

No. 676,192.

Patented June 11, 1901.

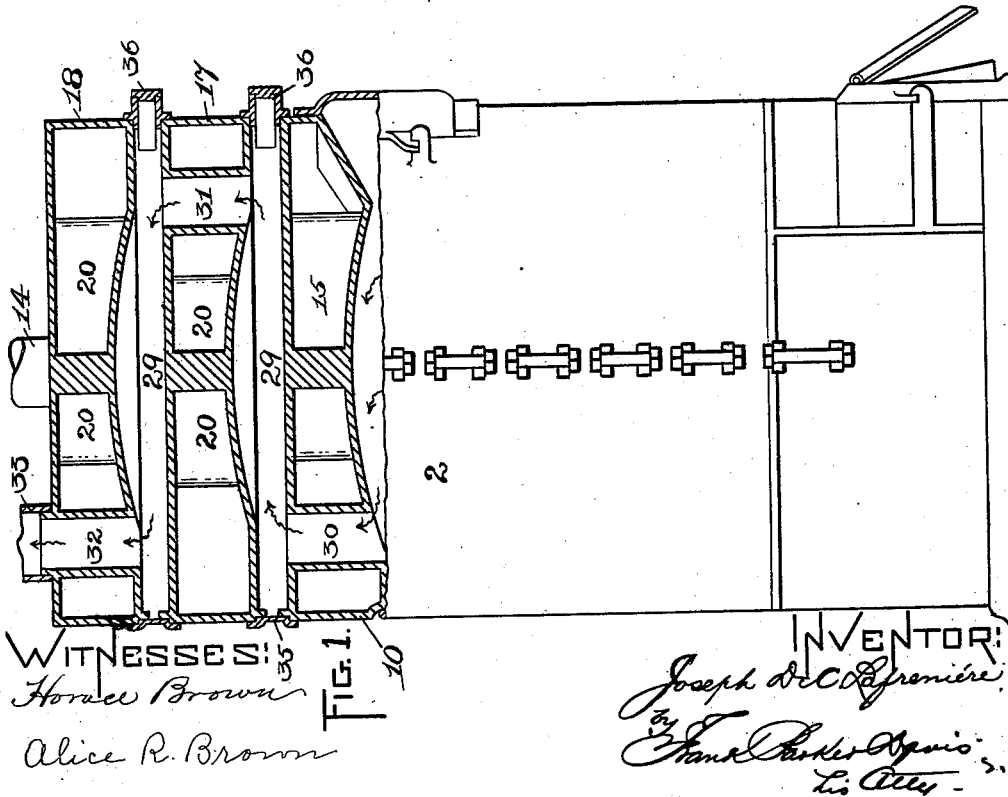
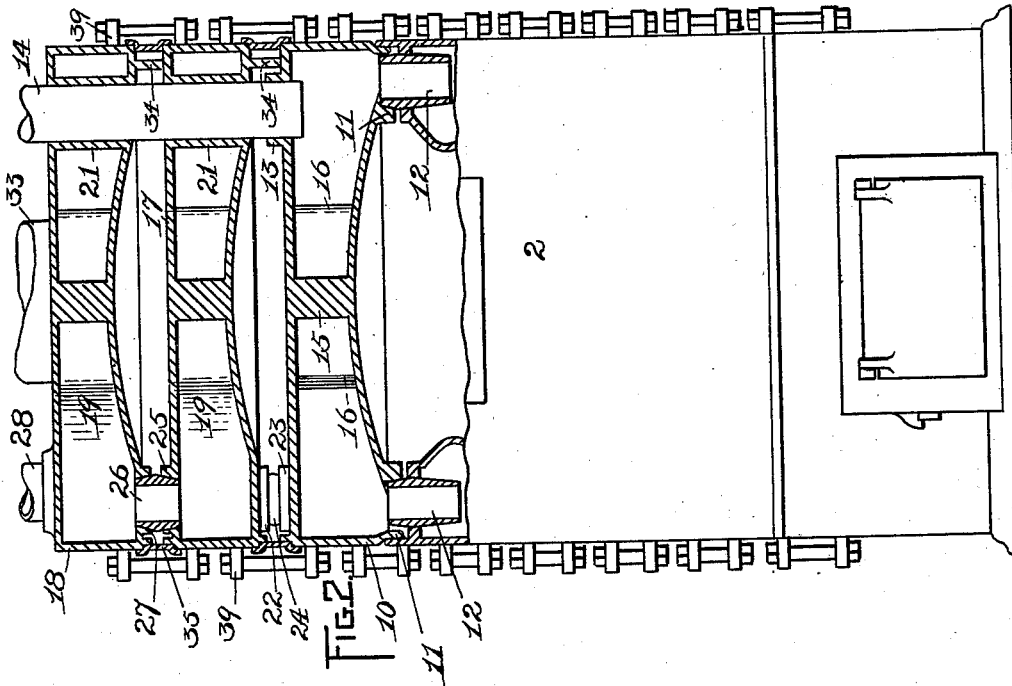
J. DE C. LAFRENIÈRE.

