

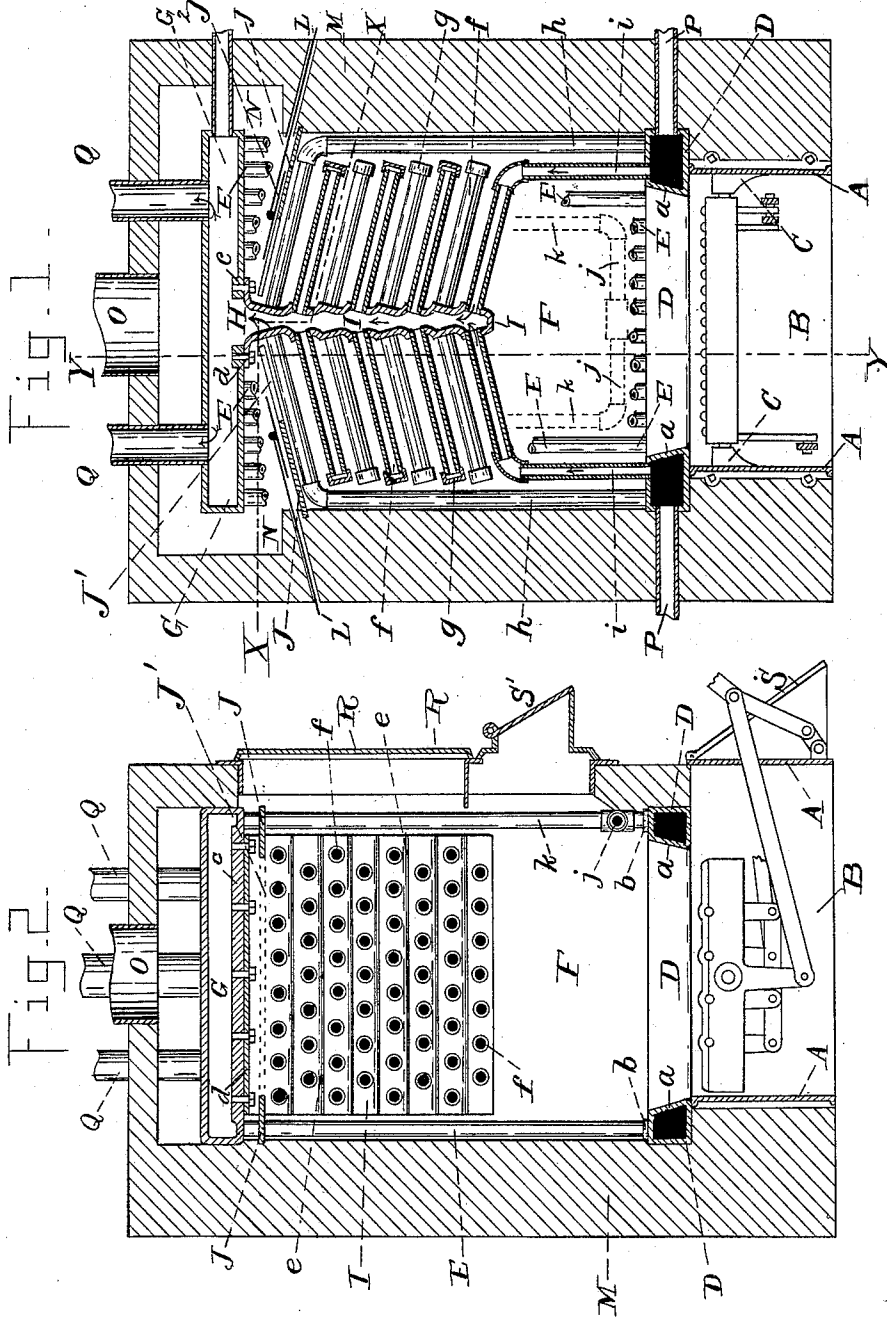
(No Model.)

2 Sheets—Sheet 1.

C. G. JEWETT.
WATER HEATER.

No. 405,481.

Patented June 18, 1889.



Witnesses:

J. Paul Mayer
P. M. Hubert

Inventor.

Charles G. Jewett.

By *James Whittencore*
Atty.

(No Model.)

