

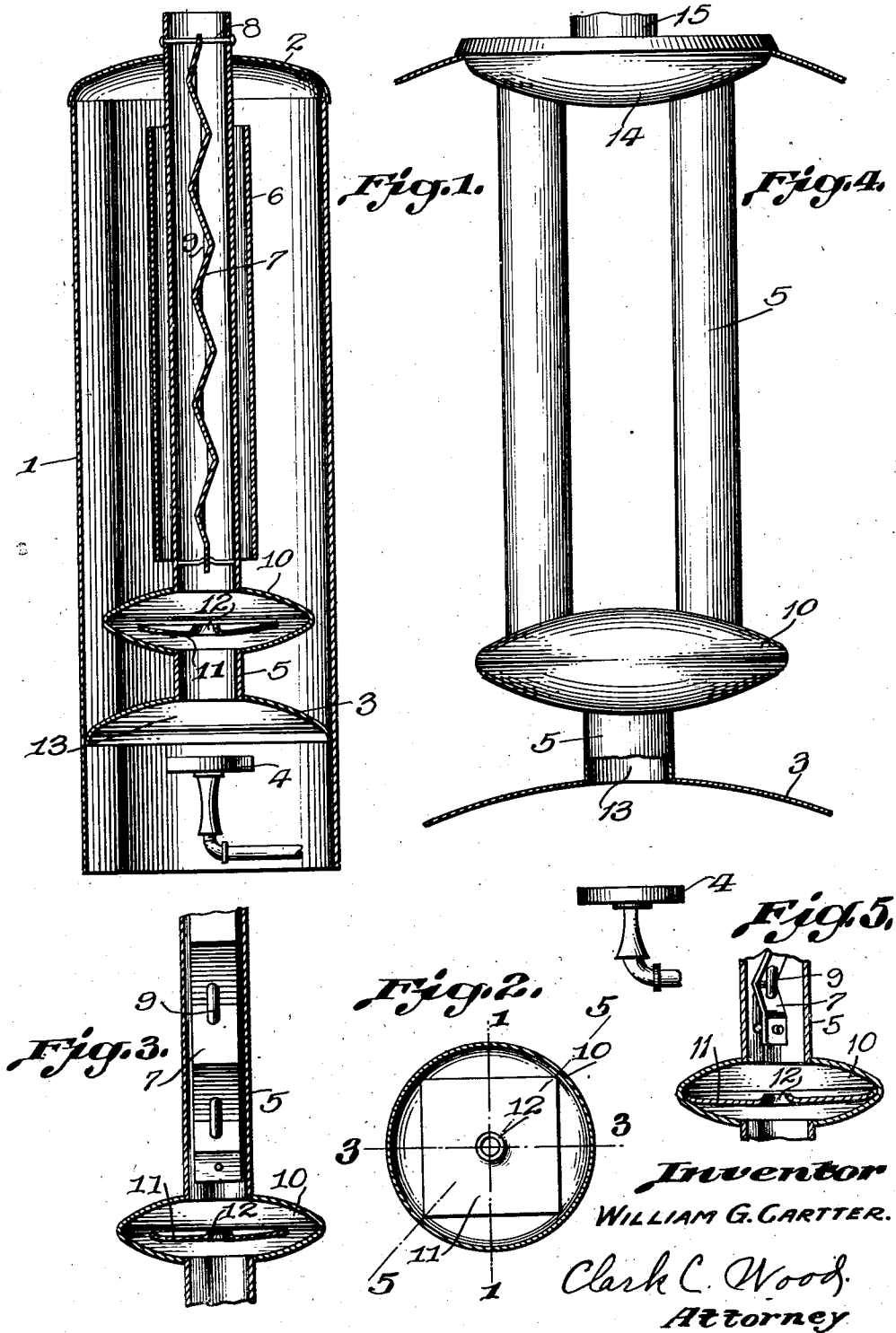
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INTERNAL FLUE FOR HOT WATER HEATERS

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INTERNAL FLUE FOR HOT WATER
HEATERS

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My invention relates to that type of hot water heaters which are provided with an internal flue for the escape of the gases, and have a zigzag partition positioned within the flue to retard the flow of the gases and bring them into more perfect contact with the surface of the flue, and its purposes are (1) to increase the surface of the flue so as to bring a larger quantity of water in contact with it, and (2) to retain the zigzag member within the flue in the most effective position. I attain these purposes by the means shown in the accompanying drawing in which

Fig. 1 is a vertical section of a water heater embodying my invention taken on the line 1-1 of Fig. 2. The flue and its appurtenances only being shown in section, the tank and burner being in diagram since they may be of any approved type and form no part of my invention.

Fig. 2 is a cross-section on the line of the upper surface of the baffle plate 11.

Fig. 3 is a detail vertical section taken on the line 3-3 of Fig. 2.

Fig. 4 is an elevation of a heater embodying my device, the body of the heater being broken away to show the use of a plurality of flues.

Fig. 5 is a detail vertical section taken on the line 5-5 Figure 2.

