

Apr. 17, 1923.

1,452,249

D. O. MILLER

COMBINATION HEATER

Filed Nov. 29, 1922

Fig. 1.

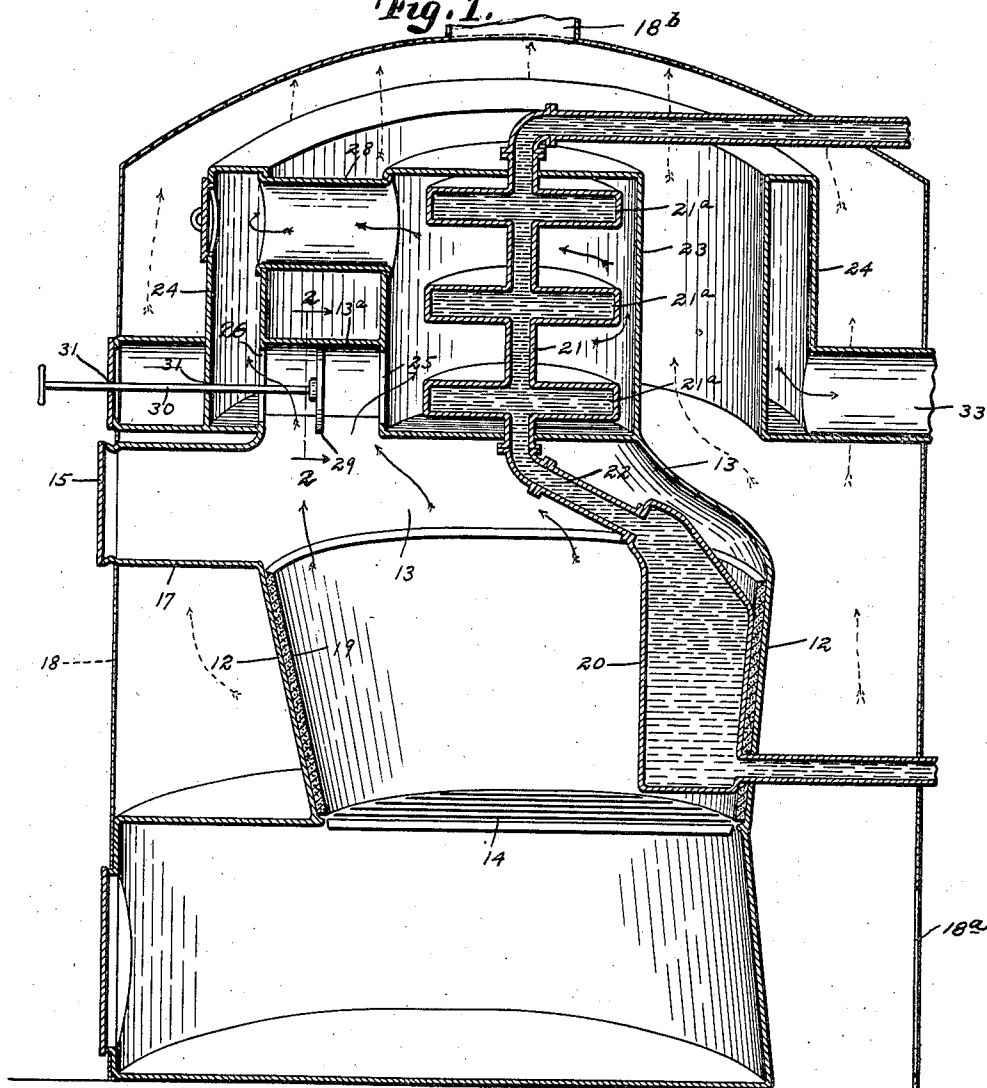


Fig. 2.

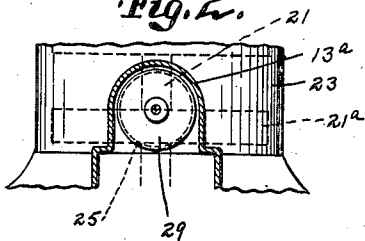


Fig. 3.

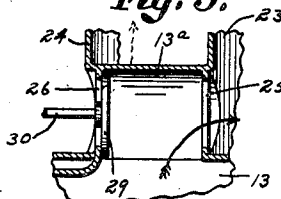
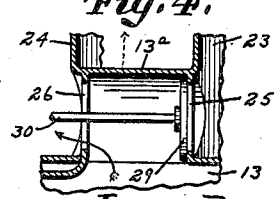


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANA O. MILLER, OF READING, MASSACHUSETTS.

COMBINATION HEATER.

Application filed November 29, 1922. Serial No. 604,024.

To all whom it may concern:

Be it known that I, DANA O. MILLER, a citizen of the United States, residing at Reading, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Combination Heaters, of which the following is a specification.

This invention relates to a heater, in which the hot products of combustion are adapted to heat and circulate both air and water, the heater including air-heating surfaces contacting with air which passes to registers, and a water-circulating system, a portion of which is a water-leg within the fire-pot and another portion is above the fire-pot, said portions being inclosed within the heater and connected with radiators.

The object of the invention is to provide means whereby the direction taken by the hot products of combustion passing from the fire-pot of the heater, may be varied, so that said products may be concentrated wholly or mainly either on the enclosed portion of the water-circulating system located above the fire-pot, or on air-heating surfaces remote from said system, to the end that the effectiveness of either of the heating mediums may be increased at the expense of the other, or in other words, the products of combustion after leaving the fire-pot may be concentrated wholly, or mainly, either on the water above the fire-pot or on the air.