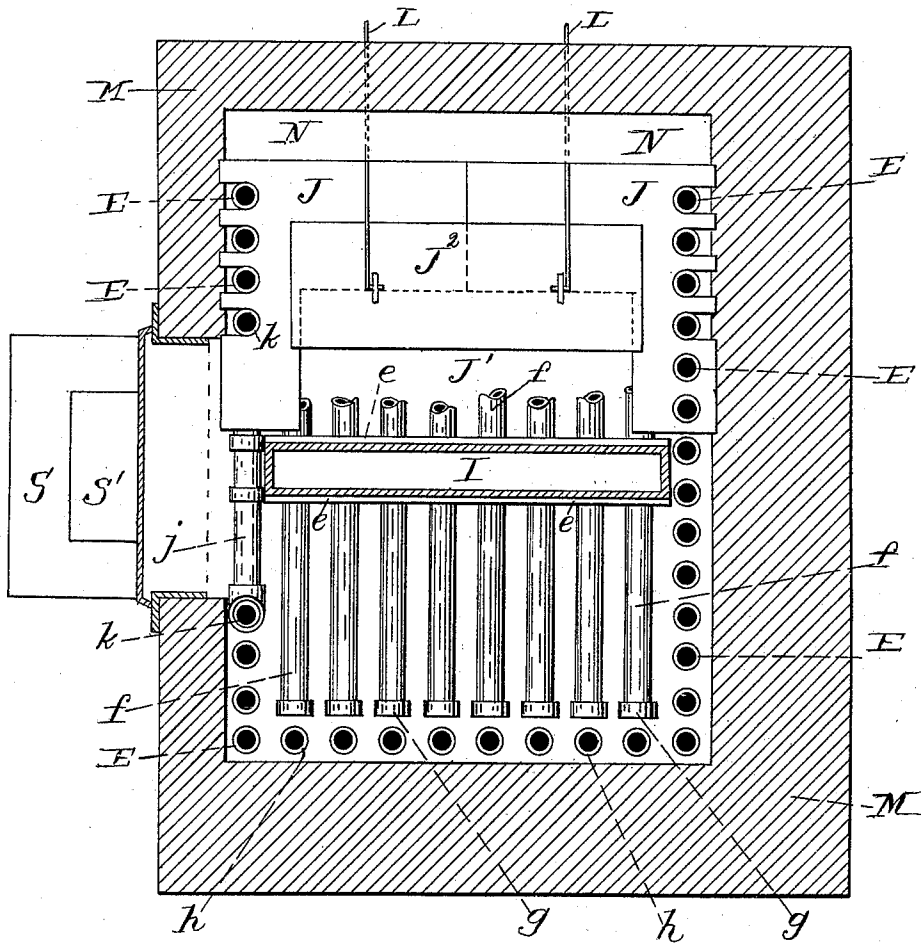
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Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES G. JEWETT, OF HOWELL, MICHIGAN.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 405,481, dated June 18, 1889.

Application filed February 25, 1889. Serial No. 301,132. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. JEWETT, a citizen of the United States, residing at Howell, in the county of Livingston and State of Michigan, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in hot-water heaters; and the invention relates to the peculiar arrangement and construction of the various parts, whereby a rapid circulation of the water is obtained
15 with small friction through the water-heater itself, and, further, that the heat in the combustion-chamber is utilized to a greater degree or with less loss than in previous constructions, all as more fully hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a vertical central section of a water-heater embodying my invention. Fig. 2 is a similar section on line Y Y in Fig. 1.
25 Fig. 3 is a plan view on line X X in Fig. 1.

A is the lower casing, preferably of cast-iron, surrounding the usual ash-pit B, and provided with suitable means—such as the bracket C—for supporting the grates of any
30 suitable construction.

D is a water-ring surrounding the combustion-chamber and supported upon the lower casing. The inner edge *a* of this ring is preferably slightly inclined to provide a suitable
35 feed for the fuel. The upper side of this water-ring is provided with suitable lugs *b*, provided with screw-threads, into which are secured vertical pipes E, which extend the entire length of the combustion-chamber F, and
40 at the top engage into the screw-threaded apertures in the lower side of the water-chamber G, which extends across the entire top of the combustion-chamber.

The middle of the lower side of the water-chamber G is provided with an aperture H, the sides of which are preferably suitably reinforced by the flanges *c*.

Secured on the under side of the water-chamber G is the water-leg I, which extends
50 downward into the combustion-chamber, di-

viding it centrally into two parts. I preferably secure this depending water-leg to the water-chamber G by providing its upper end with the flanges *d* and bolting it with suitable bolts into the flanges *c*, the open upper
55 end of the water-leg I coinciding with the aperture in the lower side of the water-chamber G.

