thereof, and the air, vapors, and gases forced through it act as a blast to the fire, thereby imparting energy to the same and supporting combustion at the same time that they become consumed or changed in character through the action of the fire, as set forth.

The products of combustion and heated air which continually flow toward the upper part of the furnace are constantly drawn thence by the action of the fan G and driven into the receivers B, whence they pass in fine divided currents through the perforated bottom plates, L, into and through the charges of offal lying therein, which, becoming highly heated from intimate contact with such air and products of combustion, are caused to part with their moisture and are brought more and more to a condition of dryness, their noxious and offensive properties passing off through the exhaust-fan

H to the furnace to be destroyed. The continuation of this treatment causes the offal to become purified and deodorized as well as dry, so that it may be handled without danger to health and without offending the senses with bad odors.

It will be observed that our process is carried on without driving the noxious and offensive vapors and gases of the offal into the external air, and that so fast as they are driven off from the mass they are carried into the fire and destroyed or changed in their character.

The branching pipes E and F are provided with dampers or valves, which enable the operator to shut off the ovens A and air-receivers B from the action of the fans, and it results from this arrangement of valves, and from the separation of the ovens A A one from the other, and from the like separation of the receivers B one from the other, that when discharging one of the ovens and supplying it with a fresh charge such oven and its receiver can be closed to the action of the fans, while the other oven and its receiver continue to be subjected thereto. In this manner the ovens A A can be charged in alternation and the operation be carried on without interruption, care being taken to cut off communication by means of the dampers *a* from the oven which is opened.

We claim as new and desire to secure by Letters Patent—

1. Treating offal for the purpose of utilizing it according to the process above set forth—to wit, subjecting the offal to currents of hot air and gases in closed chambers and at the same time discharging into the furnace which supplies such currents the gases, vapors, and exhalations which are driven off from the offal, substantially as shown.

2. The arrangement, substantially as above shown, of ovens, air-receiving chambers, and pipes leading into and out of the same, with or without a system of fans, to quicken the circulation of the ingoing and outgoing air and gases.

The above specification of our invention signed by us this 10th day of July, 1865.

ALFRED LISTER.  
EDWIN LISTER.

Witnesses:

EDWD. BRYAN,  
JOHN E. BURROWS.