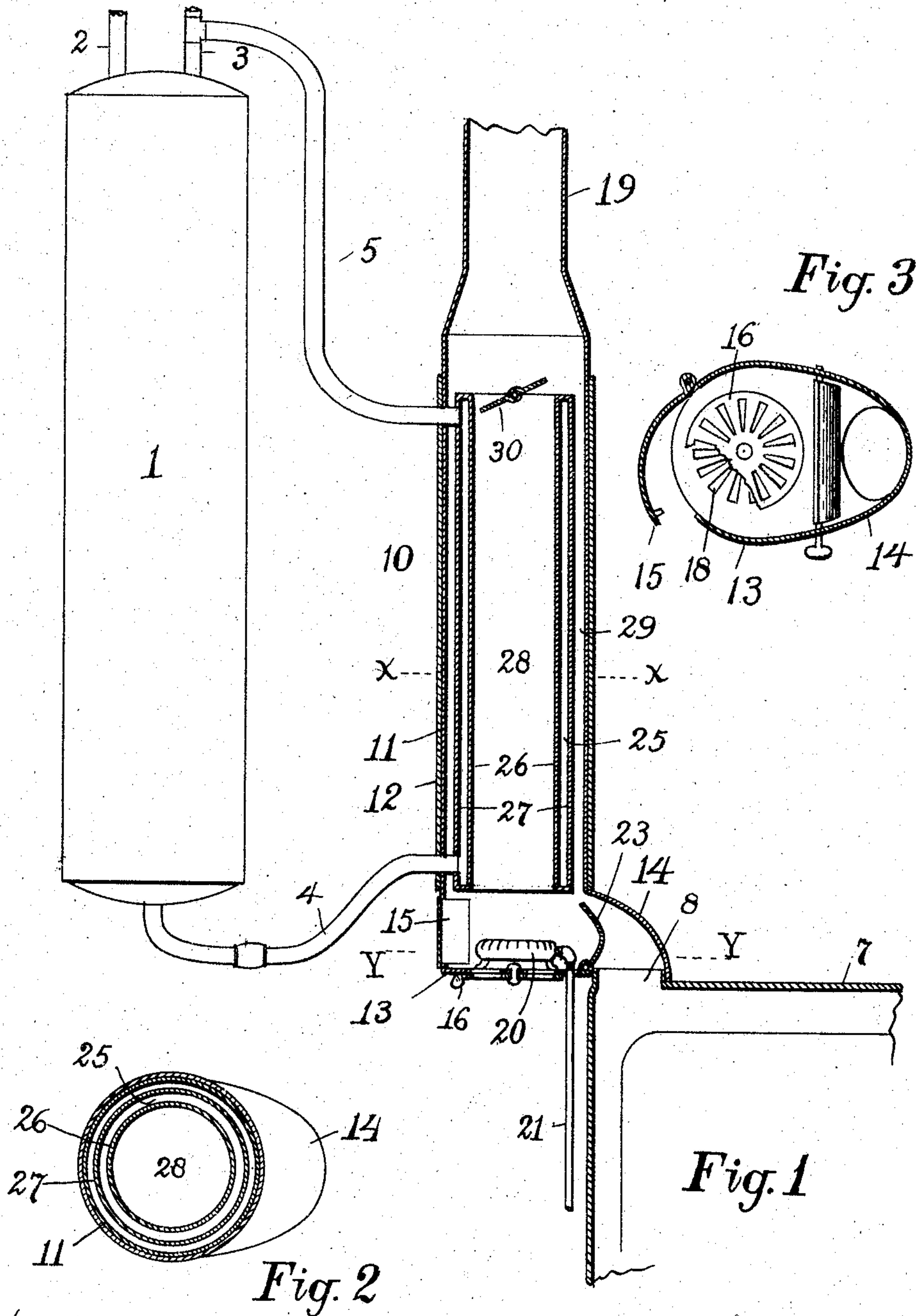


No. 780,736.

PATENTED JAN. 24, 1905.

E. S. STACK.  
WATER HEATER.  
APPLICATION FILED SEPT. 2, 1903.



Witnessed;

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His Attorney.



# UNITED STATES PATENT OFFICE.

ELMER S. STACK, OF SOMERVILLE, MASSACHUSETTS.

## WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 780,736, dated January 24, 1905.

Application filed September 2, 1903. Serial No. 171,600.

*To all whom it may concern:*

Be it known that I, ELMER S. STACK, a citizen of the United States, and a resident of Somerville, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Water-Heaters, of which the following is a full, clear, and exact description.

This invention relates to means whereby a water-heater permanently connected with a kitchen range or stove and also with the usual so-called "boiler" may without delay be made to receive heat from the fire within the stove or from a gas-burner beneath the heater.

Referring to the drawings forming part of this specification, Figure 1 is an elevation of my water-heater, a boiler, and the rear part of a kitchen range or stove, the heater and stove being shown in section. Fig. 2 is a horizontal section of the heater on the line X X in Fig. 1, and Fig. 3 is a sectional view on the line Y Y in Fig. 1, showing the invention as made in substantially my preferred construction, but modified to the extent of having the air-controlling damper located upon the floor of the base instead of beneath it, as elsewhere indicated.

The reference-numeral 1 designates the usual boiler, having water-supply pipe 2; pipe 3, leading to the hot-water faucets; pipe 4, to the heater, and pipe 5 from the heater to the pipe 3.

