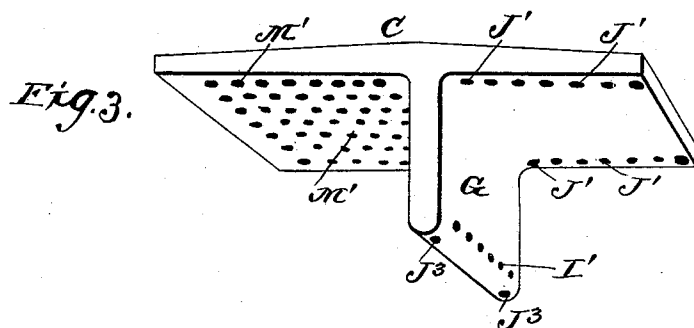
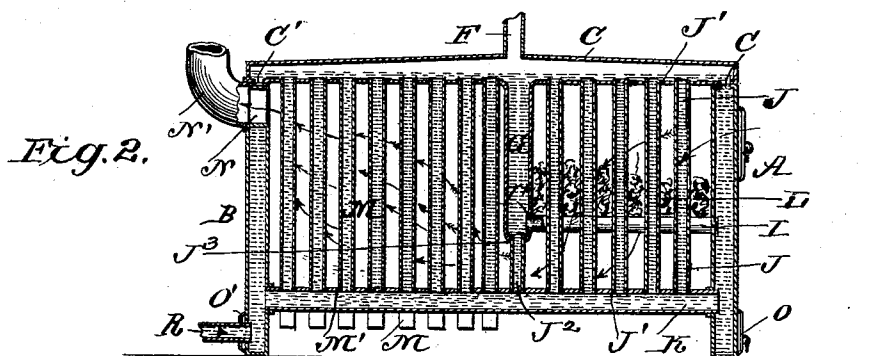
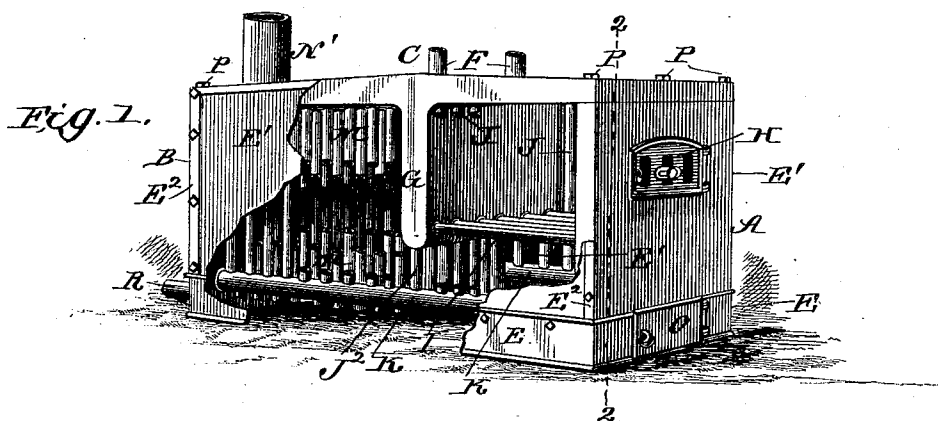


(No Model.)

M. E. HERBERT.
HOT WATER HEATER.

No. 487.620.

Patented Dec. 6, 1892.



WITNESSES:

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UNITED STATES PATENT OFFICE.

MICHEAL E. HERBERT, OF ST. JOSEPH, MISSOURI.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 487,620, dated December 6, 1892.

Application filed March 4, 1892. Serial No. 423,793. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL E. HERBERT, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

The objects of my invention are, first, to construct a hot-water heater which shall be economical in fuel and a rapid heater; second, to so arrange the different parts that each part shall be light of weight, easy to handle, and quickly connected together; third, to so construct the heater that masonry may be dispensed with, thereby avoiding time and expense in putting the heater in place where it is to be used, and also avoiding the necessity of occupying a large amount of space, which is the case where masonry is employed; fourth, to construct the heater in such a manner that the smoke and gases arising from the combustion of soft coal may be effectually burned, thereby abating the smoke nuisance; fifth, to so construct the heater that soot, &c., may be readily cleaned from the outside surface of the tubes and shell and that sediment and other deposits may be readily removed from the interior of said heater.

To these ends my invention consists in the novel construction and combination of parts, such as will be hereinafter fully described in the specification, and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved heater as it appears when ready for use, parts being broken away to more clearly illustrate the interior construction. Fig. 2 is a vertical longitudinal section of the same on the line 2 2, Fig. 1; and Fig. 3 is an inverted perspective view of the top section and its pendent water-leg.

