

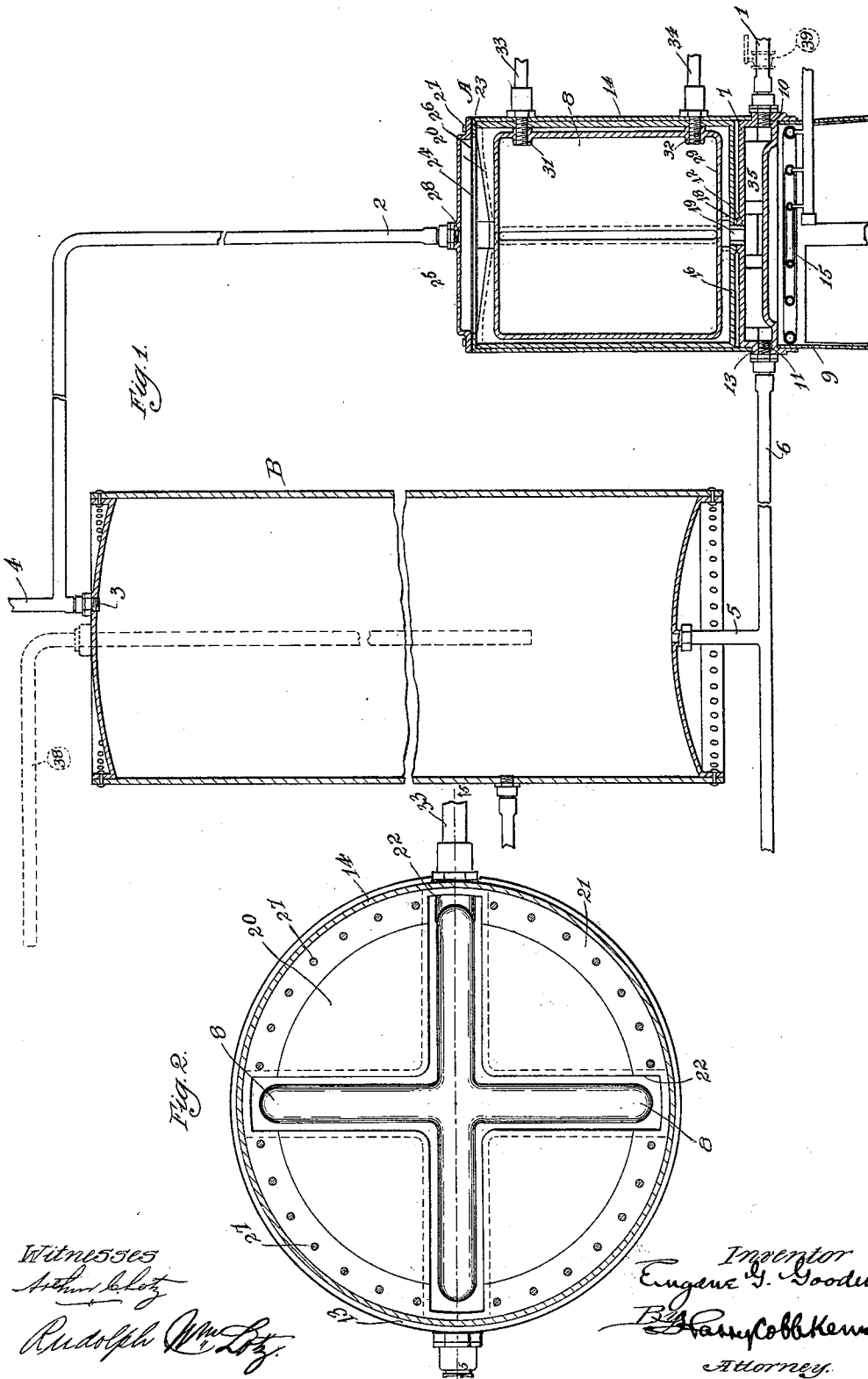
(No Model.)

2 Sheets—Sheet 1.

E. G. GOODWIN.
WATER HEATER.

No. 544,353.

Patented Aug. 13, 1895.



Witnesses
Arthur H. Lutz

Rudolph W. Lutz

Inventor
Eugene S. Goodwin
By Harry Cobb Kennedy
Attorney.

