(No Model.) 2 Sheets—Sheet 1.

T. R. CHASE.

WATER HEATER AND CIRCULATOR.

No. 369,043. Patented Aug. 30, 1887.

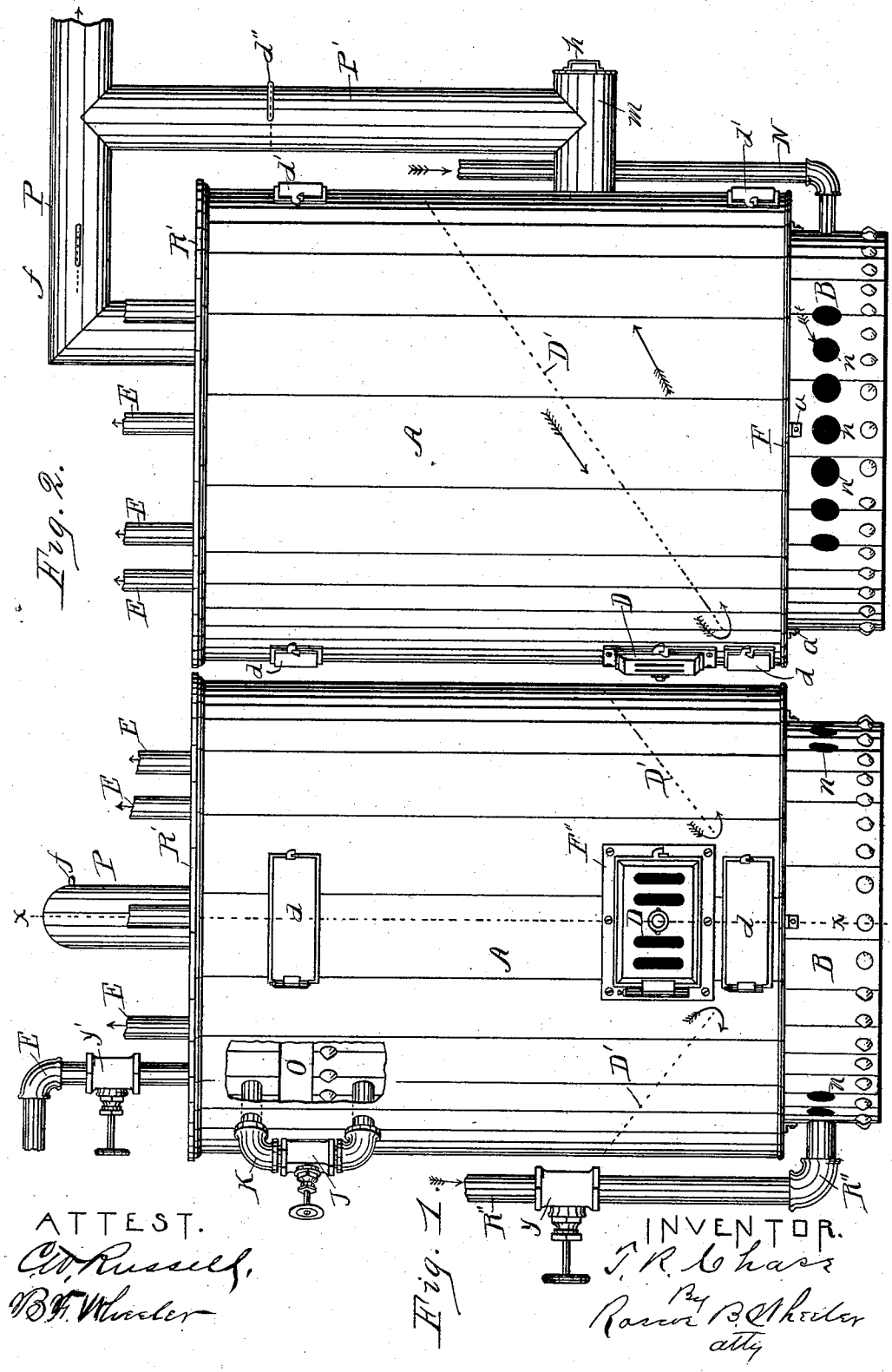

Fig. 2.

Fig. 1.

ATTEST.