The body of the heater is formed of a front water-section A, rear section B, the top section C, and the jacket which is formed of the two side plates E E' and the two side plates E' E', as shown.

It will be noticed by reference to Fig. 1 that the top section C is formed with a pendent water-leg G, separating the upper part of the body into two compartments, to the front one of which fuel is fed through the door H, which

rests upon a grate portion formed by the water-tubes I, which connect the lower end of the water-leg G with the front section A, and thereby allows a free circulation of water through the grate-tubes I.

The sides of the fire-box are formed by a series of tubes J, which connect at their upper ends with the top C and at their lower ends with the header-tubes K, which are joined with the lower ends of the front and rear sections, as shown. It will be noticed by reference to Fig. 2 that the front section A, the water-leg G, and tubes I, J, and K are filled with water, thus inclosing the entire fire-box in a water-space, thereby affording an enormous amount of surface for the absorption of heat generated in said fire-box.

The interior of the rear compartment of my improved heater is filled with a series of drop-tubes M, screwed into the under side of the top section C.

In operation the air passes down through the door H, through the fuel, and between the grate-tubes, under the water-leg G, between the tubes M, through an opening N, formed in the rear section B, and up into the smoke-stack N' in the usual manner.

It will be seen in Fig. 1 that, in addition to the absorbing-surface already described, the drop-tubes M afford an enormous amount of surface for the absorption of heat.

The smoke and gases are consumed as a result of the downward draft through fuel L. As the fresh fuel is coked at the upper surface of the fuel L and as the smoke and gases pass down through the clear fire lying next and above the grate I they are effectually burned and consumed, by means of which the smoke nuisance is effectually abated.

Ashes falling from the grates L may be readily removed through the door O, and the dust particles dropping beneath drop-tubes in rear compartment may be removed through the door O'.

When used as a hot-water circulator, tube R forms a return and the tubes F the flow pipes. In circulating, the water in front section A and rear section B passes upward through the openings C'. (Seen in Figs. 2 and 3.) The jackets formed of the plates E and E', placed at each side of the body, are screwed in place by the angle-straps E² in the

usual manner, the bolts P P securing the top section C to the front and rear sections A and B, as shown.

A clearer understanding of the arrangement of the tubes J and M may be had by reference to Fig. 3, from which it will be seen that on the under side of the top section C holes J' J' are arranged in two straight rows along the sides of the said section for the reception of the tubes J, and holes M', occupying nearly all of the rear portion of the said section, are provided, with which the drop-tubes M connect. Holes J³ J³ at the bottom of the water-leg G are provided for the reception of the pipes J², which form water connections between the said water-leg and the headers K, the holes I' being for the reception of the tubes I.

It will be noticed by reference to Figs. 1 and 2 that the drop-tubes M project down far below that part of the air-passage through which the intense heat passes, thereby avoiding burning of the lower ends of the said tubes M.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, in a hot-water heater essentially as described, with the front and end portions formed with the feed and exit openings, as shown, and the sides or casing, of a hollow top section having a depending water-leg, whereby to divide the upper part of the fire-chamber into two compartments, substantially as and for the purpose described.

2. In a water-heater substantially as described, the combination, with the end sections A and B, of the top compartment C, communicating at its ends with the end sections and formed with a depending water-leg G, substantially as and for the purpose described.

3. In a water-heater substantially as described, the combination of the front and rear sections A B, the feed and exit openings H and N, arranged as shown, and the top sec-

tion C, communicating with the end sections and formed with a depending water-leg G, of the tubular grates I, connecting the water-leg and front section, substantially as and for the purpose described.

4. A water-heater comprising the end water-sections A and B, the casing-plates E E', the top chamber C, having a depending water-leg G, the tubular heaters K, connecting the front and rear sections A and B, and the tubes J, connecting the headers and the top section C, substantially as and for the purpose described.

5. The combination, in a water-heater essentially as described, of the front and end sections A and B, formed with the feed and exit openings, as shown, the top section C, having a depending water-leg G, whereby to divide the upper part of the fire-chamber into two compartments and having a series of drop-tubes extended down into the rear compartment, substantially as and for the purpose described.

6. The combination, with the front and rear sections A and B, the top section C, communicating therewith, having a depending leg G, the grates I, the headers K, connecting the front and rear sections, the pipes J, connecting the headers and the top section C, and the pipes J², connecting the headers and the water-leg, all arranged substantially as shown and described.

7. The combination, with the front and rear sections A and B, the top section C, communicating with the sections A and B, having a depending water-leg, the grate-tubes I, side tubes J, and headers K, of the drop-tubes M, projected down from the upper chamber, the lower ends thereof extending to a point below the intense heat-current of the fire, all arranged substantially as and for the purpose described.

MICHEAL E. HERBERT.

Witnesses:

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