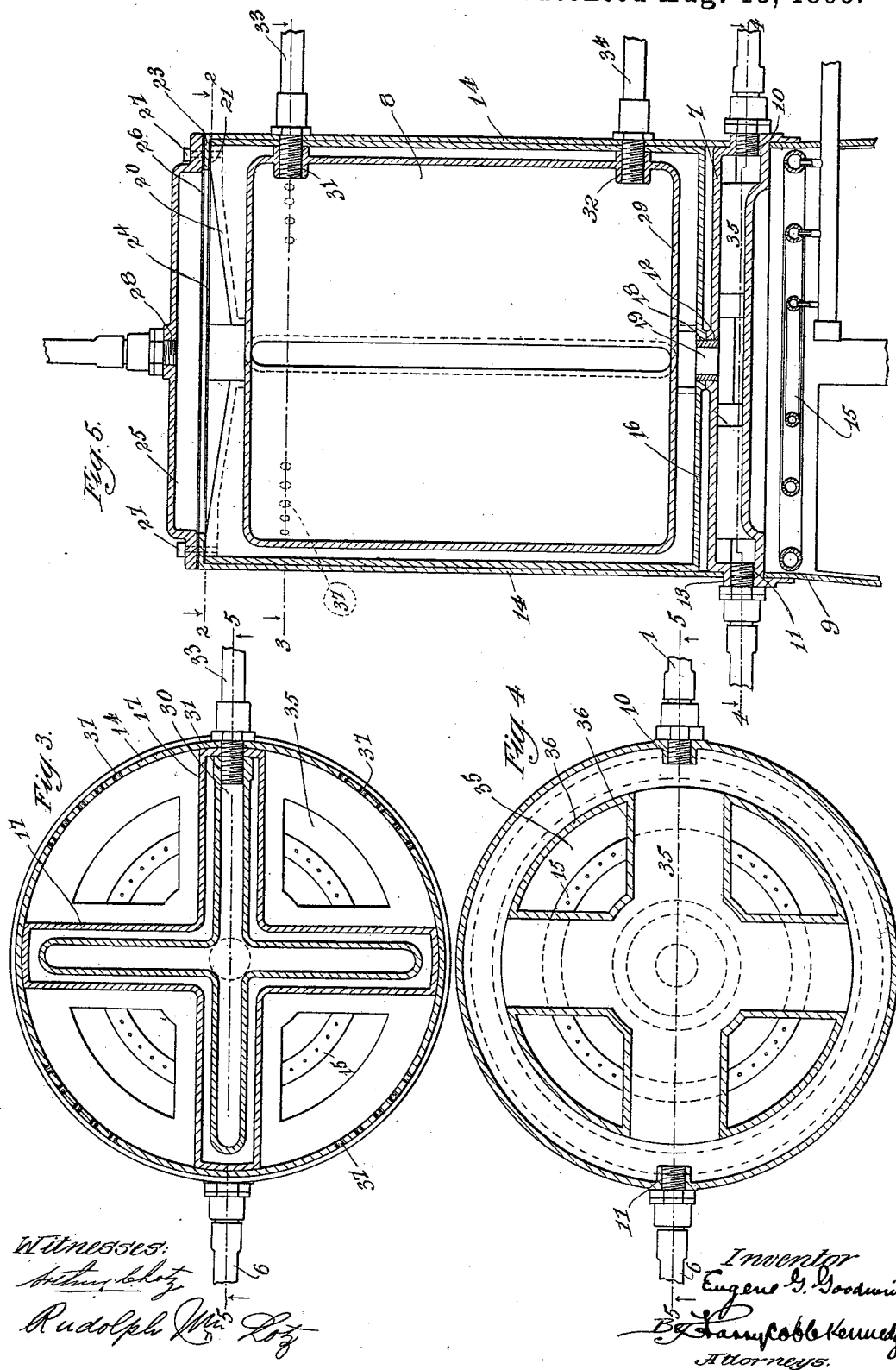
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UNITED STATES PATENT OFFICE.

EUGENE G. GOODWIN, OF CHICAGO, ILLINOIS.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 544,353, dated August 13, 1895.

Application filed May 29, 1894. Serial No. 512,923. (No model.)

To all whom it may concern:

Be it known that I, EUGENE G. GOODWIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Heaters; and I do hereby 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.

This invention relates to a novel construction and arrangement in a water-heater, the object being to provide a water-heater, adapted more especially for use in houses, that will furnish a supply of hot water to the hot-water tank without the employment of the water-back, but in connection with a gas or oil burner, or with the hot-water or steam heating system of the house.