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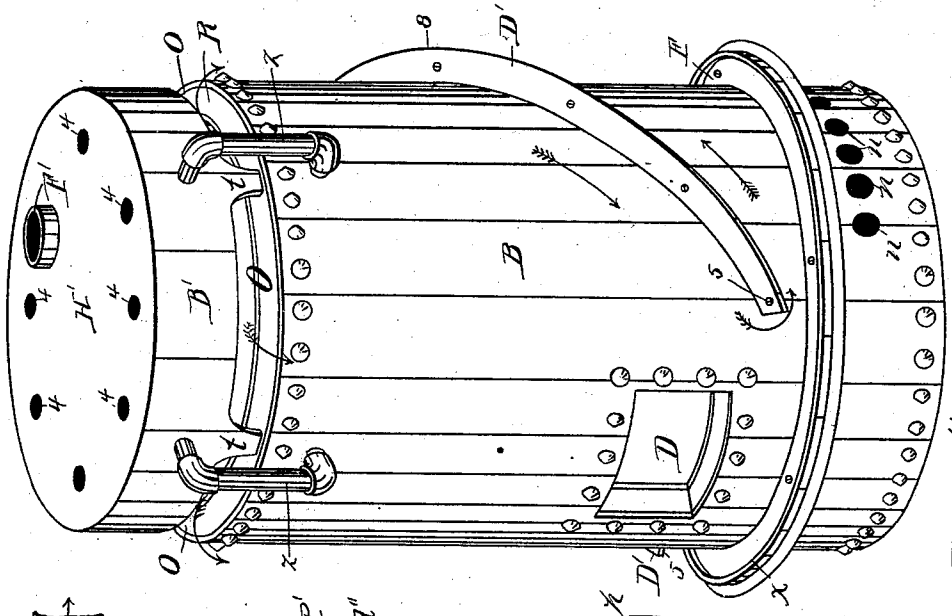

Fig. 4.

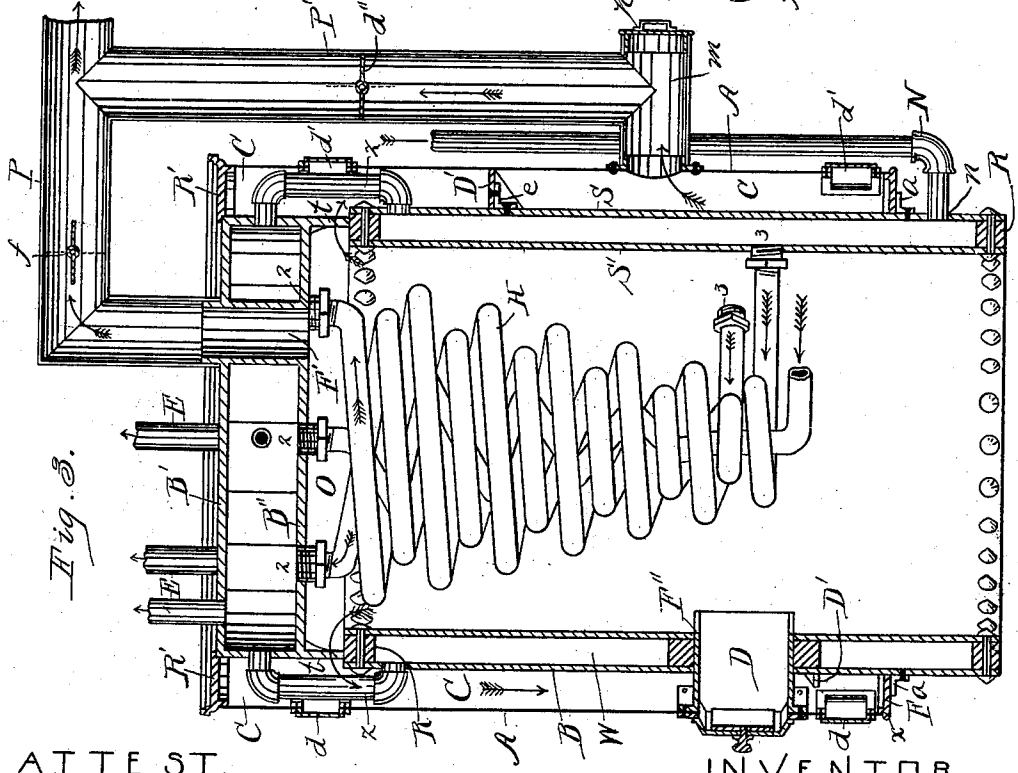

Fig. 3.

