

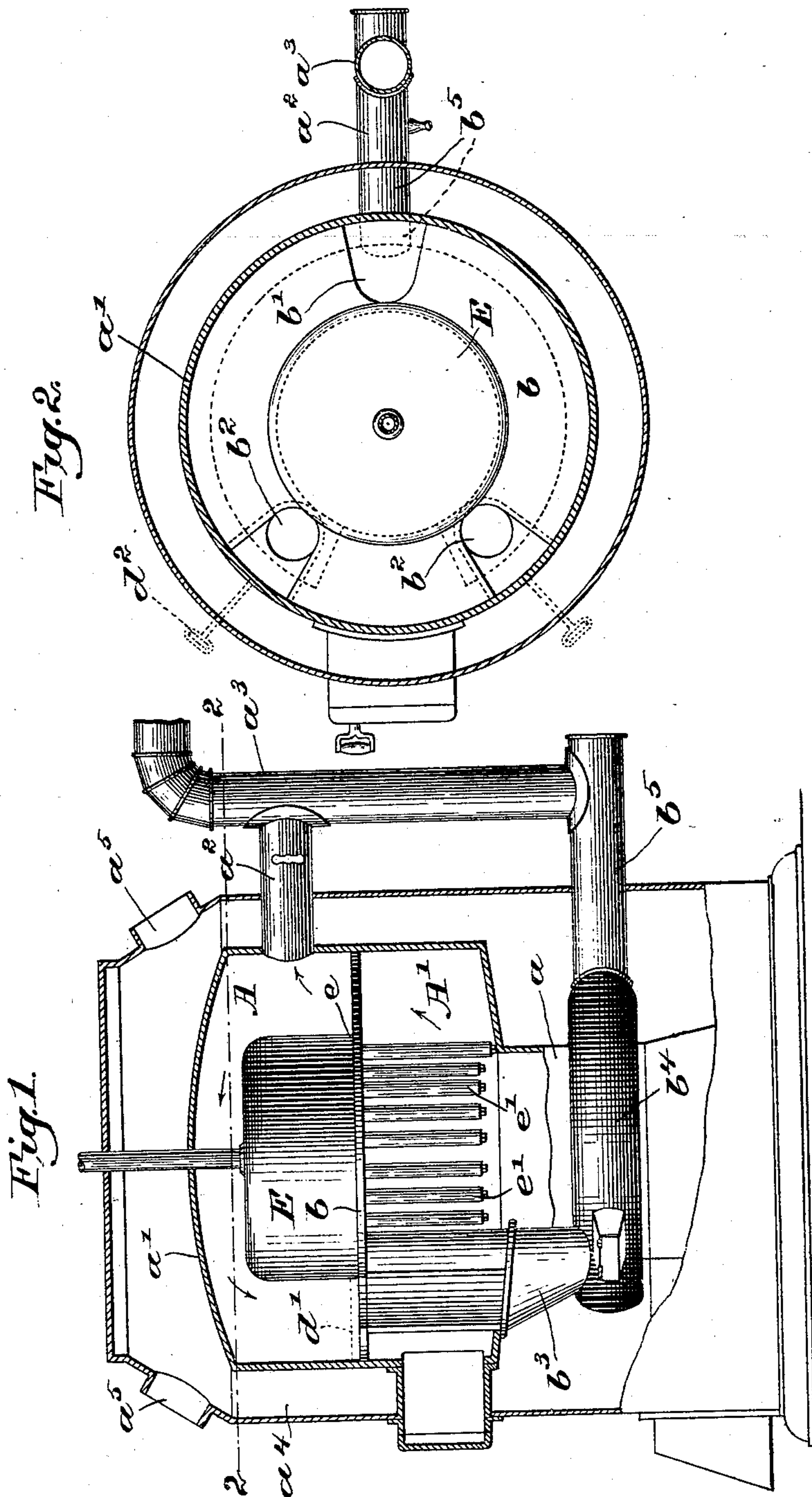
No. 624,189.

Patented May 2, 1899.

J. DEMAREST.
COMBINED STEAM AND HOT AIR HEATER.

(Application filed Feb. 13, 1899.)

(No Model.)



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN DEMAREST, OF MALDEN, MASSACHUSETTS.

COMBINED STEAM AND HOT-AIR HEATER.

SPECIFICATION forming part of Letters Patent No. 624,189, dated May 2, 1899.

Application filed February 13, 1899. Serial No. 705,368. (No model.)

To all whom it may concern:

Be it known that I, JOHN DEMAREST, of Malden, county of Middlesex, and State of Massachusetts, have invented an Improvement in a
5 Combined Steam and Hot-Air Heater, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 My invention is an improved heater relating to that class in which hot-air and water systems are combined in one heater or furnace.

My invention relates to improved means for
15 directing the products of combustion about the heater for the purpose of obtaining the greatest amount of heat therefrom and to the best advantage; and to this end I mount the water boiler or heater on a horizontal baffle-
20 plate extending across the dome of the heating-chamber, the baffle-plate thus dividing the dome into independent upper and lower portions, access from one to the other being provided through the baffle-plate adjacent
25 the direct smoke-outlet pipe only, and at some portion of the baffle-plate remote therefrom I provide the indirect passages or outlets for the smoke.