WATER HEATING AND CIRCULATING APPARATUS.

(Application filed Nov. 28, 1900.)

2 Sheets—Sheet 1.

(No Model.)



WITNESSES:

Horace Brown

Alice R. Brown

FIG. 1.

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No. 676,192.

Patented June 11, 1901.

J. DE C. LAFRENIÈRE.

WATER HEATING AND CIRCULATING APPARATUS.

(Application filed Nov. 23, 1900.)

2 Sheets—Sheet 2.

(No Model.)

FIG. 3.

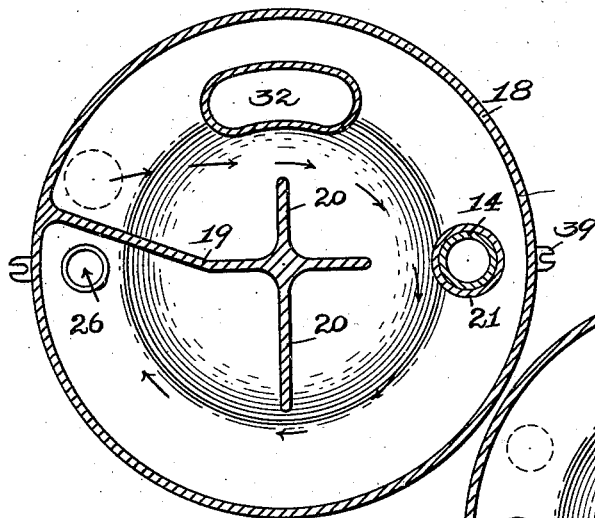


FIG. 4.

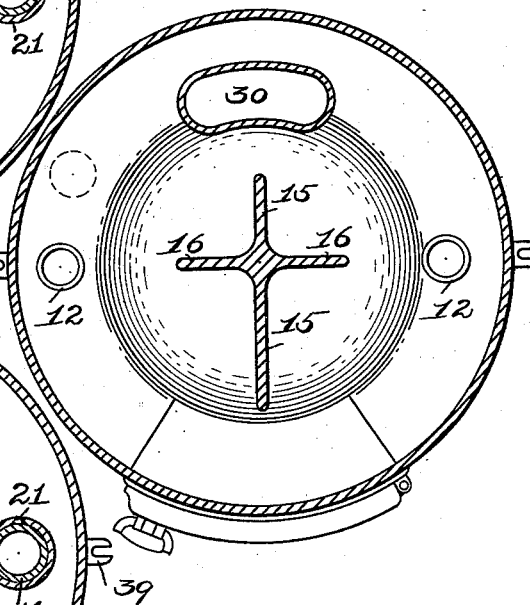
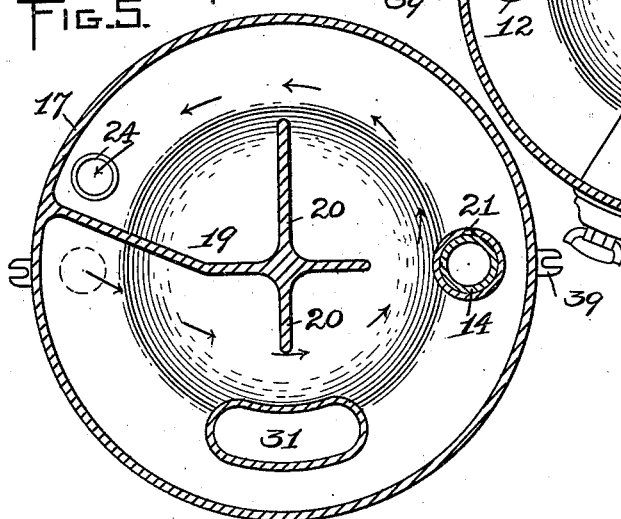


FIG. 5.



WITNESSES:

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INVENTOR:

Joseph de C. Lafrenière
by *Charles Parker Davis*
His Atty.