Referring more particularly to the drawing, 1 is the main body of a water heater, which may be of any approved type. It is closed at the top by a head 2 and at the bottom by a partition 3, forming a chamber below the partition in which is mounted a burner 4. A central flue 5 opens into the burner chamber and passes through the length of the heater and provides for the escape of the burned gases. A circular partition 6 is mounted within the tank, surrounding, but not in contact with the flue 5. This partition is open both at top and bottom and thus provides a quick circulation for water directly in contact with the flue and forms a more rapid means of heating the water in the top of the tank, but this partition forms no part of my invention and may be of any desired construction, or may be omitted entirely. Within the flue 5 is substantially centrally supported a zigzag partition 7. I do not broadly claim the use of such a partition for I am aware that it has been used for a long time, but I have discovered that the efficiency of operation is greatly increased by supporting this partition substantially in the center of the flue and making it narrower than the internal diameter of the flue so as to provide a space for the gases entirely surrounding the partition. The partition 7 is held in position within the flue by supports 8,

which extend through the flue and are connected to the partition in such manner as to retain it in position. The partition itself is stiffened by grooves 9 which are stamped into the angles of the partition and tend to prevent the middle portion of the partition between the supports 8 from moving to one side or the other, and to retain it substantially in the center of the flue. A spheroidal member 10 is inserted at any preferred place in the flue 5 so as to form an enlarged portion of it, or a plurality of said members may be used, and is preferably shaped so that the vertical section is elliptical, as shown in Figs. 1 and 3. A baffle plate 11, polygonal in shape, preferably square, is supported by its angular points, as shown in Figs. 2 and 3, within the member 11, so as to leave a space above and below it and at the sides for the escape of gases and at the same time to force them into contact with the sides of the member 10. The baffle plate is also provided with a small central opening 12 which permits a small portion of the gases to pass directly through the baffle into the main body of the flue 5.

While I have described only one flue, it is evident that any number of flues may be employed, as shown in Fig. 4. In this figure I have shown two flues opening into a common enlarged member at bottom, and into a common chamber 14 at top, from which they pass to a common exit 15.

In the operation of my device, the hot gases from the burner 4 pass into the opening 13 and strike the baffle 11. Most of them are diverted and pass around the baffle, in contact with the outer walls of the member 10, but a small portion pass through the opening 12, directly into the flue. The gases then pass up through the flue 5, being continually thrown from one side to the other so as to bring them, at every angular portion, into contact with the walls of the flue 5, and thus under the best conditions to transmit their heat to the water outside the flue. If, however, the partition 7 is not retained in the center of the flue 5, I have found that there is a strong tendency for all the gases, or by far the greater portion of them, to pass up on one side of the partition, thus leaving the other side of the flue much less efficient in its transmission of heat. For this reason, as already stated, I have provided the means described for retaining the partition 7 in the center of the flue.

I claim as my invention, and desire to secure by Letters Patent:

1. In a water heater of the character described, provided with a central flue for the escape of

burner gases, a zigzag partition mounted substantially in the center of said flue and completely spaced from the wall thereof throughout its length so as to divide the flue into two substantially equal parts and to provide a space for the gases entirely surrounding the partition, the lower end of said partition being disposed centrally of the flue and means for retaining said partition in said position.

2. In a water heater of the character described, provided with a central flue for the escape of burner gases, a zigzag partition mounted substantially in the center of said flue and completely spaced from the wall thereof so as to divide the flue into two substantially equal parts and to provide a space for the gases entirely surrounding the partition; and means for supporting said partition in said position, said means comprising means for preventing longitudinal motion of said partition and means for stiffening said partition so as to prevent lateral motion.

3. In a water heater of the character described, provided with a central flue for the escape of burner gases, a zigzag partition mounted substantially in the center of said flue and completely spaced from the wall thereof so as to divide the flue into two substantially equal parts and to provide a space for the gases entirely surrounding the partition, and means for supporting the partition in said position, said means including transverse supporting rods within the flue to which the partition is secured at its ends, and means for stiffening the partition intermediate its ends to prevent lateral motion thereof, said last mentioned means comprising longitudinal corrugations at the angle portions of the partition.

4. In a water heater of the character described, provided with a central flue for the escape of burner gases, an enlarged spheroidal member mounted in said flue in such manner as to furnish a greater surface for the transmission of heat from the flue gases to the surrounding water, said member having an internal baffle plate supported

within it so as to leave passage for the escape of gases and bring them into closer contact with the walls of said member, said baffle being polygonal in shape and supported at its angular marginal portions upon the marginal portion of the lower concave wall of said member.

5. In a water heater of the character described, provided with a central flue for the escape of burner gases, an enlarged spheroidal member mounted in said flue in such manner as to furnish a greater surface for the transmission of heat from the flue gases to the surrounding water, a baffle supported within the spheroidal member with marginal portions thereof spaced from the wall of the spheroidal member to leave passage for the escape of gases and bring them into closer contact with the wall of said member, said baffle being convex at its under side and having a relatively small central opening to permit the passage of a relatively small portion of the flue gases.

6. In a water heater of the character described, provided with a central flue for the escape of burner gases, a zigzag partition mounted substantially in the center of said flue so as to divide the flue into two substantially equal parts, the lower end of said partition being disposed centrally of the flue, an enlarged spheroidal member mounted in said flue in such manner as to furnish a greater surface for the transmission of heat from the flue gases to the surrounding water, said spheroidal member being located below said zigzag partition, and a baffle supported within the spheroidal member with marginal portions thereof spaced from the wall of the spheroidal member to leave passage for the escape of gases and bring them into closer contact with the wall of said spheroidal member, said baffle being convex at its under side and having a relatively small central opening disposed in vertical alignment with the lower end of the zigzag partition to permit the passage of a relatively small portion of the flue gases.

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