The details of construction of my invention
30 will be more fully pointed out in the course of the following description, reference being had to the accompanying drawings, illustrative of a preferred embodiment thereof, and the invention will be more particularly pointed
35 ed out in the appended claims.

In the drawings, Figure 1 is a central vertical sectional view, partly broken away, showing the general construction of my improved
40 furnace or heater. Fig. 2 is a horizontal cross-section taken on the line 2 2, Fig. 1.

It will be unnecessary for me to herein describe all the details of construction of the furnace, inasmuch as they may in general be
45 such as are commonly employed in this class of heaters and will include a fire-pot a , dome a' , having a direct outlet-flue or smoke-passage a^2 , leading into the smoke-pipe a^3 , and all inclosed in a usual casing or jacket a^4 , to
50 a^5 in usual manner. Within the dome a' I mount the hot-water or steam generator, preferably employing for this purpose a drop-tube

boiler E of the kind shown in my Patent No. 539,978, dated May 28, 1895.

The boiler E has an overhanging or projecting edge e , which rests on a diaphragm or
55 baffle-plate b , constituting the leading feature of my invention. This baffle-plate extends horizontally from side to side of the dome a' , dividing the latter into an upper portion A
60 and a lower portion A'. The baffle-plate is provided with an opening b' at its rear side immediately beneath the inlet end of the smoke-flue a^2 , and this is the only passage for the
65 smoke through the baffle-plate from the chamber A' to the upper chamber A, so that while the drop-tubes e' of the boiler are always subjected to the heated products of combustion
70 passing through the chamber A' it will be understood that when the damper d in the flue a^2 is open the smoke passes directly from the chamber A' through the opening b' and out
75 through the flue a^2 and up the chimney without heating the dome a' to any great extent; but when it is desired to heat the dome, and
80 thereby produce a large volume of hot air for circulation through the hot-air flues of that part of the heater system, I close the damper d and compel the products of combustion to
85 pass in the direction of the arrows beneath the top of the dome and around the body of the boiler E to the front part of the baffle-plate, where the latter is provided with flues
90 b^2 , shown as two in number, one at each side, these flues leading down through the chamber A' and terminating in elbows b^3 at the
95 ends of a usual radiator-flue b^4 , which connects at its rear end by means of a flue b^5 with the smoke outlet or pipe a^3 .

A prime object of my invention is to make
100 it easy to control the heating effects of the furnace, so that the water may be heated as desired and the hot air may be provided to such extent as required, and the latter can to
105 a large degree be regulated independently of the former.

Under certain conditions it is desirable to further control the direction of the products of combustion, and accordingly I provide regulators, shown as slide-dampers d' , operated
110 by handles d^2 , which are arranged to close the openings b^2 of the baffle-plate. Thus if it is desired to cause the products of combustion to follow one path and to stay in the

chamber A for a longer time one of the openings b^2 will be closed, thereby compelling all the smoke to find its outlet through the other opening, or if it is simply desired to prevent the escape of the smoke rapidly, while yet permitting it to circulate throughout the full extent of the indirect flues, both dampers d' will be closed partially only, and if it is found that for any cause the smoke does not flow through one opening b^2 the other one may be temporarily closed until the circulation through the first opening has been established.

I am aware that hot-water or steam boilers and hot-air systems have been combined in one heater and that a baffle-plate has been interposed in order to direct the products of combustion in various ways, but so far as I am aware it is new to interpose a diaphragm or substantially horizontal baffle-plate or separating-wall, such as I have shown at b , whereby the dome is separated into two compartments—upper and lower—and the smoke may be compelled to envelop the boiler and pass out through the outlets b^2 or escape directly into the smoke-stack, if preferred. The manner in which I support the parts is also of considerable practical importance in my invention, it being observed that the baffle-plate rests on the vertical outlet-flues at b^2 and the water-boiler rests on the central opening of the baffle-plate.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A heater, comprising a heating-dome and a water-boiler, said dome being divided into upper and lower compartments by an intermediate baffle-plate extending from side to side thereof, and said water-boiler being centrally supported within said dome on said

baffle-plate, a direct outlet-flue leading from said dome above the baffle-plate and the baffle-plate having an opening immediately below said flue, the heater having indirect outlets for the products of combustion and flues connecting from said indirect outlets through the front part of said baffle-plate with said upper compartment, substantially as described.

2. A combined hot air and water heater, comprising a heating-dome having a water-boiler centrally located therein, a substantially horizontal baffle-plate surrounding said water-boiler and separating said heating-dome into upper and lower compartments, an opening through said baffle-plate at its rear side affording communication between said compartments, a smoke-outlet adjacent said opening for the direct escape of the smoke, and an outlet-flue through the front part of the baffle-plate for the indirect escape of the smoke, substantially as described.

3. A combined hot air and water heater, comprising a heating-dome having a water-boiler centrally located therein, a substantially horizontal baffle-plate surrounding said water-boiler and separating said heating-dome into upper and lower compartments, an opening through said baffle-plate at its rear side affording communication between said compartments, a smoke-outlet adjacent said opening for the direct escape of the smoke, and a plurality of outlet-flues, and regulators for said outlet-flues, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN DEMAREST.

Witnesses:

GEO. H. MAXWELL,
GEO. W. GREGORY.