ATTEST.

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UNITED STATES PATENT OFFICE.

THEODORE R. CHASE, OF DETROIT, MICHIGAN.

WATER HEATER AND CIRCULATOR.

SPECIFICATION forming part of Letters Patent No. 369,043, dated August 30, 1887.

Application filed April 16, 1887. Serial No. 235,108. (No model.)

To all whom it may concern:

Be it known that I, THEODORE R. CHASE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Water Heaters and Circulators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to that class known as "water heaters and circulators."

The object of my invention is to construct a heater that will be durable, cheap to construct, and possess a large heating and circulating capacity, being designed for warming residences, hotels, and public buildings; and my invention consists in the construction of the boiler with heating and circulating pipes, manner of connecting said pipes with the water-space of the boiler and the water-space of the water-tank located over the upper end of the boiler, and the inclosing-jacket, and means for obtaining a direct or return draft, all of which will be hereinafter set forth, and pointed out particularly in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of the device embodying my invention. Fig. 2 is a side elevation of same. Fig. 3 is a vertical central section taken on dotted line *x x* of Fig. 1, looking toward the left, the coiled pipes not in section. Fig. 4 is a perspective of the boiler and water-tank, showing the jacket-supporting ring and inclined circular ledge nearly surrounding the boiler.

As indicated in the drawings, B represents the boiler, having an outer shell, S, and an inner shell, S', with interposed ring R at the top and bottom, and W represents the water-space, all of which are in common use.

B' represents a circular water-tank or auxiliary boiler, the circumference of which is about the same as the boiler B. Said tank is provided with a series of legs, *t*, which have a bearing on the upper ring R of the boiler. The legs *t* project below the under face of the bottom B'' of the water-tank, thus forming openings or hot-air passages O between the upper end of the boiler and the bottom of the water-tank.

F' is a smoke-flue passing through the tank B'.

Z represents a series of pipes coupling the water-space of the boiler to the water-space of the tank or auxiliary boiler B'.

D' is a ledge or deflector, which I attach to the outer face of the boiler B by means of supports or brackets *e*. (See Fig. 3.) At the back of the boiler it is located slightly below the top, being inclined as it passes around the boiler toward the front, its ends 5 terminating at a slight distance from the door or fuel-opening D and slightly below said opening, as shown in Fig. 4.

F is an annular flange encircling the boiler B, and is firmly attached thereto, passing horizontally around the boiler, being located below the ends 5 of the ledge D', and has on its upper face the annular shoulder X.

H represents a series of coiled pipes. The upper end of each pipe at 2 is coupled to the water-space of the auxiliary boiler B'. Their lower ends are coupled to the water-space W of the boiler B through the inner shell, as shown at 3. (See Fig. 3.)

A is a sheet-metal jacket, which I make sufficiently large to encircle the boilers B B', and to pass freely over the coupling-pipes Z Z and the ledge D', its lower edge fitting over the shoulder X and resting on the annular flange F, whereby said jacket is supported. (See Figs. 3 and 4.) The upper end of the jacket terminates on a horizontal plane with the head H' of the auxiliary boiler B'; and R' is a ring or cap fitting over the upper end of the jacket, its inner periphery being attached to and surrounding the periphery of the head of the auxiliary boiler, as shown in Fig. 3.

C is an annular chamber surrounding the auxiliary boiler and the boiler B. When the jacket A is in the position shown in Figs. 1, 2, and 3, the outer periphery, 8, of the deflector D' meets the inner face of said jacket, thus forming a cut-off, for the purpose hereinafter set forth.

In the front of the jacket I locate two doors, *d d*, one near the top, the other below the feed-door at the bottom of the jacket, and on the opposite side of the jacket I locate two like doors, *d' d'*. The upper doors are to enable the removal from the upper end of the boiler B of any ashes or soot collecting thereon. The

lower doors *d d'* are to enable a like removal from the upper face of the annular flange F.

The frame F'' of the feed-door is attached to the jacket A, and passes through the chamber C and feed-door opening D of the boiler B. (See Fig. 3.)

P is a smoke-pipe having one end coupled to the smoke-flue F', the other end being adapted to enter a chimney or smoke-stack; and *f* is a damper located in the smoke-pipe P.

m is a pipe attached to the back face of the jacket A, opening into the annular chamber below the deflector D', having on its free end a detachable cap, *h*, to enable the removal of ashes from said pipe; and P' is a vertical pipe coupled to the pipes P and *m*, having a damper, *d''*, located therein. (See Figs. 2 and 3.)

