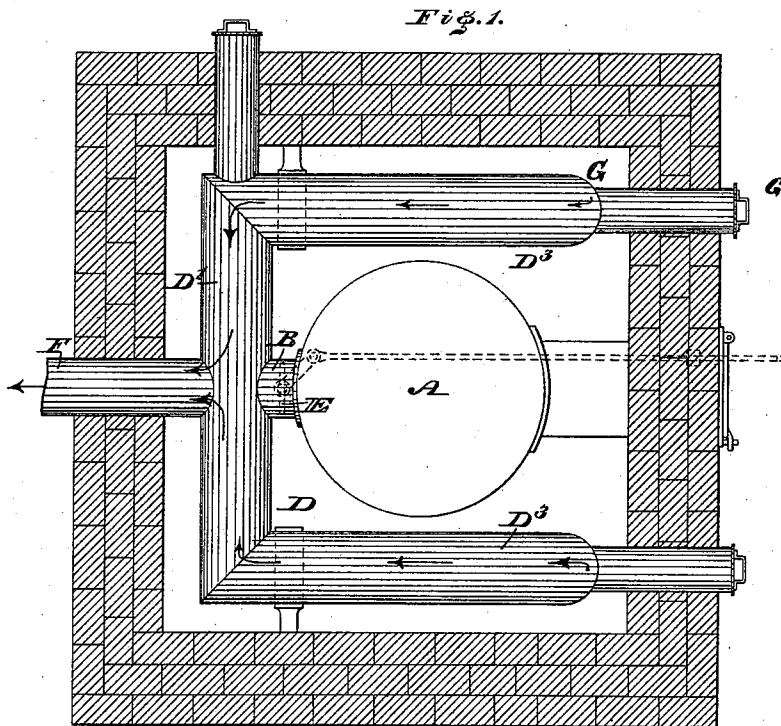
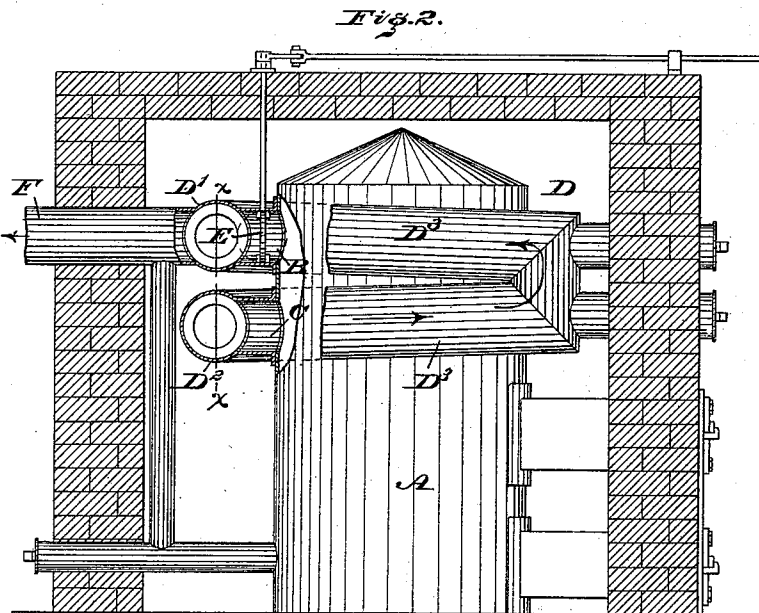
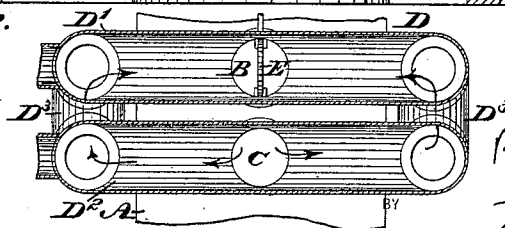


(No Model.)

R. M. BACHE.
HEATING APPARATUS.

No. 350,337.

Patented Oct. 5, 1886.



WITNESSES:

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HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 350,337, dated October 5, 1886.

Application filed March 15, 1886. Serial No. 195,202. (No model.)

To all whom it may concern:

Be it known that I, R. MEADE BACHE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Heating Apparatus, which improvement is fully set forth in the following specification and accompanying drawings, in which—

10 Figure 1 represents a top or plan view of heating apparatus embodying my invention. Fig. 2 represents a partial side elevation and partial vertical section thereof. Fig. 3 represents a vertical section of a portion thereof in line *x x*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of improvements in heating apparatus, whereby many advantages 20 are obtained, as will be hereinafter fully set forth.

