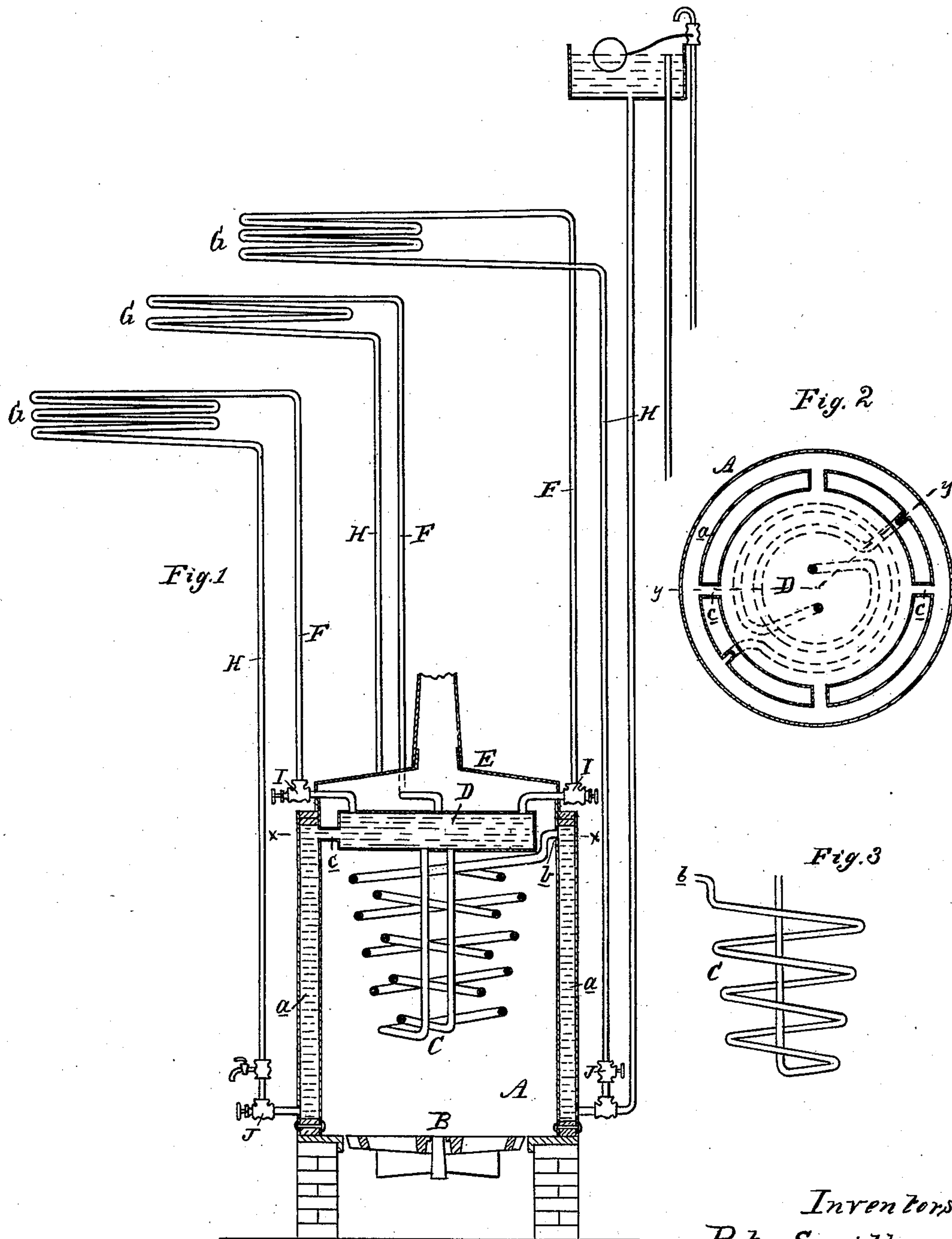


(No Model.)

P. SMITH & O. B. FULLER.
CIRCULATING HOT WATER SYSTEM.

No. 358,228.

Patented Feb. 22, 1887.