UNITED STATES PATENT OFFICE.

JOSEPH DE C. LAFRENIÈRE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO PERCIVAL W. ELLIOTT, OF SAME PLACE.

WATER HEATING AND CIRCULATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 676,192, dated June 11, 1901.

Original application filed September 15, 1900, Serial No. 30,107. Divided and this application filed November 23, 1900.
Serial No. 37,492. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH DE C. LAFRENIÈRE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Water Heating and Circulating Apparatus, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which it appertains or with which it is most nearly connected to make and use the same.

This invention has relation to steam-generating and hot-water-heating means generally, and particularly heaters for systems designed for warming dwellings, office-buildings, and the like.

The present application is a division of that filed by me, September 15, 1900, Serial No. 30,107.

The object of the invention is to effectually preheat the return-water without disturbing the circulation in a water fire-box, and this is accomplished by providing a superstructure designed to be heated by the products of combustion which would otherwise pass off to the chimney and be wasted, said superstructure having circuitous passage-ways which the return-water must traverse before it reaches the water fire-box, and these passage-ways being separated from that through which the hot water or steam passes out to the heating system, the steam or hot-water outlet being, however, preferably from the lower part of the superstructure, though it may be directly from the uppermost part of the water fire-box.

The drawings which accompany and form part of this specification illustrate a preferred form of embodiment of the invention and of said drawings.

Figures 1 and 2 represent the superstructure in cross-section, one view being taken at right angles to the other and the water fire-box being shown in elevation. Figs. 3, 4, and 5 represent the members of the superstructure in horizontal section.

The superstructure for heating the return-water from the system comprises a tier of hollow disks, the lower one, 10, of which is formed with bosses 11 at opposite sides, receiving nipples 12, which depend within the

water fire-box and which may or may not be of the construction shown in my said application of September 15, 1900. This disk 10 has a boss 13 on its top at one side, receiving the lower end of a pipe 14, which opens into the upper part of the disk above the nipple 12 and constitutes the outtake-conduit for the hot water. A partition 15 is provided within the disk 10 in the form of a web, extending from near the front to near the rear, lateral wings 16 being provided for strengthening purposes. This partition serves the purpose of preventing such commingling of the return-water entering the disk with the heated water flowing therefrom to the pipe 14 as might otherwise be calculated to disturb the circulation. At the same time any water attaining the degree of heat of the upward-moving column is free to join the latter in the disk. Two hollow disks 17 and 18 are shown surmounting the disk 10, each being of practically the same formation interiorly and exteriorly. In each there is formed a partition or deflector 19, springing from one side and extending obliquely toward the center and thence diametrically across the latter, terminating short of the opposite side of the disk, as clearly shown in Figs. 3 and 4. Wings 20 extend from the front and back of this diametrical portion of the partition, the front wing being somewhat longer than the rear one. Alining sleeves 21 are formed in these upper disks, and the pipe 14 extends through said sleeves to join the piping of the heating system. At the opposite side the middle disk 17 is formed with a boss 22 on the bottom, coming directly over a boss 23 on the disk 10, and a short pipe-section or nipple 24 fits in said bosses and provides communication for return-water between the two disks, said nipple opening into the middle disk in rear of its partition or deflector 19, so that the return-water must reach said nipple behind said partition. A boss 25 is formed on top of said disk 17 to receive a nipple 26 forward of said partition 19, and the top disk 18 has a corresponding boss 27 on its bottom to receive said nipple, which provides communication between the disks 17 and 18 for the return-water. It will be seen that the latter enters the disk 17 in front of the partition and must

travel entirely around the interior of the disk to reach the nipple 24, as indicated by the arrows in Fig. 4, wherein the nipple 26 is indicated by dotted lines. The reference-number 28 designates the return-pipe from the heating system, which pipe enters the top of the disk 18 in the rear of the partition 19, so that the water must flow entirely around the interior of the disk before it finds an outlet at the nipple 26. The bottoms of the disks are concave, and the disks are sufficiently separated to provide heating-chambers 29, through which products of combustion pass to the chimney. The lower disk 10 has a smoke-flue 30 at the rear, leading from the fire-box chamber to the chamber between this disk and the disk 17, and the latter has a smoke-flue 31 at the front, leading from said chamber to the chamber between the disks 17 and 18, and the latter has a smoke-flue 32 at the rear, leading to the chimney-flue 33. It will be seen that by this arrangement the three disks are thoroughly subjected to the heat of the products of combustion passing upward from the fire-box and that the return-water will be effectively heated before reaching the tubes.