In employing my system for heating water, the hot-water tank can be connected in the usual way with the water-back of the range, if desired, and may at the same time have the water-heater in communication with the hot-water or steam heating system of the building, and also be supplied with a burner, according to the arrangement preferred, and I will point out hereinafter the specific construction of the parts and the ways in which it can be employed.

The invention consists in the features of construction and combination and arrangement of parts hereinafter fully described and specifically claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view of a water-heater constructed in accordance with my invention and a hot-water tank communicating therewith. Fig. 2 is a horizontal sectional view of the water-heater on an enlarged scale and taken on the line 2 2 of Fig. 5. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 5. Fig. 4 is a horizontal sectional view taken on the line 4 4 of Fig. 5. Fig. 5 is a central vertical section of the water-heater, taken on the line 5 5 of Figs. 2, 3, and 4.

Referring now to said drawings, A indicates, as a whole, the water-heater, and B the hot-water tank, said hot-water tank B being of familiar construction. The said water-heater A is provided with a water-inlet pipe 1 leading from a water-main or other supply,

and is located at the lower end of the water-heater. From this supply-pipe 1 the water enters the heater, is heated therein, and passes off through the outlet-pipe 2 that leads to the inlet-port 3 at the upper end of the water-tank B, and communicates also with the hot-water-supply pipe 4 of the building. The hot-water tank B is provided at its lower end with an outlet-pipe 5 that communicates also with the lower end of the heater A through a pipe 6.

In a system for heating water, as above described, the water will enter through the pipe 1, pass up through the pipe 2, and circulate through the hot-water-tank pipes 5 and 6, and so on, or pass off through the hot-water-supply pipe 4 in an obvious manner.

I will now proceed to describe the particular construction of said water-heater A. The said water-heater A is divided into two principal parts—namely, the heating-drum 7 and the heater 8. The said heating-drum is employed for heating the water by means of burners employing gas or oil, while the heater 8 is employed for heating the water by means of the hot-water or steam system of the building, although I have arranged it that said burner may also act in connection with the heater 8. The cold-water supply enters the heating-drum 7, said heating-drum communicates at its upper end with the lower end of a water-receptacle or second chamber 16, and the upper end of the said second chamber 16 communicates with the pipe 2, leading from the upper end of the heater. The heating-drum 7 is preferably cylindrical and is suitably supported by a stand 9 or in any other convenient manner. Said drum 7 is provided conveniently at diametrically-opposite points with the ports 10 and 11. The said heating-drum is provided on its upper side and about its center with a port 12 and is provided at its periphery with a shoulder 13, upon which rests the outer casing or chamber. (Indicated by 14.) Beneath the heating-drum 7 is a suitable burner of any approved construction, (indicated by 15,) in which gas or oil can be burned for heating the said drum. Located within the casing or chamber 14 of the heater is the water-receptacle or second chamber 16, consisting, preferably, of four hollow wings 17, whose walls join each other, so that said water-receptacle

16 in cross-section has the form of a cross. The said water-receptacle 16 fits within the casing 14 and is provided at its lower end, at about its center, with a port 18, by means of which communication between the heating-drum and said water-receptacle is established by a nipple 19, as clearly shown in Fig. 5. At the upper end of the water-receptacle 16 the spaces between the walls of the hollow wings are open, while extending between the walls of each hollow wing and the adjacent wall of the hollow wing at right angles thereto is a partition, web, or closure 20, Figs. 2 and 4. The said webs are at an incline for draining off the water, should the heater be empty, and at the upper and outer end join a flat ring 21, that extends around the entire water-heater, although cut out at the points marked 22. The upper end of the casing 14 is provided with an inwardly-turned flange 23 to encounter the ring 21, and then a suitable packing or gasket 24 is placed between the ring 21 and flange 23. Upon the upper end of the casing 14 is located a top plate or hood 25, between which and the flange 23 of the casing a packing or gasket ring 26 is placed, and the hood-flange 23 and ring 21 are firmly bolted together by means of bolts 27. The pipe 2 communicates with the interior of the water-receptacle 16 through the port 28 in the hood 25, as shown in Fig. 5.

The heater 8 for heating the water within the receptacle 16 is of the same general form as said water-receptacle—that is to say, it has the hollow wings 30 located at right angles, but is entirely closed at its upper and lower ends. The said heater 8 fits within the water-receptacle 16 and in the sides of one of its wings has the ports 31 and 32, through which communication is established between said heater 8 and the hot-water or steam heating system of the building by means of the pipes 33 and 34, which pass through the adjacent walls of the casing 14 and wings 17 and have tight joints with said ports 31 and 32.

