

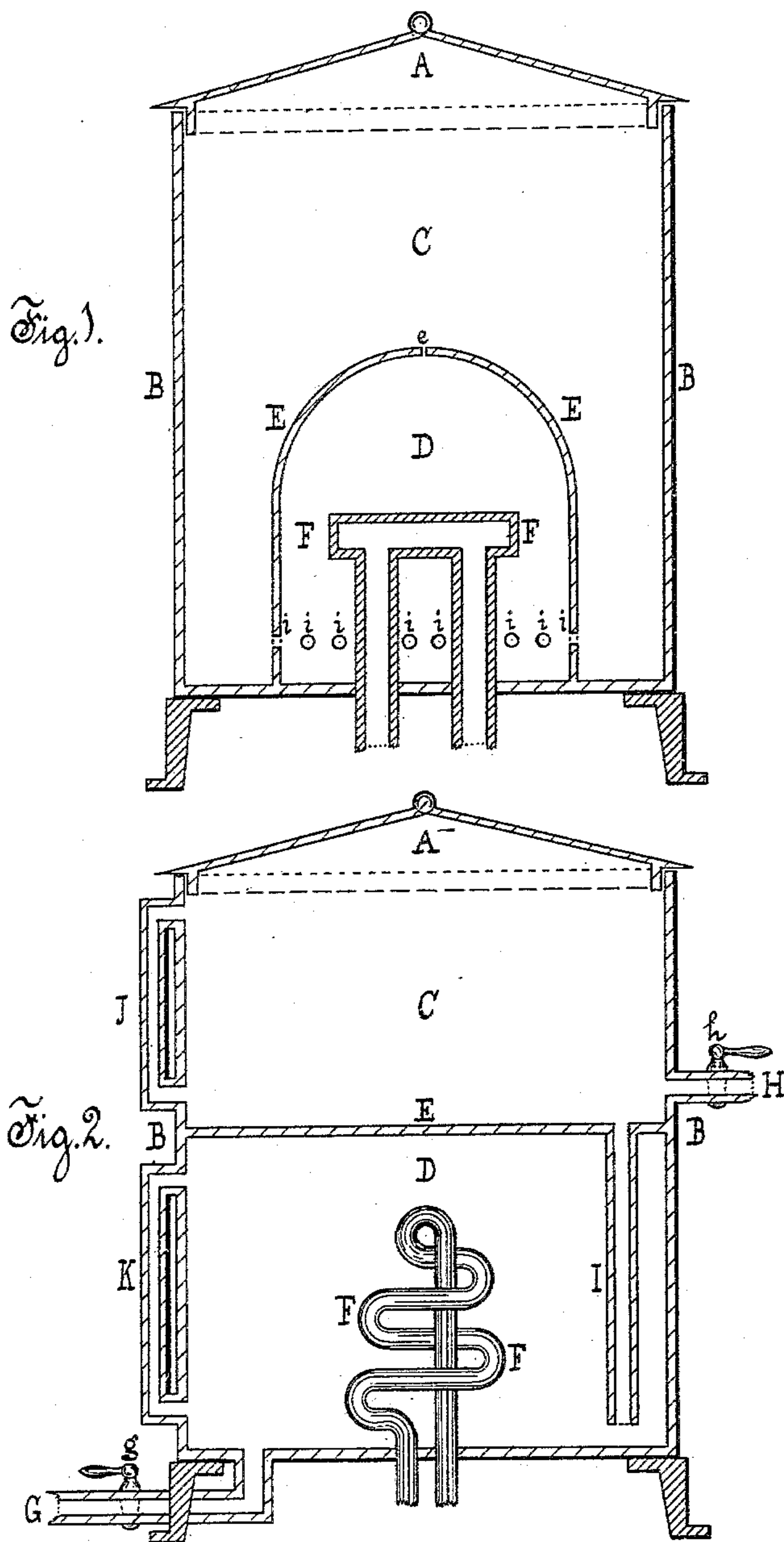
(No Model.)

R. E. DEANE.

AUTOMATIC STEAM HEATER OR BOILER FOR CULINARY AND OTHER  
PURPOSES.

No. 384,348.

Patented June 12, 1888.



Witnesses:

*Frank H. H. H.*  
*Edmund D. H. H.*

Inventor:

*Royal E. Deane,*  
by his Attorney,  
*Rollin M. Morgan*



# UNITED STATES PATENT OFFICE.

ROYAL E. DEANE, OF NEW YORK, N. Y.

AUTOMATIC STEAM HEATER OR BOILER FOR CULINARY AND OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 384,348, dated June 12, 1888.

Application filed June 17, 1887. Serial No. 241,639. (No model.)

*To all whom it may concern:*

Be it known that I, ROYAL E. DEANE, of the city, county, and State of New York, have invented a certain new and useful Automatic Steam Heater or Boiler for Culinary and other Purposes, of which the following description is in such full, clear, and concise terms as to enable any one skilled in the art to make and use the same, reference being had to the accompanying drawings, illustrative thereof, wherein like letters of reference indicate corresponding parts.