Referring to the drawings, A represents a furnace, which, in general, is of usual form and construction.

25 B C represent outlet-pipes connected with the hot-air chamber at different heights and serving to direct the products of combustion from the furnace to the chimney-flue.

30 D represents a radiator, which consists of horizontally-arranged drums D' D², located one above the other and formed of cast or wrought iron, copper, or other material, the upper drum being connected with the outlet-pipe B, and the lower drum with the outlet-pipe C, 35 said drums being also connected with each other by elbows D³, whereby they are in communication, and may be made square or cylindrical, or both, in cross-section or other desired form, the radiator, as will be seen, encircling the furnace at or near the upper portion thereof, and extending angularly around the same, although a circular or other form may be adopted.

45 The outlet-pipe B is provided with a valve or damper, E, whereby the products of combustion may be prevented from leaving the furnace through said pipe, and the radiator has a pipe, F, for discharge of the products of combustion therefrom.

50 The drums are substantially horizontal, either with the lower drums horizontal and

the upper drums inclined upward toward the rear, or else with both the lower and the upper drums inclined, the first toward the front, the second toward the rear.

55 It will be seen that when the fire is first made and the valve E is open the products of combustion enter the pipe B and passing across the adjacent part of the drum D' reach the pipe F, and thence escape into the chimney-flue. 60 When the fire is well made or in good condition, the valve E is closed and the products of combustion enter the pipe C and are thereby directed into the lower drum, D², and thence through the elbows D³ into the upper drum, after which they are discharged from the upper drum, by the pipe F, it being noticed that said products traverse the lower drum, 65 starting at the place of junction of the pipe C and then traverse the upper drum, D', from the elbows D³ to the exit at the pipe F, or, in other words, the products of combustion circulate in opposite directions through the drums D' and D² around the source of heat until they find vent at the pipe F, thence escaping into the chimney-flue. 75

It follows from this construction that the heated air seeking to escape into the chimney has still more heat imparted to it while compelled to circulate around the source of heat. 80 Furthermore, the intersections of the pipe B with the drum D' and of the pipe F with the drum D² being on the line of the center of the whole mass of metal of the radiator, these points will tend uniformly to be the hottest of 85 any on the radiator, and, both for this reason and because these points are at the same time respectively the vents into the chimney-flue, they will actually in practice be relatively hotter than usual. On account of these circumstances, therefore, from first to last of the firing of the furnace the draft will tend to be immediate and then will be rapid and continuous. Again, the radiator, owing to the 95 manner of the construction and disposition of the drums D' D², presents a larger radiating-surface by far than that supplied by the drums or other radiators in ordinary furnaces, and this without checking the draft by downward vertical movement of the air and without occupying space otherwise utilizable, and thereby necessitating the enlargement of 100

the furnace as a whole. On the contrary, although its heating capacity is increased through the exposure of greater radiating-surface than usual in the air-chamber, yet, co-incident with this addition, the entire apparatus is about as compact as usual.

Connected with the elbows are pipes G of smaller diameter than the said elbows passing through the walls of the furnace and provided at the open outer ends with caps G', whereby easy access may be had to the interior thereof, and the dust which collects in the said pipes may be readily removed therefrom.

I am aware that it is not new to construct a furnace with radiators partially encircling the same, said radiators leading to the flue; neither is it new to supply the outlet-pipe with a valve whereby the products of combustion may be directed by a different channel to the flue, and such I do not claim.

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

1. A heating apparatus having two outlet-pipes leading therefrom, the upper one hav-

ing a damper therein, two horizontal or approximately horizontal radiators located one above the other and connected at their ends by elbows, the lower outlet-pipe leading into the lower radiator and the upper outlet-pipe leading into the upper radiator, and a discharge-pipe leading from the upper radiator, all substantially as described.

2. The furnace A, having outlet-pipes B and C, the said pipe B having a damper therein, the horizontal radiators or drums D' D², located one above the other, the drum D' being connected with the outlet-pipe B, and the drum D² with the outlet-pipe C, the elbows D³, connecting said drums D' D², the discharge-pipe F, connected to the drum D', dust-pipes G, connected to elbows D³ and having caps G' on open ends outside of the walls of the furnace, all combined and arranged substantially as described.

R. MEADE BACHE.

Witnesses:

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