

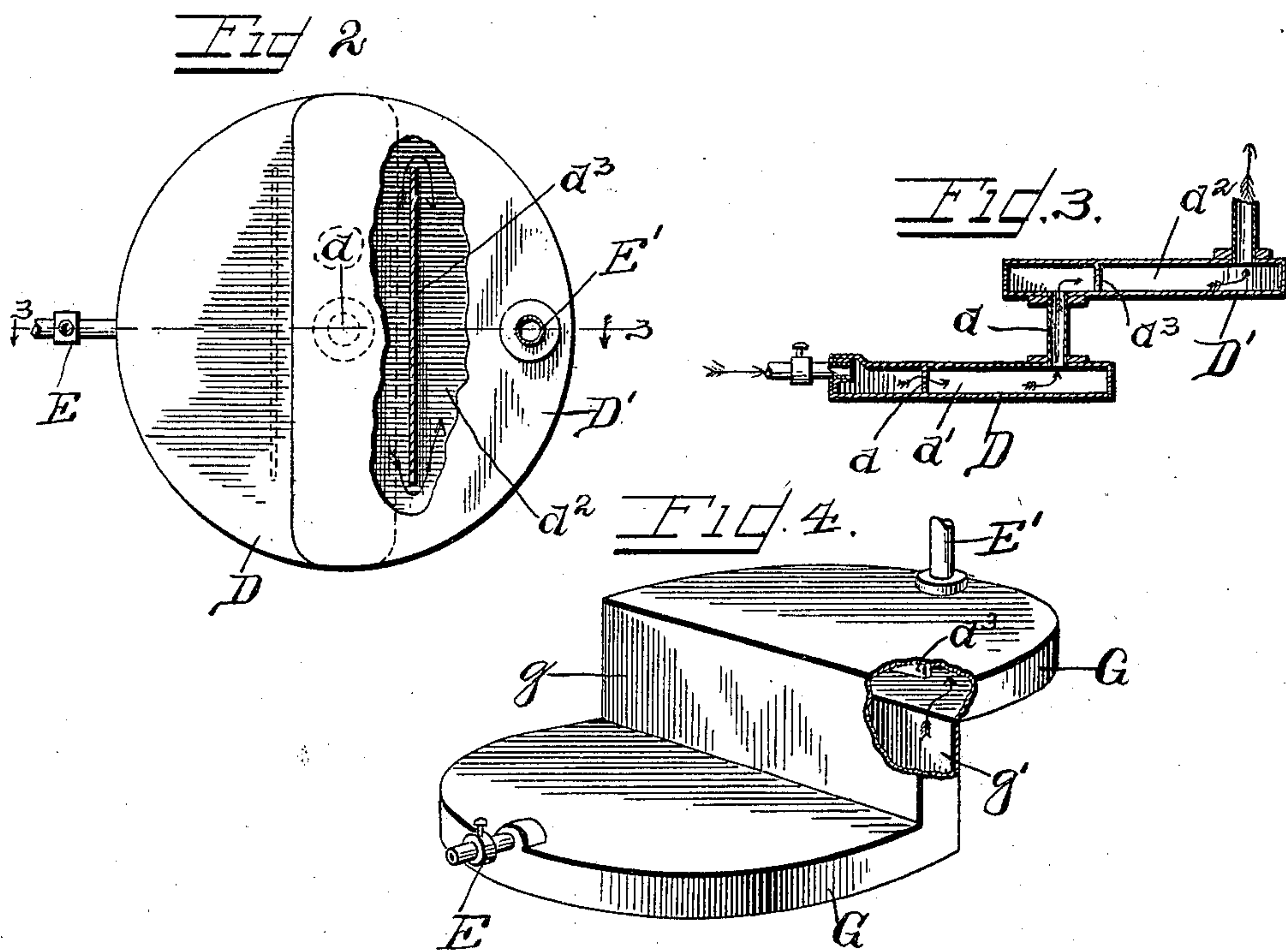
