

J. S. McCARTHY.
HEATER.

APPLICATION FILED NOV. 11, 1909.

979,527.

Patented Dec. 27, 1910.

Fig. 1.

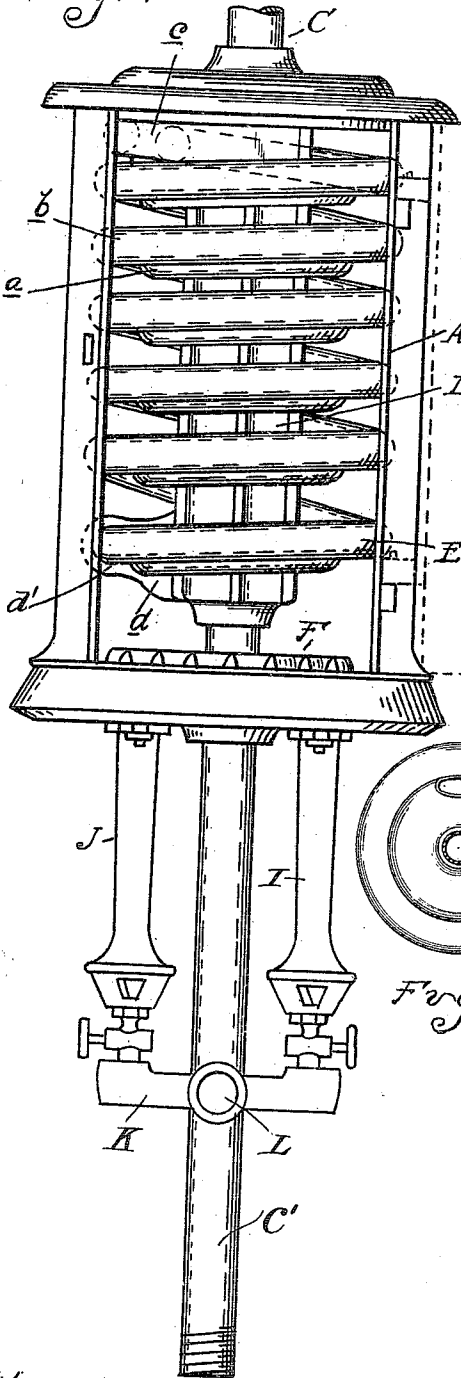


Fig. 2.

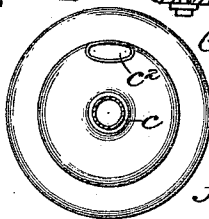
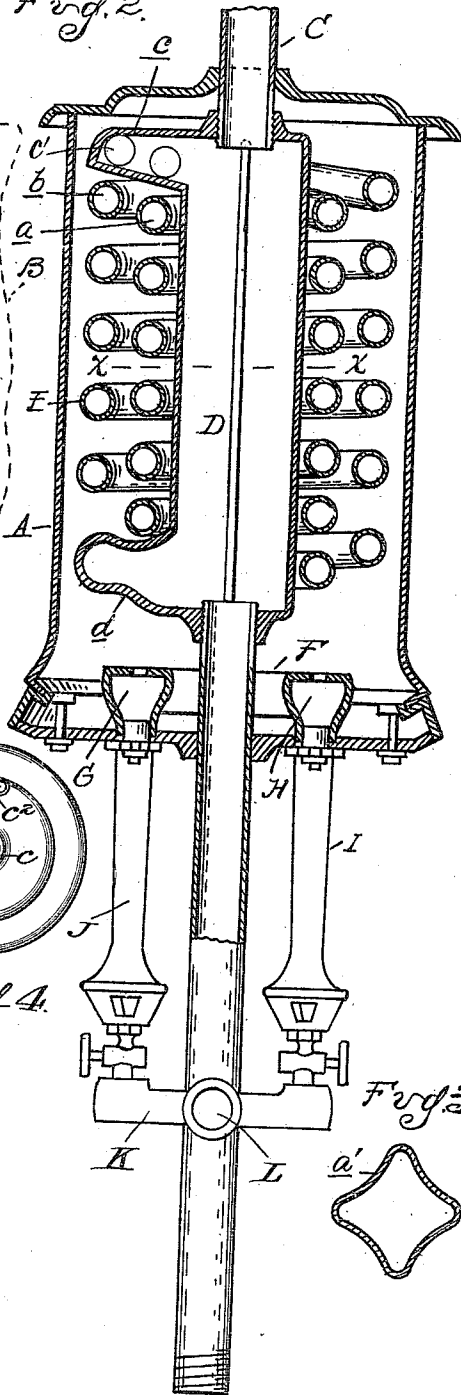
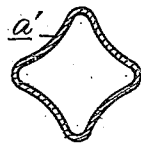


Fig. 4.

Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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HEATER.

979,527.

Specification of Letters Patent.

Patented Dec. 27, 1910.

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To all whom it may concern:

Be it known that I, JOHN S. McCARTHY, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates particularly to a water heater especially designed for use in a gravity circulating system, and consists in the construction of the heater, in the novel and peculiar combination of its parts, and in certain details of construction, as hereinafter set forth.

