

(No Model.)

E. HOSFORD.

BOILER FOR HEATING WATER FOR BATHING OR OTHER PURPOSES.

No. 358,271.

Patented Feb. 22, 1887.

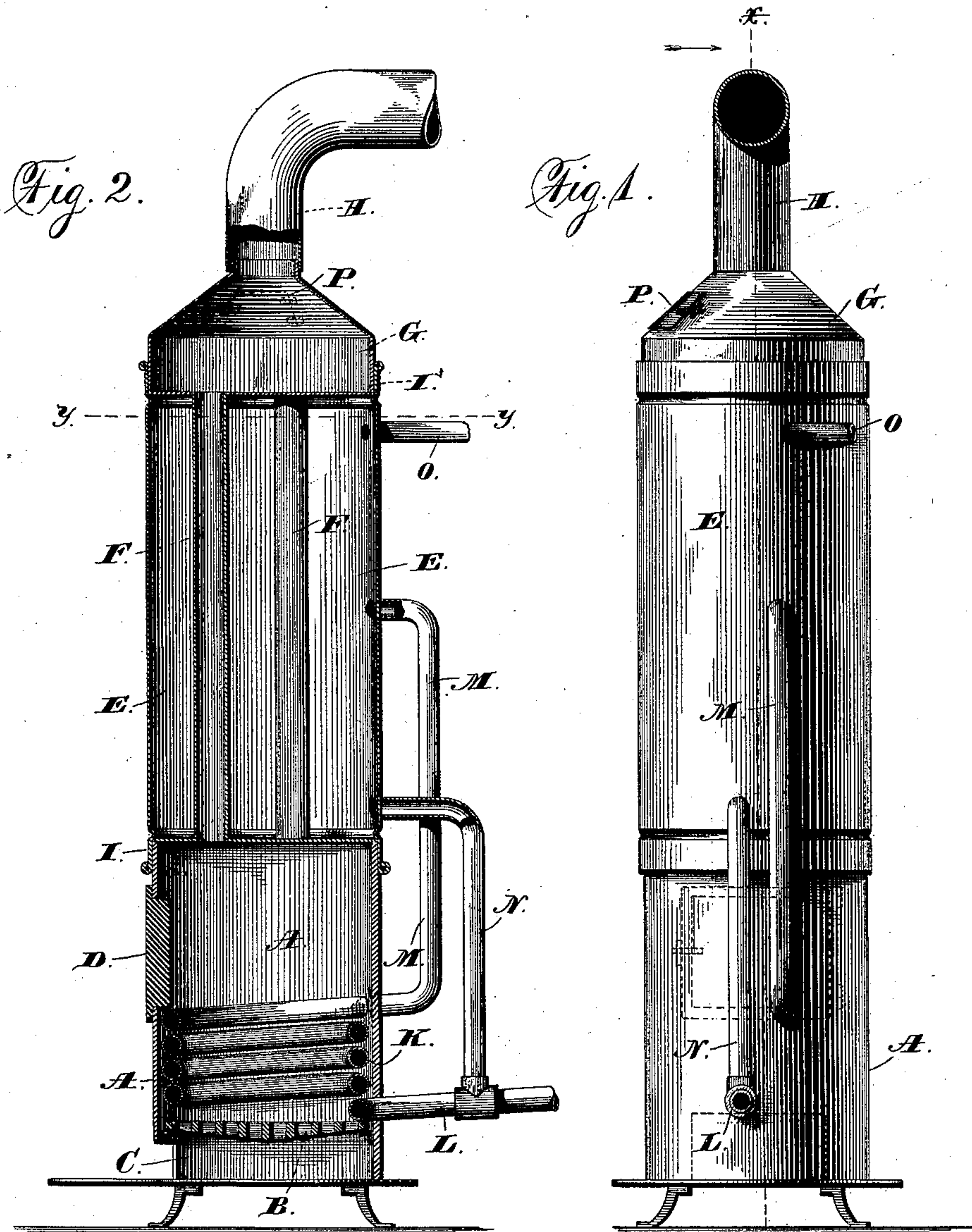
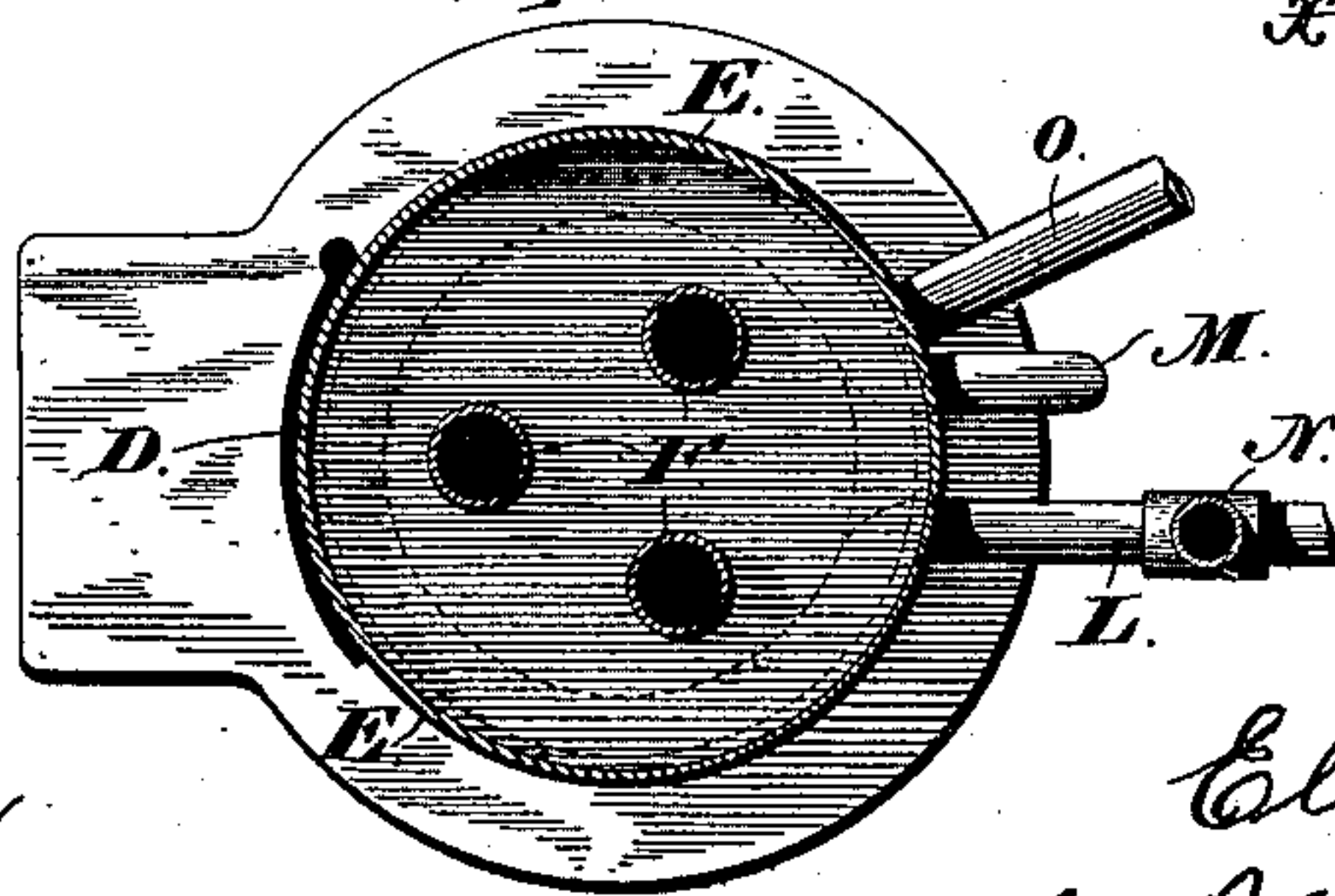


