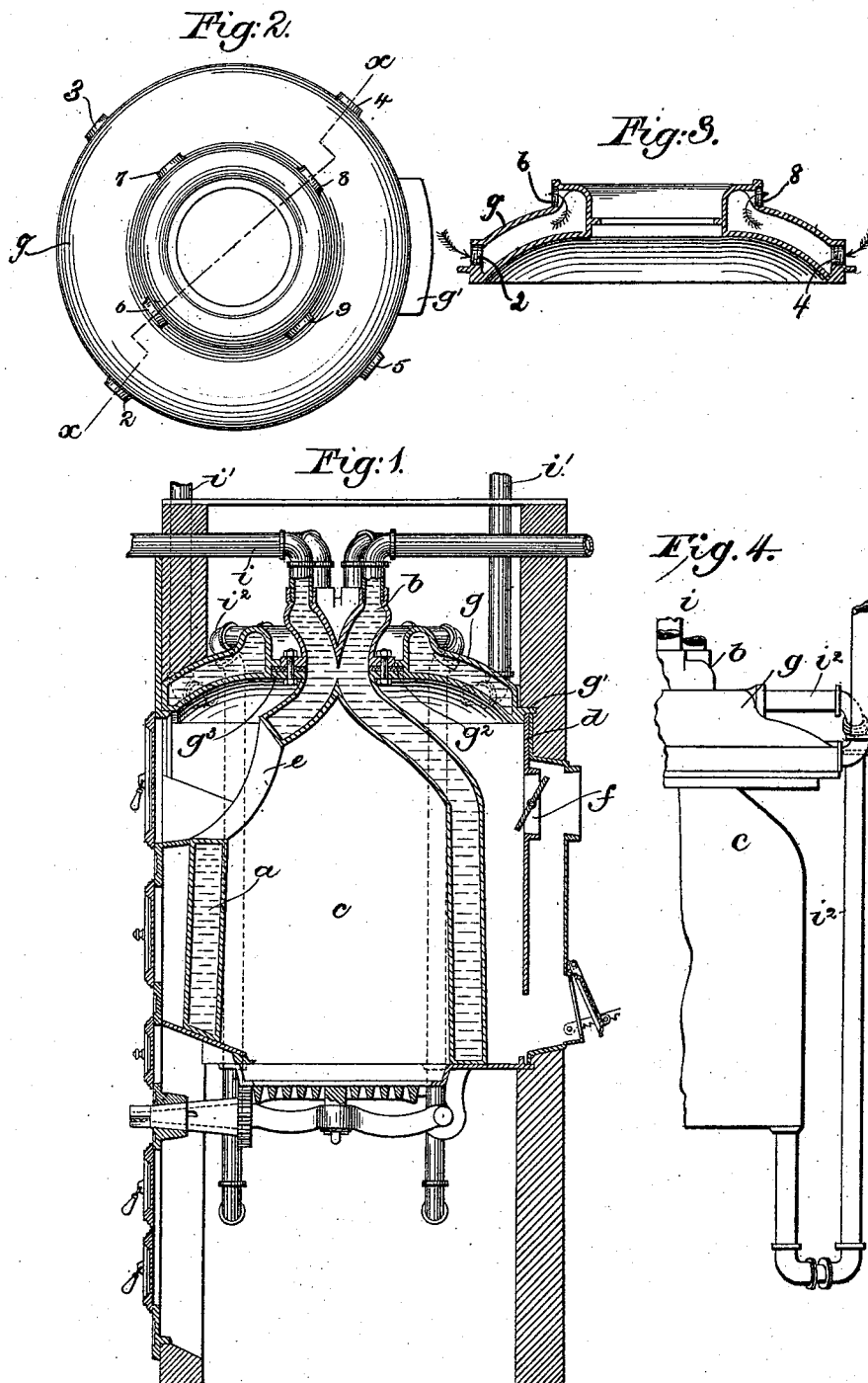


(No Model.)

J. M. THAYER.
HOT WATER HEATING APPARATUS.

No. 456,328.

Patented July 21, 1891.



Witnesses.

Hynd S. Greenleaf.
Geo. C. Huntington.

Inventor

James M. Thayer.
by Lemby Gregory attys.

UNITED STATES PATENT OFFICE.

JAMES M. THAYER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE THAYER HEATER COMPANY, OF PORTLAND, MAINE.