The sides of the water-leg I are formed with the inclined steps *e*, provided with suitable
60 screw-threaded apertures to receive a series of heating-tubes *f*, at an angle between the horizontal and the perpendicular, as shown. The lower ends of these pipes are provided with a cap *g*, or inclosed in any other suitable
65 manner, and the upper and lower tiers of these pipes are connected by the pipes *h* and *i*, respectively, with the water-ring D.

At the front side of the furnace I make connections between the water-ring D and
70 the water-chamber G through the pipes *j* and *k*, so arranged as to permit of feeding the coal into the combustion-chamber by forming a yoke-shaped connection, as shown.

At the top of the combustion-chamber I
75 provide suitable metallic covers J on each side of the water-leg I, provided with suitable apertures J' for the passage of the products of combustion, and which may be provided with dampers J², which close or disclose the
80 opening, as may be desired, through the connections L.

Around the heater thus constructed I preferably build a suitable casing M, of brick or metal, as may be desired, in the upper end of
85 which I provide the passages N, which extend around the sides of the water-chamber, and unite at the top in a suitable exit O, having connection with the chimney. The water-ring D is provided with suitable return-
90 pipes P.

The parts being thus constructed and arranged, they are designed to operate as follows: A fire being built in the combustion-chamber upon the grates in the usual man-
95 ner, the products of combustion pass upward through the combustion-chamber on both sides of the water-leg I, and in contact with the pipes *f*, *h*, and *i*, and through the apertures J' in the covers J, around the water-
100

chamber G, and through the exit O. It will be seen that, the piping in the system being filled with water, a circulation will be started and the heated water will rise from the upper part of the water-chamber G through the pipes Q, and the cold water will be supplied through the pipes P in the water-ring. As soon as the water leaves the water-ring D it is divided, part going directly through the pipes *h* to the top of the water-leg, thence into the water-chamber G and upward, and part through the pipe *i* into the lower end of the water-leg. The water thus brought into the base of the water-leg has a general upward motion, but at the same time, being cooler than the water in the pipes *f*, it feeds into the bottom of these pipes, while the heated water flows out into the water-leg, as shown by the arrows. At the same time the heat impinges directly on the outer side of the water-leg I and on both the top and bottom of the water-chamber G. The inclination of the pipes *f* from the horizontal position downward assists very materially in making the circulation within such tubes, and at the same time prevents the constant burning out which occurs in perpendicular pipes or drop-tubes.

The construction of the water-leg I, depending from the water-chamber G, dividing the combustion-chamber into two parts, allows of more perfectly regulating the draft by opening one or both of the dampers at the top, as may be desired, and by the use of the inclined steps also permits of a more economical construction of such a device in connection with the inclined tubes, and the connection with the water-ring D and the lower and upper ends of the water-leg I materially aids the circulation of the water through the heater in a large volume without any loss in the beneficial results of the heat. The sides of the water-ring D form the lower parts of the sides of the combustion-chamber and support the coal or other fuel in a proper manner, thereby obtaining the benefit of the heat from direct radiation from such contact.

A suitable casing R of metal is provided for the front of the heater, which is also provided with the usual draft and feed doors S and S'.

My construction gives a most rapid circulation by dividing the water into the various channels shown, and at the same time heats it to a higher temperature than other constructions having a much slower circulation through the heater. The pipes *h*, carrying the water into the water-leg at the top, add to the volume of rising water at a point which largely increases the current, which is divided and passes across the chamber G to the outgoing pipes.

The upright pipes E, connecting to the outer edges of the water-chamber G from the water-ring D, make a circulation in all parts of the chamber G, so that there are no counter-currents nor stagnant points in the circulation produced.

What I claim as my invention is—

1. In a water-heater, the combination of a lower water-ring, an upper water-chamber provided with a depending water-leg dividing the combustion-chamber transversely, and connections between the water-ring and the top and bottom of said water-leg, substantially as described.

2. In a water-heater, the combination of a lower water-ring, an upper chamber provided with a depending central water-leg dividing between the top and bottom of said water-leg and the water-ring, direct connections between the water-ring and the water-chamber at the edge, and the heating-tubes *f*, attached to said water-leg, substantially as described.

3. In a water-heater, the combination of a lower water-ring, an upper water-chamber provided with a depending water-leg having inclined steps, inclined heating-tubes engaged in suitable screw-threaded apertures therein, and the pipes *h*, *i*, and E, connecting the water-ring with the water-leg and water-chamber, substantially as and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 11th day of January, 1889.

CHARLES G. JEWETT.

Witnesses:

JAMES WHITEMORE,
J. PAUL MAYER.