(No Model.)

H. J. WATTLES.

HEATING APPARATUS.

No. 493,537. Patented Mar. 14, 1893.

Fig. 1

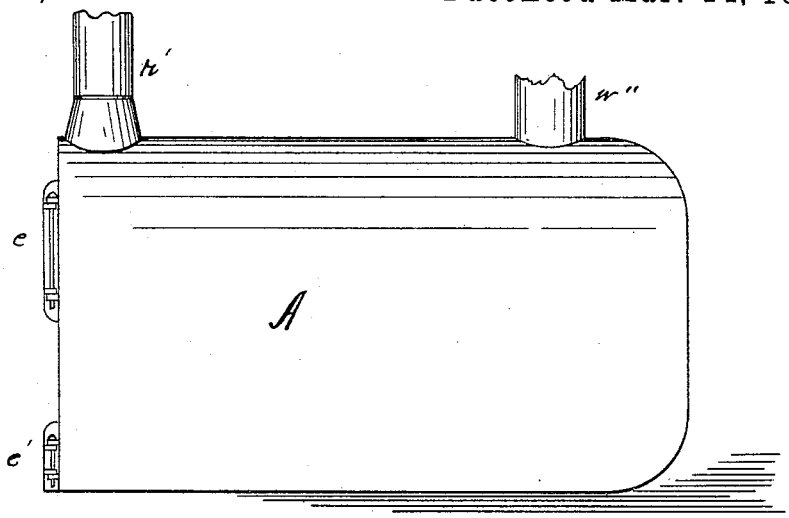


Fig. 2

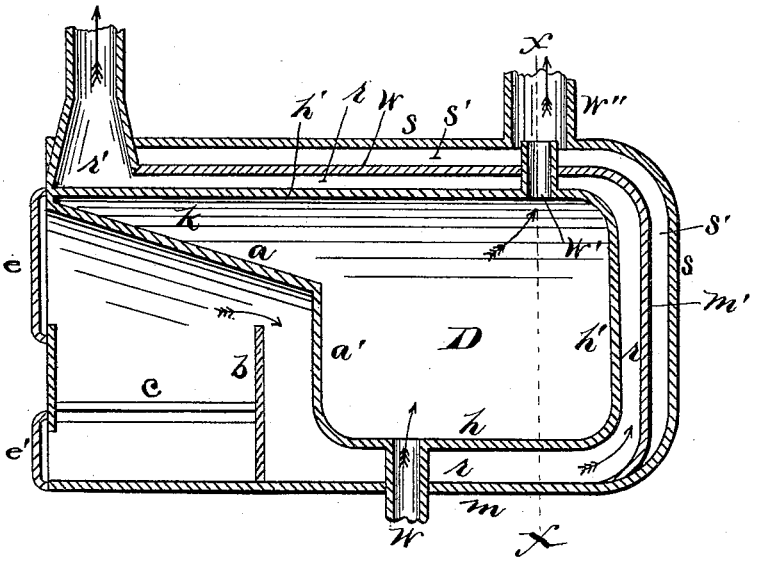
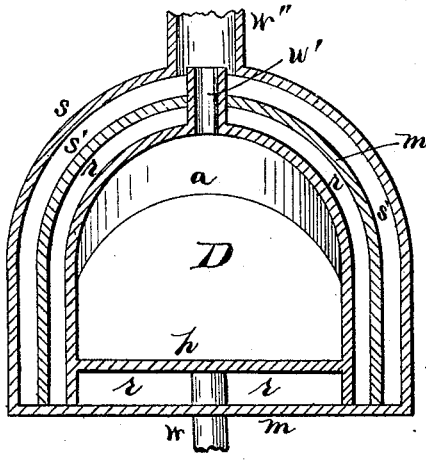


Fig. 3.



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UNITED STATES PATENT OFFICE.

HIRAM J. WATTLES, OF SYRACUSE, NEW YORK.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 493,537, dated March 14, 1893.

Application filed October 28, 1892. Serial No. 450,277. (No model.)

To all whom it may concern:

Be it known that I, HIRAM J. WATTLES, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Heating Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to heating apparatus and my object is to produce an improved hot air or hot water heater, or steam producer, comprising a fire-box and combustion chamber, and indirect smoke-flue, an air or water chamber within or substantially inclosed by said flue, and a water, air or steam chamber exterior to and substantially inclosing said flue, and connected to the inner air or water chamber.

My invention consists in the several novel features of construction and operation hereinafter described and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which

Figure 1, is a side elevation of the boiler. Fig. 2, is a longitudinal vertical section thereof. Fig. 3, is a transverse vertical section thereof, on line *x x*, Fig. 2.

A—, is the boiler.

B—, is the fire-pot and combustion chamber having an arching and rearwardly inclined crown-sheet —*a*—, a rear bridge-wall —*b*—, a grate —*c*—, an ash-pit —*d*—, and a feed-door—*e*—and an ash-pit door—*e'*—. The crown sheet is extended downward and meets the bottom plate —*h*— and the vertical wall —*h'*— and the top —*h''*—, said crown-sheet and its extension —*a'*—, said bottom-plate, end plate and top being all connected together and together forming the inner air, or water chamber —D— and its front extension —*k*— over the crown-sheet.

The bridge-wall —*b*— extends down to the bottom —*m*— of the boiler, and in conjunction with the crown-sheet extension, the plate —*h*—, the walls —*h'*— and —*m'*—, the top —*h''*— and the plate —*m''*— exterior thereto constitute the indirect draft flue —*r*— which discharges into the stack —*r'*— said flue being open all over the top of the chamber —D— permitting the products of combustion to flow all over said top above the plate —*h*—.

An outer casing extends over the boiler and down over the sides of the chamber —D— exterior to the flue —*r*— and it may or may not, as desired, extend down over the rear end of the boiler.

An inlet pipe —*w*— admits air or water into the chamber —D— and —*w'*— is the eduction pipe therefrom, or the connection between the chamber —D— and the air or water chamber —*s'*— between the flue —*r*— and the casing, and —*w''*— is the eduction pipe therefrom, it being also an extension of the eduction pipe —*w'*—.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a heater, the combination, with the combustion chamber, the indirect flue leading therefrom to the stack, of an air or water chamber substantially inclosed within said flue, an outer casing creating an air or water chamber exterior to said flue, an induction pipe leading to the inner chamber, and eduction pipes from said air or water chambers.

2. In a heater, the combination, with the combustion chamber, the crown-sheet, and the indirect flue leading from said chamber to the stack, of an air or water chamber, partially inclosed within said flue and extending forward over said crown-sheet, an outer casing creating an air or water chamber exterior to said flue, an induction pipe leading to said inner chamber, and eduction pipes leading from said air and water chambers.

3. In a heater, the combination, with the combustion chamber, the crown-sheet, and the indirect flue leading from said chamber to the stack, of an air or water chamber partially inclosed within said flue, an outer casing extending over the top and rear and creating an air or water chamber over and in rear and exterior to said flue, and induction and eduction pipes to and from said air or water chambers.

4. In a heater, the combination, with the combustion chamber, the crown-sheet, and the indirect flue leading from said chamber to the

stack, of an air or water chamber partially inclosed within said flue and extending over said crown-sheet, an outer casing extending over the top and rear and creating an air or water chamber over and in rear and exterior to said flue, and induction and eduction pipes to and from said air or water chambers.

In witness whereof I have hereunto set my hand this 26th day of October, 1892.

HIRAM J. WATTLES.

In presence of—
C. W. SMITH,
HOWARD P. DENISON.