7 indicates the range or stove, having the usual smoke-outlet 8, connected by a stove-pipe to the chimney. The heater itself consists of the drum 11, made somewhat larger in diameter than the stovepipe 19, by which its upper end is connected with the chimney, and containing the heater proper. It is preferably surrounded with asbestos 12 to reduce radiation. The heater proper may be constructed in any desired manner without affecting the essence of my invention, the apparatus shown comprising the concentric shells 26, 27, inclosing between them the annular space 25, designed to contain the water to be heated, the latter being supplied thereto and taken therefrom by the said pipes 4 and 5. The base 13 of the drum 11 is formed with the offset 14, designed to be fitted upon the

smoke-exit 8, while a door 15 permits of access within the space beneath the said shells. In said space is located a gas-burner 20 of any desired style, supplied with gas through a pipe 21. This pipe may either be of metal and permanently fixed in position, as indicated in Fig. 1, or it may be a flexible tubing, so that both it and the burner can be introduced through the door 15 into said base or removed therefrom in the same manner. The floor of the base 13 is formed with numerous openings, as 18, to permit of the admission of air to said burner, these openings being closed when desired by means of the similarly-apertured plate 16, pivoted beneath said floor, as shown in Fig. 1, or upon the same, as shown in Fig. 3. With a fixed burner the former arrangement is of course preferable. The offset portion of the base is made capable of separation from the remainder of the base by the vertical damper 23, pivoted at its lower edge and proportioned to have its top edge a short distance from the roof of the base offset. When the gas-burner is made removable, this damper may be flat and so constructed to be turned down upon the base-floor; but when the burner is designed to remain within the base then said damper is formed with a bend, as shown in Fig. 1, to enable it to lie as snug as possible upon the top of the burner when turned down.

When there is a good fire burning in the range or stove, there is no occasion for the gas-burner to be lighted and the damper 23 should be turned down to give a free path for the escape of the smoke and other products of combustion from the fire, while the damper 30 is to be opened or partially closed in accordance with the condition of the fire and draft. In case, however, the stove-fire is low or nearly out then the damper 23 is turned up to its vertical position to exclude the possible access of the products of combustion from the smoldering fire, and thereby interfering with the proper burning of the gas. The slide or plate 16 is also turned to give free ingress of air to the gas, and the latter lighted. The damper 30 should in addition be almost wholly closed to retain with the space 28 as much as possible of the heated gases from the burner



and to force them to rise through the annular space 29, thereby applying heat to both surfaces of the water within the space 25. Whatever gases are arising from the slight fire in the stove are permitted to escape through the space between the top edge of the damper 23 and the offset roof, while if there is no such fire said damper shuts off whatever cold air might otherwise rush up through the stove and tend to cool the heater. Within three or four minutes, or even less, after lighting the gas in the burner the water is hot enough to draw off from the faucets, inasmuch as the pipe 5 from the heater joins direct to the pipe 3 to such faucets, and thereby permits of the quickly-heated water to go at once to such faucets instead of to the boiler, as is more usually done, and so have to raise the temperature of the entire mass in the boiler. If the water is not drawn off from the faucets, it circulates from the pipe 5 down through the pipe 3 into the boiler, warming the water therein, while the cold water therefrom passes through the pipe 4 into the heater. I further design the damper 23 to be adapted to be closed over toward the left upon the smoke-exit 8, and thereby wholly prevent any cold air from ascending from the stove when there is no fire in the latter.

30 In the expression "stove or range" employed by me I wish to embrace all forms of fuel-burning heating or baking devices, as cooking-stoves, wood or coal heaters, furnaces, fireplaces, &c.

35 The economy of my water-heater is fully equal to its convenience, as the warmth delivered to the water by the range-fire is entirely by means of the heat of the waste products of combustion, and there is no robbing of the oven of the heat, as in the usual water-front or water-back.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. The combination of a stove or range, a water-heater constructed to be heated by the

products of combustion from said stove or range, a chamber located partially beneath said water-heater, a gas-burner located in said chamber, and a damper constructed to close the flue of the stove or range and permit the circulation of gases from the gas-burner, when turned in one direction, and to open the flue from the stove or range when turned in the opposite direction, substantially as described.

2. The combination of a stove or range, a vertically-extended water-heater having a horizontally-extended base a part of which communicates with the exit-flue of the stove or range and the balance constitutes a chamber, a gas-burner located in said chamber, and a damper pivoted at its lower edge between said burner and exit-flue; the floor of said chamber having closable openings, substantially as described.

3. The combination with a stove or range burning a fuel which gives off heavy products of combustion, of a vertically-rising water-heater having a horizontally-extended base, and a gas-burner located in said base; a part of said base being located over the flue of said stove or range to permit the products of combustion to pass therefrom up through the heater, and the other part of said base lying beyond the limits of the stove or range and having closable openings in the floor thereof; said gas-burner being located above said openings; whereby when a fire is burning in said stove or range and said burner is not needed, said openings can be closed to preserve the draft for such fire, while when such fire is out, said openings can be opened to admit oxygen to the flame of the gas-burner, substantially as described.

In testimony that I claim the foregoing invention I have hereunto set my hand this 29th day of August, 1903.

ELMER S. STACK.

Witnesses:

FRED G. TILTON,  
ELLIOTT T. TILTON.