The disks 17 and 18 are supported at one side by the connecting nipples and bosses and at the opposite side by legs 34, formed upon the bottoms of these disks and resting on the disks below. The heating-chambers 29 are closed at the sides by flanged bands 35, having clean-out openings with doors, as shown at 36 in Fig. 1. The disks are clamped together by means of lugs 39, formed upon them, and bolts and nuts engaging the lugs.

It will be seen that the construction herein described is well calculated to thoroughly fulfill the object primarily stated.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all the forms in which it may be made or all the modes of its use, it is declared that what is claimed is—

1. In a heater of the character described, the combination with a water fire-box; of a return-water-heating structure surmounting said fire-box and comprising a number of superposed communicating hollow disks with passage-ways between them for products of combustion, the lower one of which disks communicates at opposite sides with the top part of the water fire-box; an outtake-pipe in direct communication with said lower disk; and a return-water pipe entering the uppermost hollow disk; all of the disks being in communication for the circulation of the return-water while the outflow of heated water is only from the lowermost disk, substantially as described.

2. In a heater of the character described, the combination with a water fire-box; of a return-water-heating structure surmounting said fire-box and comprising a number of superposed hollow disks with passage-ways be-

tween them for products of combustion, the lowermost one of which disks communicates at opposite sides with the top part of the fire-box, all of the disks communicating with each other at the same side and the upper ones having deflectors for causing the return-water to traverse their interiors; an outtake-pipe in direct communication with the lowermost disk at one side thereof; and a return-water pipe entering the uppermost disk; all of the disks being in communication for the circulation of the return-water while the outflow of heated water is only from the lowermost disk, substantially as described.

3. In a heater of the character described, the combination with a water fire-box; of a return-water-heating structure surmounting said fire-box and comprising a number of superposed communicating hollow disks with passage-ways between them for products of combustion, the lower one of which disks communicates at opposite sides with the top part of the water fire-box; an outtake-pipe leading from said lower disk and extending up through the disks thereabove; and a return-water pipe opening into the uppermost hollow disk.

4. In a heater of the character described, the combination with a water fire-box; of a return-water-heating structure surmounting said fire-box and comprising a number of superposed communicating hollow disks with passage-ways between them for the products of combustion, the lower one of which disks communicates at opposite sides with the top part of the water fire-box and has a partition extending partially across its interior between said points of communication with the water fire-box; an outtake-pipe leading from said lower disk and a return-water pipe opening into the uppermost hollow disk.

5. In a heater of the character described, the combination with a water fire-box; of a superstructure for heating return-water, the same comprising one or more hollow disks, each with offset inlet and outlet ports in top and bottom respectively and a vertical partition or deflector extending from top to bottom between them to cause water entering the disk to travel around the same before passing out; a lower disk in communication with the outlet from the next disk above, and in communication at opposite sides with the top part of the water fire-box; an outtake-pipe leading from said lower disk; and a return-water pipe leading into the inlet-port of the uppermost disk.

6. In a heater of the character described, the combination with a water fire-box; of a return-water-heating structure surmounting said fire-box and comprising a number of superposed communicating hollow disks with passage-ways between them for products of combustion, the lower one of which disks communicates with the top part of the water fire-box at one side thereof; a return-water pipe entering the uppermost hollow disk, the com-

munication between the disks providing for the flow of the return-water circuitously to the water fire-box; and an outtake-pipe arranged to receive and carry off the heated
5 water as it comes from the top of the fire-box at the side opposite that where the lower disk discharges return-water into said fire-box, substantially as described.

7. In a heater of the character described,
10 the combination with a water fire-box; of a superstructure for heating return-water, the same comprising one or more hollow disks, each with offset inlet and outlet ports in top and bottom respectively, and a vertical parti-
15 tion or deflector extending from top to bottom between them to cause water entering the disk to travel around the same before passing out; a return-water pipe leading into

the inlet-port of the uppermost disk; a lower disk in communication with the outlet from 20 the next disk above and also in communication with the top part of the water fire-box at one side thereof; and an outtake-pipe arranged to receive and carry off the heated
25 water as it comes from the top of the fire-box at the side opposite that where the lower disk discharges return-water into said fire-box, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of 30 two subscribing witnesses, this 21st day of November, A. D. 1900.

JOSEPH DE C. LAFRENIÈRE.

Witnesses:

F. P. DAVIS,
HORACE BROWN.