In the drawings,—Figure 1 is a view in front elevation of the heater, with the casing door removed to show the interior; Fig. 2 is a vertical central section; Fig. 3 is a cross section taken on lines *x-x* of Fig. 2; and Fig. 4 is a top plan view of the structures shown in Figs. 1 and 2.

In the drawings thus briefly described, I have shown the heater in its preferred form and as adapted to be connected up to the ordinary hot water boiler. In construction, it comprises a suitable casing A, preferably of cast iron, provided with a door B, allowing access to the interior of the structure to permit of cleansing.

C' designates the water supply conduit, D is a hollow deflecting member having one end connected to said supply conduit, and C is a conduit leading from the upper end of said deflector.

C² represents the usual pipe connection to which the pipe for carrying away the products of combustion is attached.

E represents coiled pipe encircling the deflector, as shown, and connecting at opposite ends therewith at its upper and lower portions, as indicated in Fig. 2. Preferably, two copper coils are employed, an inner and an outer, designated by the reference characters *a* and *b*, and these connect at their opposite ends with headers *c* and *d* by means of apertures *c'* and *d'* formed in one edge of said headers. The latter are preferably formed integral with the deflector D and are in direct communication with the interior thereof.

Arranged within the lower portion of the casing adjoining the deflector, and imme-

diately beneath the heating coils, is the burner F. This is preferably formed in two independent sections, G and H, to which gas if desired may be supplied through the pipes I and J, these branches being united by a cross connection K which receives its supply from any ordinary gas pipe connection, as L.

In the operation of the heater, the flame from the burner will play upon the coils and will be concentrated thereon by the deflector. At the same time, the deflector will become heated, and itself will serve to heat the water, so that a triple heating effect is obtained through the complementary coils and hollow baffle or deflecting member. Furthermore, the deflector being water-cooled is prevented from burning out, whereby the life of the heater is materially prolonged.

To facilitate the assembling of parts, the headers *c d* are made substantially thin and flat, and having their apertured edges facing in opposite directions, as indicated in Fig. 3, allowing the coils—which are not of a sufficiently large diameter to be slipped over the deflector—to be screwed thereon, the headers extending between adjoining convolutions of the pipes. I also form the body of the deflector of a cross section as shown in Fig. 4, each side *a'* being concaved. This provides a maximum radiating surface, with a minimum interior space or chamber, which I find gives the most satisfactory results.

What I claim as my invention is,—

1. In a water heater, the combination with a deflector forming a portion of the water conduit and provided with a longitudinally extending rib, of a coil of pipe encircling said deflector and having its opposite ends communicating with the latter, and a burner, said longitudinal rib being so constructed and arranged as to permit hot gases from the burner to impinge upon said deflector and the encircling coil.

2. In a water heater, the combination with a hollow deflector forming a portion of the water conduit, having a plurality of spaced longitudinally-extending ribs, of headers at the opposite ends of the deflector communicating with the interior thereof, a coil of pipe encircling said deflector and having its opposite ends communicating with the headers, and a burner, said longitudinal ribs be-

ing so constructed and arranged as to permit the hot gases from the burner to impinge upon said deflector and the encircling coil.

3. In a water heater, the combination with
5 a hollow deflector forming a portion of the water conduit, having a plurality of spaced longitudinally-extending ribs, of hollow headers at the opposite ends of said deflector communicating with the interior of and
10 projecting laterally from the deflector, a coil of pipe encircling the deflector and having its opposite ends connected to the headers, and a burner, said longitudinal ribs being
15 so constructed and arranged as to permit the hot gases from the burner to impinge upon said deflector and the encircling coil.

4. In a water heater, the combination with a hollow deflector forming a portion of the water conduit, having a plurality of spaced
20 longitudinally-extending ribs, the portion of the walls of the deflector between said ribs being inwardly concave, of headers at the opposite ends of the deflector communicating with the interior of and projecting
25 laterally from the same, a coil of pipe encircling the deflector having its opposite ends connected with the headers, and a burner, said longitudinal ribs being so arranged as
30 to impinge upon said deflector and the encircling coil.

5. In a water heater, the combination with a casing, of a hollow deflector within the

casing, hollow headers at the opposite ends of the deflector extending laterally there- 35 from, each of said headers being provided with a pipe-engaging bearing face, the bearing face of one header projecting in a direction opposite from that of the other header, a coil of pipe encircling the deflector and 40 having its opposite ends connected respectively to said bearing faces and a burner operatively associated with the deflector and the pipe coil.

6. In a water heater the combination with 45 a casing and a water conduit provided with a hollow deflector within the casing, said deflector having a plurality of spaced longitudinally extending ribs, hollow headers at opposite ends of said deflector extending 50 laterally therefrom, each being provided with a pipe engaging bearing face, the bearing face of one header projecting in a direction opposite from that of the other, a coil of pipe encircling the deflector and having 55 its opposite ends connected respectively to said bearing faces, and a burner operatively associated with the deflector and the pipe coil.

In testimony whereof I affix my signature 60 in presence of two witnesses.

JOHN S. McCARTHY.

Witnesses:

ANNA H. HEINRICH,
ROSS R. CATON.