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ELIHU HOSFORD, OF OAKLAND, CALIFORNIA.

BOILER FOR HEATING WATER FOR BATHING OR OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 358,271, dated February 22, 1887.

Application filed April 28, 1885. Serial No. 163,783. (No model.)

*To all whom it may concern:*

Be it known that I, ELIHU HOSFORD, a resident of Oakland, Alameda county, State of California, have invented an Improved Boiler for Heating Water for Bathing, Laundry, and Culinary Purposes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 shows a view of my water-heating apparatus in elevation. Fig. 2 shows a vertical section of the same on line *x x* of Fig. 1, the pipes M and N being broken away, and Fig. 3 a horizontal section of the same on line *y y* of Fig. 2.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide cheap, convenient, and ready means for heating water for bathing, washing, heating, or other purposes, which shall heat the water quickly and thoroughly, maintain it at a high temperature, and furnish it continuously, as desired, at such temperature; and with these ends in view my invention consists in the heater and in the construction and combination of its parts, as hereinafter set forth.

In the drawings, A designates the fire box or chamber, which can be of any desired construction or form, but is preferably made cylindrical, as shown. The body of an ordinary cylindrical iron stove, such as is well known in the market, can be used to furnish the fire-box. At the bottom of this chamber or fire-box is the usual grate, B, below which is the ash box or chamber C. At one side of the fire box or chamber is the door D, for the admission of fuel.