K is an auxiliary water-pipe, one of its ends being coupled to the auxiliary boiler B', crossing the chamber C, the other end being coupled to the boiler B, also crossing said chamber, as shown in Fig. 1. Said auxiliary pipe is provided with a valve, J, located outside of the jacket A, as shown in Fig. 1. I have shown one of such couplings, but may employ several.

To warm the apartments of a building, I couple to the openings 4 in the head of the auxiliary boiler a series of hot-water-distributing pipes, E, each pipe passing to an apartment to be warmed, being coupled to a suitable radiator or series of coiled or circulating pipes, which I do not show, as such will be readily understood by those skilled in the art. The water is returned from each radiator through a pipe, R'', entering at the bottom of the boiler B through an opening in said boiler, as shown in Fig. 1, below the jacket A. The return-pipes R'' are each provided with a valve or cut-off, Y. The feed-pipes E are also provided with a valve, Y', as shown in Fig. 1, whereby the flow of hot water to any apartment may be regulated or cut off when not wanted. The arrangement of these valves in a hot-water-circulating system is in common use.

N represents the feed-water-supply pipe, which enters the boiler B at the bottom, the opposite end being adapted to connect with the cold-water supply of a building. The water of the boiler B passes through the series of coiled pipes H, passing into the auxiliary boiler B' at the bottom, as indicated by arrows in Fig. 3. When the dampers *f d''* are turned as shown in Fig. 3, the heat and smoke escape through the smoke-flue F' in the auxiliary boiler out through the pipe P, thus forming a direct draft; but to obtain a better heating capacity the dampers *f d''* should be turned to the dotted position shown in Fig. 3, when the hot air passing out at the top of the boiler B will pass along under the bottom of the auxiliary boiler, through the passages O, downward to the deflector D', thence along said deflector to the front of the boiler, passing under the lower ends, 5, of said deflector, around the boiler below said deflector, and, rising slightly, passes out through the pipes *m* P', as clearly indicated by arrows in Fig. 3, thus making a rapid heater.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device for the purposes specified, the combination of the upright boiler B, the auxiliary boiler B', located over the upper end of the boiler B, a series of coiled pipes located in the upright boiler, said pipes having communication with the water-space of said boilers, the smoke-flue passing through the auxiliary boiler, the encircling jacket, the smoke-pipes coupled to the auxiliary boiler and inclosing-jacket, the dampers, and the deflector located between the upright boiler and the inclosing-jacket, as and for the purposes specified.

2. In combination with the upright boiler having an inner and an outer shell with water-space between them, the auxiliary boiler mounted thereon having the legs or supports *t*, the smoke-flue passing through said boiler, the series of coiled pipes having their lower ends coupled to the water-space through the inner shell of the upright boiler, their upper ends having a like coupling to the bottom of the auxiliary boiler, the auxiliary couplings Z Z, the inclosing-jacket, the smoke-pipes and dampers, and one or more circulating-pipes leading from the auxiliary boiler to an apartment radiator or radiators, and a pipe or pipes leading therefrom to and entering the upright boiler below the jacket, substantially as and for the purposes specified.

3. In combination with the upright boiler B, the auxiliary boiler B', its legs *t* resting on the ring R of the upright boiler, and one or more coiled pipes located in the upright boiler having connection with the water-space of said boilers, the flue F', passing through the auxiliary boiler, the jacket A, having the rings F and R', the deflector D', and auxiliary couplings Z Z, located in the annular chamber C, the coupling-pipe K, with valve, said pipe passing through the jacket and having communication with the water-space of the boilers, the smoke-pipes coupled to the auxiliary boiler and the jacket, and the dampers *f d''*, as and for the purposes specified.

4. In combination with the main and auxiliary boiler, constructed as set forth, having water communication with each other, the deflector D' and annular flange F, mounted on the main boiler, the inclosing-jacket having the top ring, R', and the doors *d d* at the front, with like doors, *d' d'*, at the back, the pipe coupled to the flue of the auxiliary boiler, the pipe *m*, attached to the jacket, having the removable head *h*, the pipe P', coupled to the pipes P and *m*, and dampers located in said pipes, as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

THEODORE R. CHASE.

Witnesses:
C. W. RUSSELL,
R. B. WHEELER.