HOT-WATER HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 456,328, dated July 21, 1891.

Application filed October 2, 1890. Serial No. 366,821. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. THAYER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Hot-Water Heating Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to provide a hot-water heating apparatus—such, for instance, as shown in the United States Patent No. 378,633, dated February 28, 1888—with suitable means for heating the return-water
15 just before it enters the boiler, and also to accomplish such result economically by placing such means in the combustion-chamber.

In carrying out this invention a water-top, preferably made convex, is placed in the outer
20 combustion-chamber, and preferably forming the top side wall thereof. The return-circulation pipes are arranged to enter the said water-top at the bottom, and pipes lead from said water-top to the bottom of the boiler, so
25 that the water returning to the boiler passes through this water-top.

Figure 1 shows in vertical section a hot-water heating apparatus embodying this invention; Fig. 2, a plan view of the water-top; Fig.
30 3, a sectional detail of the water-top shown in Fig. 2, taken on the dotted lines *xx*; and Fig. 4, a partial side elevation of the heating apparatus shown in Fig. 1.

The boiler *a* is of any usual or suitable construction, having the distributor *b*, substantially as shown in the patent referred to.

The boiler *a* is circular and forms within it a combustion-chamber *c*, and said boiler is placed in a casing or frame-work *d*. The products of combustion pass through the opening *e* into the interior of the casing or frame
40 *d*, which forms an outer combustion-chamber, and pass out of the said chamber through the flue-pipe *f*. A water-top *g* is placed in the
45 outer combustion-chamber, it being herein represented as forming the top side wall of said chamber and also as being convex and annular. The water-top is substantially circular in shape and has a peripheral flange *g'*,
50 which rests upon the side walls of the frame or casing *d*, and has also a flange *g''* at its

open center, which rests on a flange *g'''* of the boiler. The water-top *g* preferably has a plurality of inlets, four, as 2 3 4 5, being herein shown, and also a plurality of outlets, four, 55 as 6 7 8 9, being herein shown.

Circulation-pipes, as *i*, lead from the top of the boiler *a*—as from the distributor *b*, for instance—and return by return-pipes *i'* to the bottom of the water-top *g*. 60

A pipe or pipes, as *i''*, lead from the top of the water-top *g* to the lower part of the boiler *a*, four such connecting-pipes *i''* being herein employed.

The water passing out the distributor *b* 65 through the circulation-pipes *i* returns through the pipes *i'* to the lower part of the water-top *g* and thence through the connecting-pipes *i''* to the lower part of the boiler *a*, so that the water passing out of the boiler and returning 70 passes through the water-top just prior to entering the boiler.

I do not desire to limit myself to the number of pipes leading to or from the water-top.

I claim—

1. In a hot-water heating apparatus, a boiler, a combustion-chamber within it, an outer casing, as *d*, and an outer combustion-chamber arranged between the outer casing and boiler, combined with an annular water-top placed 80 above and closing the top of the outer combustion-chamber and heated therefrom, circulation-pipes leading from the boiler and returning to the water-top, and a pipe leading from the water-top to the boiler, substantially 85 as described.

2. In a hot-water heating apparatus, a boiler, a combustion-chamber within it, an outer casing, as *d*, and a combustion-chamber between the outer casing and boiler, combined with a 90 water-top forming the top of the outer combustion-chamber, and circulation-pipes leading from the boiler and returning to the said water-top, and pipes connecting the water-top with the lower end of the boiler, substantially 95 as described.

3. In a hot-water heating apparatus, a boiler, a combustion-chamber within it, an outer casing, as *d*, and a combustion-chamber between the outer casing and boiler, combined with a 100 convex water-top forming the top of the outer combustion-chamber, circulation-pipes lead-

ing from the boiler and returning to the water-top, and a pipe connecting the water-top with the lower part of the boiler, substantially as described.

5 4. In a hot-water heating apparatus, a boiler, a combustion-chamber within it, an outer casing, as *d*, and a combustion-chamber between it and the boiler, combined with a water-top, circulation-pipes leading from the boiler and
10 entering the water-top at the bottom, and a

pipe leading from the top of the water-top and entering the boiler at its lower end, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

JAMES M. THAYER.

Witnesses:

BERNICE J. NOYES,
EDITH F. GUILD.