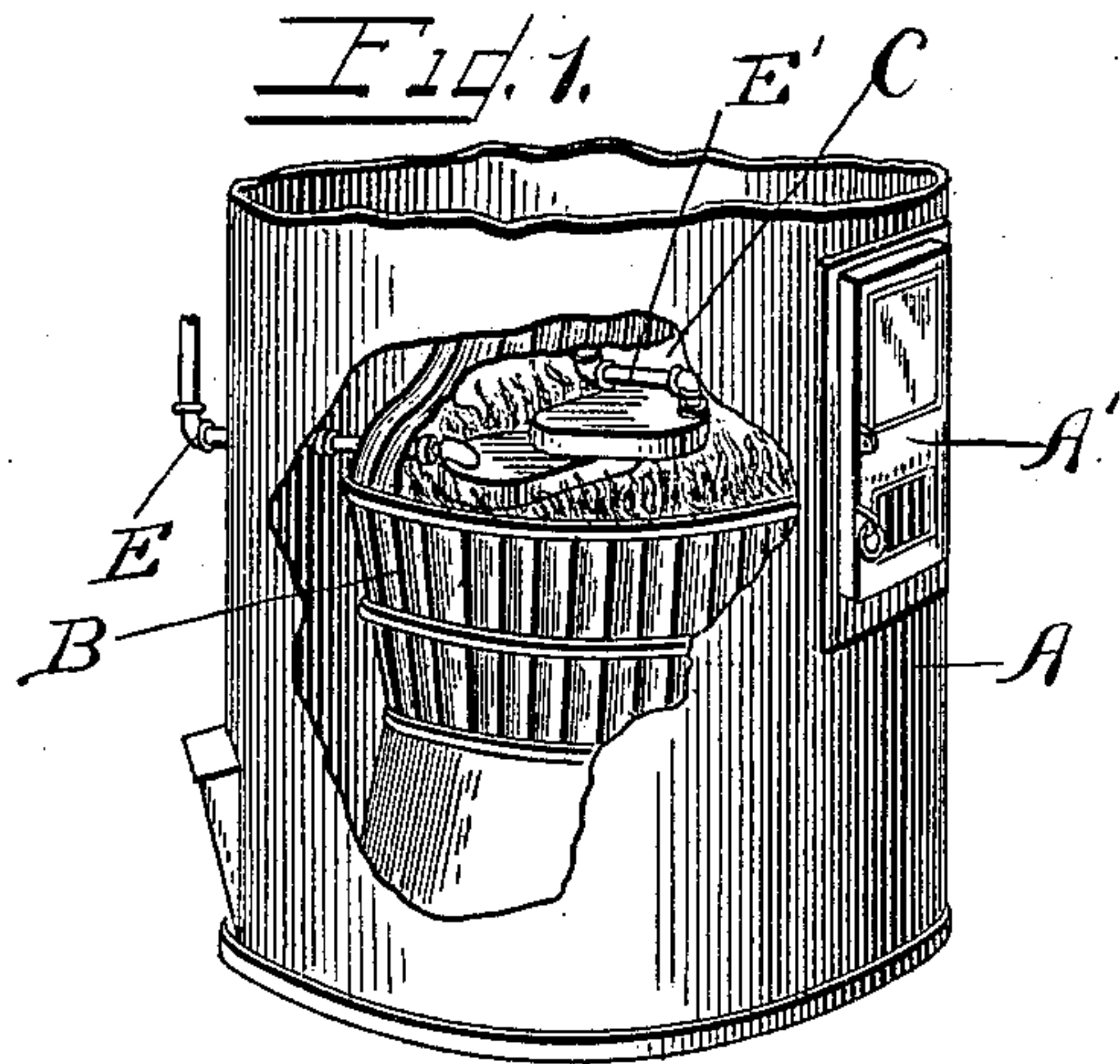
No. 685,029.