I attain these and other related objects by the improvements hereinafter described. Of the accompanying drawings forming a part of this specification,—

Figure 1 is a vertical sectional view, partly in perspective, of a combination heater embodying the invention, the valve hereinafter described being in an intermediate position.

Figure 2 is a fragmentary section on line 2—2 of Figure 1.

Figures 3 and 4 are fragmentary sections showing the valve in its closing positions.

The same reference characters indicate the same parts in all the figures.

In the drawings, 12 represents a fire-pot, which may be of any suitable form and construction, and is surmounted by a dome 13, which receives the hot products of combustion, and discharges the same through outlets in its upper portion.

The grate 14, shown conventionally by Figure 1, may be of any suitable type. The fire door 15 is here shown as closing the

outer end of a fuel passage 17, extending from the usual external casing or jacket 18, to the dome, above the usual fire-brick lining 19. It will be understood, however, that any other suitable means may be provided for admitting fuel to the fire-pot, and that the form and general construction of the heater may be variously modified.

The water-circulating system may include the usual water leg 20, located in the back portion of the fire-pot, and a riser 21, located above the dome, and communicating with the water leg through a connection 22, extending through the dome.

The riser is here shown as including horizontal enlargements, or water chambers 21^a, but it may be otherwise formed and constructed.

23 represents an inner drum, surmounting the dome and enclosing the riser. 24 represents an outer drum, preferably of annular form, and surrounding the inner drum, said drums being spaced apart, and the outer drum being spaced from the jacket 18, so that air entering the lower portion of the jacket, passes upward in contact with the opposed surfaces of the two drums, and between the outer surface of the outer drum, and the inner surface of the jacket, as indicated by the dotted arrows in Figure 1, the air being heated and passing as usual to a suitable register or registers.

The dome 13 is provided with an inner outlet 25, communicating with the lower portion of the inner drum 23, and with an outer outlet 26, communicating with the lower portion of the outer drum 24. Said outlets are preferably located at opposite ends of a hood or extension 13^a, which communicates with the main portion of the dome 13, and projects upward therefrom between the drums.

The upper portions of the drums are connected by a flue 28. 29 represents a valve which is movable to close either the outer outlet 26, as shown by Figure 3, or the inner outlet 25, as shown by Figure 4. The valve 29 is movable also to an intermediate position, leaving both outlets open, as shown by Figure 1. The valve is provided with a stem 30, movable in suitable guides 31, whereby it may be moved to either of the described positions.

The arrangement shown and described is such that when the valve 29 closes the outer opening 26, all of the products of com-

bustion pass through the inner outlet 25, and are concentrated on the riser 21, said products circulating over the surfaces of the riser, and then passing through the flue 28 to the outer drum. When the valve closes the inner outlet 25, all of the products of combustion pass through the outer outlet 26, and are concentrated on the surfaces of the outer drum.

When the valve is in its intermediate position, the products of combustion are divided, and pass through both drums, as indicated by the full line arrows in Figure 1.

The products leave the outer drum through a pipe 33, communicating with a chimney or stack.

The casing 18, which is shown somewhat conventionally by Figure 1, may be of any suitable form and construction, and provided with means, such as an inlet 18^a, for the admission of cold air, and with means, such as an outlet 18^b, for the delivery of hot air, as in ordinary hot-air furnaces.

I claim:

1. A combination heater comprising a domed fire-pot, a water-circulating system including a water leg in the fire-pot and a riser extending upward through the dome, an inner drum enclosing the riser, an outer drum spaced from the inner drum, a flue connecting the upper portions of said drums, the dome being provided with an inner outlet communicating with the inner drum, and with an outer outlet communicating with the outer drum, means for closing either outlet and leaving the other open, the arrangement being such that the hot products of combustion pass wholly through the inner drum, and are concentrated on the riser when the outer outlet is closed, and pass wholly through the outer drum, and are excluded from the riser when the inner outlet is closed, and a casing enclosing the said heater, and provided with means for the admission and discharge of air.

2. A combination heater comprising a domed fire-pot, a water-circulating system

including a water leg in the fire-pot and a riser extending upward through the dome, an inner drum enclosing the riser, an outer drum spaced from the inner drum, a flue connecting the upper portions of said drums, the dome being provided with the inner outlet communicating with the inner drum, and with an outer outlet communicating with the outer drum, a valve adapted to occupy a position closing the inner outlet only, a position closing the outer outlet only, and an intermediate position, the arrangement being such that the hot products of combustion pass wholly through the inner drum, and are concentrated on the riser when the outer outlet is closed by the valve, pass wholly through the outer drum, and are excluded from the riser when the inner outlet is closed by the valve, and are divided and pass through both drums, when the valve is in its intermediate position, and a casing enclosing the said heater, and provided with means for the admission and discharge of air.

3. A combination heater comprising a domed fire-pot, a water-circulating system including a water leg in the fire pot, and a riser extending upward through the dome, an inner drum enclosing the riser, an outer drum spaced from the inner drum, a flue connecting the upper portions of said drums, the dome being provided with an extension projecting upward between the said drums, and having an inner outlet at one and an outer outlet at the opposite end, said outlets communicating respectively with the inner drum and the outer drum, a valve movable in said extension to a position closing either of said outlets, and to an intermediate position leaving both outlets open, and a casing enclosing the said heater, and provided with means for the admission and discharge of air.

In testimony whereof I have affixed my signature.

DANA O. MILLER.