As a further and separate improvement I have arranged so that the burner 15 will not only heat the water as it passes through the drum 7, but will also attack the sides of the wings 17 of the water-receptacle. For this purpose I arrange four passages 35 through the drum at points between the wings of the water-receptacle, said passages 35 being formed by vertical walls 36 extending between the upper and lower sides of said drum 7. Near the upper end of the casing 14, as shown in Figs. 3 and 5, and between the wings 17 of the water-receptacle, are a series of openings 37 for the escape of the products of combustion. It will be seen that the relative contour of the casing 14 and water-receptacle or second chamber 16 is such that flues are formed between the said parts.

I will now proceed to describe the manner in which said water-heater is used. For instance, it may be that the heater is in communication with the water-back and with the

hot-water and steam heating system of the building, or both, and is also provided with the burner 15. In the summer time, or at other times when the heating system of the house is not in use, or when there is no fire in the range, a supply of hot water can be easily obtained by lighting the burner 15, which will heat the water in the tank and in the drum in an obvious manner and raise the temperature further, by reason of the heat passing up through the passages or flues 35, and supply the water-tank B with hot water, which may be drawn off in the usual manner. Again, the water can be heated by allowing the steam or hot water of the heating system of the building to pass through the heater 8, causing the circulation aforesaid, whether in connection or not with the water-back or the burner. In the cases above alluded to it is assumed that the water-supply has been through the pipe 1 entering the drum, but it is to be noted that said water-supply can be obtained through the pipe 38, (shown in dotted lines in Fig. 1,) in which case said port 10 would be closed, or if the pipe 1 were used in the system in other relations, a cock or valve 39, (shown in dotted lines in Fig. 1,) could be closed.

It is manifest from the above description that I provide a water-heater for a building that can be applied without disarranging or altering the hot-water tank already in place, or the water-heater system heretofore employed, or, on the other hand, it can be applied as a separate system, and in either case will work with the same efficiency; and it is to be noted that even when applied in connection with these other systems it is unnecessary to change or disarrange them, as they may work separately or in connection with each other.

The apparatus is simple and inexpensive and can be applied at a small cost, and at the same time increases the efficiency and capabilities of the water-heating system of a building.

I claim—

1. The combination with an outer chamber provided with an outlet port at one end, a second chamber within said outer chamber with its end situated adjacent to the said outlet port conforming to the contour of said outer chamber so as to make a water tight joint therewith, an inlet port at the other end of said second chamber, said outer and second chambers being shaped to form flues between their walls, and a heater situated within said second chamber, substantially as described.

2. A water heater consisting of an outer chamber having an inlet port, a second chamber situated within said outer chamber and consisting of a plurality of hollow wings communicating with each other at their inner ends, one end of said second chamber being closed and provided with a port communicating with a source for supplying water thereto, the other end of said second chamber, or the

end adjacent to said outlet port of the outer chamber conforming to the contour of said outer chamber to make a water tight joint therewith, and a heater consisting of a plurality of hollow wings communicating with each other at their inner ends situated within said second chamber and provided with inlet and outlet ports for the inlet and outlet of a heating medium, substantially as described.

3. The combination with an outer chamber provided with an outlet port at one end, a second chamber within said outer chamber with its end situated adjacent to the said outlet port conforming to the contour of said outer chamber so as to make a water tight joint therewith, the upper end of said second chamber being inclined upwardly therefrom to said outer chamber, an inlet port at the other end of said second chamber, said outer and second chambers being shaped to form flues between their walls, and a heater situated within said second chamber, substantially as described.

4. In a water heater, a heating drum, a burner situated beneath said heating drum, upright passages through said heating drum, a water supply for said heating drum, a heater mounted upon said heating drum and consisting of an outer chamber resting upon the heating drum and having passages near its upper end, a second chamber having wings situated within said outer chamber said second chamber being closed at its lower end and communicating with the said heating drum and opening at its upper end into the outer chamber, an outlet port at the upper end of said outer chamber, a heater within said second chamber and having wings and inlet and outlet ports, substantially as described.

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

EUGENE G. GOODWIN.

Witnesses:

HARRY COBB KENNEDY,
E. N. GAGE.