Attest:
John Schuman.
Notary Public

Inventors:
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and
Olney B. Fuller.
by Atty
Thos. J. Sprague

UNITED STATES PATENT OFFICE.

PETER SMITH AND OLNEY B. FULLER, OF DETROIT, MICHIGAN, ASSIGNORS
TO THE SMITH & OWEN HEATER COMPANY, OF SAME PLACE.

CIRCULATING HOT-WATER SYSTEM.

SPECIFICATION forming part of Letters Patent No. 358,228, dated February 22, 1887.

Application filed May 10, 1886. Serial No. 201,670. (No model.)

To all whom it may concern:

Be it known that we, PETER SMITH and OLNEY B. FULLER, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Circulating Hot-Water Systems; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in the construction and operation of circulating water-heaters; and it consists in the peculiar construction of the various parts and their combinations and operation, as more fully hereinafter described and claimed.

Figure 1 is a vertical section of a boiler for a circulating hot-water system on the line *yy* of Fig. 2, and showing its connections. Fig. 2 is a cross-section on the line *xx*, Fig. 1. Fig. 3 is a detached view of one of the coils.

In the accompanying drawings, A represents a double-shell boiler having an annular water-space, *a*. This boiler is provided with a grate, B, at the bottom of its combustion-chamber, which is inclosed by the inner shell or wall of the boiler.

C represents a coil of pipe, one end, *b*, of which is connected and in communication with the water-space of the boiler at or near its top. This pipe is bent from its connecting-point into the form of a coil, said coil diminishing in diameter with each successive revolution, as shown, and said pipe then turned up vertically through the center of the coil, or nearly so, its upper end terminating at a point upon the same plane, or nearly so, with the starting-point.

D is a tank, which may be located within the top E of the boiler, or outside the same, as may be desired; but as in the drawings it is shown as located within the top or smoke-jacket E of the boiler the description will here be confined to the device shown, wherein the tank at opposite sides is connected by pipes *c* with the water-space of the boiler, near the upper end thereof, so that there will be a perfect circulation through the boiler and tank under all circumstances, whether the cir-

culating water-pipes outside the boiler are in operation or not. The vertical part of the coil-pipe communicates with the water-space in the tank, and is suspended within the combustion-chamber above the grate. The space between the lower end of the coil and the top of the grate forms properly the furnace.

F are ascending pipes, the lower ends of which lead into the top of the tank D. The upper ends of these pipes each connect with a coil of circulating-pipes, G, from each of which there descends a descending pipe, H, the lower end of which leads into the water-space of the boiler near its lower end. Each ascending pipe is provided with a suitable valve, I, and each descending pipe with a similar valve, J, by means of which the circulation may be cut off from either one of the circulating-coils, as desired, without disturbing the circulation through any of the other circulating-coils or through the boiler and tank.

In practice the boiler, tank, coils in the boiler, ascending and descending pipes, and their attached radiators or coils are filled with water from which the air has been boiled and a fire made in the furnace. The water in the suspended coils, of which latter there may be as many as desired, and in the adjacent part of the boiler becomes heated, and, expanding, rises into the tank and thence through the ascending pipes, connecting radiators, and descending pipes, displacing the colder water therein and forcing it into the boiler.

Each of the radiators G is supposed to be located in a different room. Now, if it is desired to have no artificial heat in one of these rooms, the circulation of hot water for that room is instantly stopped by closing the valves in the ascending and descending pipe communicating with the radiator in that room, and this does not affect the circulation through the balance of the system.

What we claim as our invention is—

The apparatus described, consisting of the boiler A, having water-space *a*, tank D, pipes *c*, connecting said tank and water-space, coil C, having one end connected with said water-space near its top and its other end extended upward through the coil and connected with the tank, ascending pipes F, each independ-

ent of the other and having end connected with the tank, circulating-pipes G, connected with the upper ends of said pipes, descending pipes H, connecting said circulating-pipes
5 with the lower part of the water-space, valves I, one for each ascending pipe, and valves J, one for each descending pipe, all combined,

arranged, and operating substantially as and for the purpose specified.

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OLNEY B. FULLER.

Witnesses:

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