Patented Oct. 22, 1901.

R. F. BROWN.
HOT WATER HEATER.

(Application filed Jan. 10, 1901.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

ROYAL F. BROWN, OF CHICAGO, ILLINOIS.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 685,029, dated October 22, 1901.

Application filed January 10, 1901. Serial No. 42,709. (No model.)

To all whom it may concern:

Be it known that I, ROYAL F. BROWN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

My invention relates particularly to that class of hot-water heaters adapted to hot-water systems in which hot water is circulated through a dwelling or other building for the purpose of tempering the atmosphere, and especially to the means within the compass of a fire-box by which the water is heated for circulation, all of which will more fully hereinafter appear.

The principal object of the invention is to provide a simple, economical, and efficient hot-water heater; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a broken elevation of a hot-water heater constructed in accordance with my improvements; Fig. 2, a plan view of the chamber in which the water is heated broken away to show one of the circulating-partitions; Fig. 3, a sectional elevation taken on line 3 of Fig. 2; and Fig. 4, a modified form of chamber, as will be more fully hereinafter described.

In the art to which this invention relates it is well known that in order to economically heat the water it is desirable to have the chamber in which the water is heated located as close as possible to the point of combustion or intense heat, so that the direct heat as well as the radiant energy may be used to economically heat the water. In order to accomplish this result with the ordinary mechanism, such as a plain flat receptacle, and place it directly at the point of combustion, it would interfere somewhat with the draft of the furnace, as well as with the stoking of the same. My improvements therefore are intended primarily to provide a chamber in which the water may be heated and arrange it directly adjacent to the point of combustion of fuel, providing at the same time an arrangement by which the draft is not seriously impeded or the stoking of the furnace interfered with, all of which will more fully hereinafter appear.

In illustrating and describing my improvements I prefer to illustrate and describe them in connection with one kind of apparatus—viz., a furnace; but I have merely chosen this method to properly disclose the invention and enable those skilled in the art to practice the same and by whom it will be readily seen that my improvements may be applied and fitted to almost any kind of fire-box construction without any change or modification in the principles of the invention.

In constructing my improvements and using them in connection with a furnace having the outer walls A and inner portion B, which provides the fire box or chamber C, I make two receptacles D and D', which provide the water-heating chambers. These receptacles are semicircular in contour when looked at from above or below and are arranged in different horizontal planes, their chambers having communication with each other by means of the pipe d. These receptacles provide what may preferably be termed the "water-heating" chambers d' and d'', arranged in different horizontal planes, the chamber d' being the primary water-heating chamber, or the one in which the water at its greatest specific gravity—viz., cold water—is caught, and the chamber d'' being the secondary water-heating chamber—viz., the chamber into which the water is forced after being partially heated by the hydrostatic head of cool water—as will more fully hereinafter appear. These receptacles, which form the water-heating chambers, are arranged in the fire-box, as shown in Fig. 1, immediately over the bed of fuel and at or about the point of combustion—that is, where the elements rush together and unite chemically, which is ordinarily the hottest point. The receptacles are further arranged so that the one occupying the main elevated horizontal plane is adjacent to the door A', through which the fuel is fed into the furnace, so that it does not in any serious way offer an impediment or barrier to the stoking of the furnace. At the same time it permits the easy circulation of the gases in the furnace and does not impair the draft.

In operation the parts are arranged as shown in Fig. 1. The primary water-chamber is connected, by means of a pipe E, with the

highest point of the hot-water system, generally with a pressure-tank, (not shown,) while the other or secondary chamber is connected, by means of the pipe E', with the lowest point
 5 of the hot-water system. It will thus be seen that when the furnace is in operation the cold water, or water at its greatest specific gravity, enters the primary chamber to displace the water therein and force it into the secondary
 10 chamber, where it is further heated, and thus assists in forcing the hot water into the circulating system until it reaches the highest point, from which, owing to its greater specific gravity, it returns to the primary chamber.

15 With regard to the details of the invention I provide each of the heating-chambers with a baffle-plate or partition d^3 , which materially assists in the circulation of the water in that as it flows it impinges against these parti-
 20 tions, and as these partitions more readily conduct heat than the water it assists in raising the temperature of the water and making it lighter, thereby forcing the water, as shown in Fig. 2, toward the periphery of the cham-
 25 bers.

In Fig. 4 I have shown a modified form of receptacle for furnishing the primary and secondary water-heating chambers, in which the receptacles G and G' are connected to-
 30 gether by means of the integral walls g and g' , which furnish communication between the primary and secondary heating-chambers. In other respects they are the same as the receptacles described in connection with Figs.
 35 2 and 3.

I claim—

1. In a hot-water heater of the class described, the combination of two horizontal receptacles arranged in parallel planes one

above the other in juxtaposition and forming 40 primary and secondary water-heating chambers, a connection between the two chambers entering the lower chamber on its upper side or top and entering the upper chamber on its under side or bottom and furnishing a free 45 communication for one chamber with the other, and a fire-box having the two receptacles located therein at or in proximity to the point of combustion, substantially as de-
 50 scribed.

2. In a hot-water heater of the class described, the combination of two separated semicircular horizontal receptacles arranged in parallel planes one above the other in juxtaposition, and having communication with each 55 other, forming primary and secondary water-heating chambers, a pipe connecting the lower or primary heating-chamber with the hot-water system for the chamber to receive a supply of water at its coolest temperature, 60 and a pipe connecting the higher or secondary water-chamber with a hot-water system and providing for the circulation of the water, substantially as described.

3. In a hot-water heater of the class de- 65 scribed, the combination of two semicylindrical receptacles having communication with each other and arranged in two horizontal planes forming primary and secondary 70 water-heaters, means for connecting such chambers with a heating system, and vertical baffle-plates in each of such chambers to assist in heating and circulating the water therein, substantially as described.

ROYAL F. BROWN.

Witnesses:

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 R. P. BURTON.