My invention contemplates a boiler or heater for culinary and other purposes, heated by steam or hot air in a pipe, coil, or annular, so located and surrounded that constant circulation is straightway started and continued automatically, whereby the temperature is constantly maintained practically at the boiling-point without the necessity of "blowing off" excessive steam or requiring any safety-valve.

Figure 1 shows a central vertical section of such a boiler, and Fig. 2 shows similarly a modification.

It is obvious that in horizontal section the boiler may be made square or round or of any other shape desired.

My apparatus consists, essentially, of a boiler, B, and removable cover A, of ordinary construction, containing a smaller compartment, D, within, which is substantially steam-tight, and into which steam heat is introduced by an ordinary annular, F F, as shown in Fig. 1, or by a suitable steam-coil, as shown and similarly lettered in Fig. 2, or by any other well-known means for such purpose. In the sides of this smaller compartment, D, and near the bottom, are a series of orifices, (lettered *i*,) acting as both inlets and outlets, according to circumstances hereinafter mentioned. In the top of this compartment D may or may not be placed an orifice, *e*, for an air-vent, as such renders the practical operation of the apparatus more instantaneous without rendering the compartment insufficiently steam-tight to accomplish the automatic action described later. Gages may be added for determining the quantity of water or other liquid drawn off or supply remaining in the usual way, and the boiler may be filled from the bottom, sides, or top in any of the many well-known ways, and

water or other liquids used may be taken out from the bottom, sides, or top likewise.

The operation of the apparatus is as follows, supposing it to be supplied with water or other liquid and heat somehow as described above: As the water becomes heated, steam is generated, which by its expansive power forces the water or other liquid in the compartment D downward and outward through the orifices *i*, acting as outlets, until the surface of the water or liquid is forced below the annular or coil, whereupon condensation occurs and the water or liquid flows back through the same orifices, acting as inlets, until it rises around and above the annular or coil, when it is again forced downward and outward, as before described, until condensation occurs again, and the same action is repeated, and the circulation thus becomes constant and automatic.

The apparatus shown in Fig. 2 is a modification somewhat more elaborate, and consists, substantially, of a boiler, B, having two compartments—an upper, C, and lower, D, the latter substantially steam-tight—separated by a partition or diaphragm, E, but connected by a pipe, I, entering the upper compartment through its bottom E, as shown, or the outside near the bottom, and extending downward nearly to the bottom of the lower compartment, D, into which water or other liquid is introduced by the supply-pipe G, regulated by cock *g*, in the ordinary way. The compartment D is furnished with some heating device, such as hot-air or steam coil F, as shown, or by an ordinary steam-annular or other means well known to the art. The compartment C has outlet-pipe H, regulated by cock *h*, as usual, for drawing off the water or liquid or supplying a properly-connected contiguous vessel. This connection may be made at upper part or elsewhere to suit exigencies. Gages J and K are furnished to indicate the height of the respective bodies of water or liquid. A cover, A, is also provided, loosely fitted.

The operation is as follows: The water or liquid is supplied to lower compartment, D, and rises above the heated steam-coil F, and stands at an equal height in the pipe I. When heated to the boiling-point, steam is generated between the surface of the liquid and the diaphragm E. As the steam-pressure in-



creases, the liquid, and only boiling liquid, is forced upward through the pipe I into the upper compartment or reservoir, C, by the expansive power of the accumulated steam.

5 The process continuing, boiling liquid may be forced over into a connected contiguous vessel or drawn off in the ordinary way. The gage J will indicate the amounts drawn off and remaining. Given a certain quantity of liquid  
10 in the lower compartment or boiler, D, and the heat constant, the boiling liquid will gradually be forced into upper compartment or reservoir, C, until the surface of the liquid is forced below the steam coil, when the operation ceases of itself, because of the ensuing  
15 condensation, whereupon the liquid falls back and the operation is repeated, as above described. It is obvious that the connecting-pipe I must extend below the steam coil, and  
20 that there must be sufficient space between the latter and the diaphragm above for the purposes of particular boilers. Instead of a horizontal division, as shown, that division may be perpendicular with merely mechanical  
25 alterations.

The chief practical advantages of an apparatus constructed and operating substantially

as described lie in saving fuel, obviating the necessity of blowing off noisily surplus steam, and dispensing with valves.

What I claim as novel, useful, and as my invention is—

1. A heater for culinary or other purposes, consisting of two chambers, one within the other, the walls of the inner provided with  
35 orifices or openings into the outer chamber, in combination with a heating apparatus located within the inner chamber above said openings, in the manner and for the purpose substantially as specified.

2. A heater for culinary or other purposes, divided by a partition into two compartments communicating with each other by one or more  
40 orifices or openings located near the bottom of the compartment containing the heating apparatus, in combination with said heating apparatus situated therein above said orifices  
45 or openings, in the manner and for the purpose substantially as specified.

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