Upon the open upper end of the fire-chamber A is set the upright boiler E, up through which extend the several flues F F, for conducting the heated air, gases, and products of combustion up through the boiler into the uptake or flue-chamber G on top of the boiler, from which uptake the flue-pipe H extends.

The boiler can be secured in any desired way upon the top of the fire-chamber; but I prefer to secure it in place thereon by means of the flange or downward extension I around the boiler-bottom. Such flange embraces closely the top of the chamber-casing, as shown, thus

giving the boiler a good firm seat. This flange can obviously, if desired, be riveted or otherwise fastened to the chamber-casing. At the upper end of the boiler is a similar upwardly-extending flange or rim, I', for the reception of the lower end of the flue or uptake chamber or hood G.

Instead of lining the fire-chamber with fire-brick where the fire is to be, as is usually done, I line it with a coil of pipe, K, with whose lower end is connected the water-supply pipe L, connected with any source of supply of water to be heated.

The upper end of coil K is connected, by means of pipe M, with the interior of the boiler E, at some distance above the bottom thereof. In the drawings this pipe is shown as entering the boiler about midway of its height. Said pipe is also shown as connected with the coil K through the side of the casing of fire-chamber C, and as extending upward outside of the chamber and boiler. I contemplate, however, where desired, running such pipe up within the fire-box and through the boiler-bottom, so that its upper end shall stand within the boiler at some distance above the bottom thereof.

From the bottom of the boiler extends the pipe N, connected at its lower end with the supply-pipe L. A pipe, O, tapped into the boiler, as shown, at or near its top, is for the purpose of taking the heated water from the upper portion of the boiler and conducting it to the place at which it is to be used.

The operation of my heating apparatus is as follows: Water, being admitted through supply-pipe L, fills coil K and, rising up in pipe M, runs into and fills boiler E, where it surrounds and is in contact with the flues F F. Meantime the pipe N, connecting the lower portion of the boiler, also, of course, becomes filled. The boiler being filled, the water will then run from the top thereof off through pipe O. If, now, a fire be built in the fire-chamber, the coil K, being full of water, protects the walls of the chamber from the direct action of the fire, just as a fire-brick lining would, and at the same time by the heating of the coil the water within it is heated very hot. The water thus heated flows up through pipe M from the top of the coil up into the boiler. Meantime the water already in the boiler surrounding the flues F F is heated by



heat from the gases and products of combustion passing from the fire up through the flues. The heated water in and that flowing into the boiler naturally rises to the top of the latter, while the colder water sinks to the bottom of the boiler. From there it is drawn off by pipe N and discharged into the supply-pipe. Through such latter pipe it enters the lower end of the heating-coil K. If the water from the source of supply is turned on and is running into the coil K, the water coming down from the boiler E mingles with this supply-water, and they enter the coil together. Only the hottest water is taken off by the service-pipe O, as such water is of course bound to flow to the highest part of the boiler. When the water is not being used or drawn off through pipe O, there will still be a constant circulation of water from the supply-pipe through the coil K and through pipe L into the boiler, and from the boiler through pipe N back into the supply-pipe again. While the greatest heat is imparted to the water during its passage through the coil K, the flues F serve to impart considerable heat to the water in the boiler itself, and keep it hot. When hot water is being drawn from the boiler for use, and the cool water is flowing into the coil K through the supply-pipe L, the water flowing down from the boiler through the pipe N mingles with the supply-water in the supply-pipe and imparts some of its heat to it, so that the water which reaches the coil K is warmed up or heated before striking the heated portions of the coil.

35 In the side of the flue-chamber or uptake G

I prefer to place a door, P, through which the interior of such chamber and of the flues F, F, and H can readily be reached for cleaning.

Having thus described my invention, what I claim is—

1. In combination with the fire-box and the boiler above the same provided with flues extending up through it, the coil of pipe forming a lining for the fire-box and having its upper end connected by a suitable pipe with the interior of the boiler at some distance above the bottom thereof, the water-supply pipe connected with the lower end of the coil, the pipe opening from the boiler at or near its bottom and connected with the supply-pipe, and the pipe tapped into the boiler near its top, substantially as and for the purpose specified.

2. In combination with the fire-box with the open top, the boiler on top of the fire-box having one or more flues extending up through it, the coil of pipe in the fire-box, a section of pipe extending from the upper end of the coil and opening into the boiler at a distance above the bottom thereof, a water-supply pipe connected with the lower end of the pipe coil, the pipe extending from the lower end of the boiler and connected with the supply-pipe outside of the fire box or chamber, and a suitable hot-water-discharge pipe opening from the upper part of the boiler, substantially as and for the purpose shown.

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Witnesses:

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