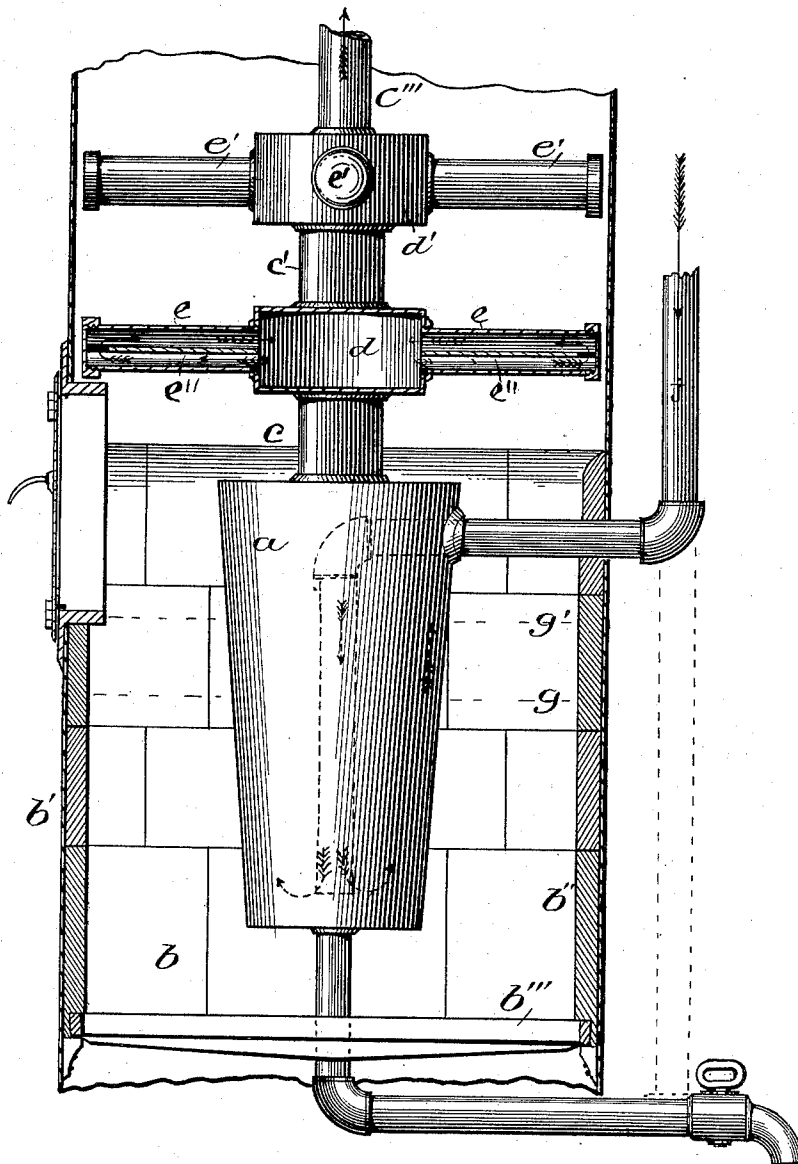


(No Model.)

T. TREE.  
HOT WATER HEATER.

No. 476,218.

Patented May 31, 1892.



Witnesses:  
F. C. Barr.  
Fred L. Putnam.

Inventor:  
Thomas Tree.

# UNITED STATES PATENT OFFICE.

THOMAS TREE, OF ITHACA, NEW YORK.

## HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 476,218, dated May 31, 1892.

Application filed January 14, 1892. Serial No. 418,125. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS TREE, a citizen of the United States, residing at Ithaca, Tompkins county, New York, have invented an Improved Water-Heater for the Circulation of Hot Water for Heating Purposes, of which the following is a specification, reference being had to the accompanying drawing.

My invention consists of a series of water-chambers attached vertically in the center of the fire-pot and in the fire-space of a stove, furnace, or other fuel-burner; and the nature of my invention will be apparent as I describe it.

The figure is a partially sectional elevation illustrative of a cylindrical stove with my invention in it large enough to indicate its several parts.

In the figure, *a* is the base or lower chamber of my heater, in shape a hollow inverted truncated cone within the stove or furnace *b*, and *c* is a piece of pipe that connects the said cone with the chamber *d*, out of which project the pipes *e*, as many in number as is desirable—four, six, eight, or more—and *d'* indicates a third chamber connected by the tube *c'* to the chamber *d*, with pipes *e'*. I use as many of these as the space in the building requires, in a series one above another. Each of the pipes has on its inside a partition *e''*, which is horizontal. In the said horizontal pipes and near their outer ends are apertures *e'''*, through which the water passes to the space above the partitions, as indicated by the arrows in the right-hand pipe *e*. The returning water from the rooms heated is by the pipe *j*, which pipe goes through the side of the base-chamber *a* near its top and then bends downward and reaches to near the bottom of this base *a*, where it terminates, releasing the water at the bottom of the base *a*, whence it flows upward, as the arrows indicate, and is by the heat propelled upward through the upper series of chambers above described to and out of the pipe *c'''*, and thence to the connected radiators of the circulation in the rooms of the building.

It is important to notice the space for ignited coal between the grate-bars *d'''* and the

bottom of the base-chamber *a*, for thus the ignited coal is in contact with the bottom of the base-chamber as well as with the sides of it, and by its truncated and inverted cone shape the ashes fall away from it and the coal and flame act more powerfully on it. It is also apparent that the stove or furnace is designed to be used by its direct air-heating for a portion of a building and the hot-water circulation for other and more distant portions of the building. The coal in the fire-pot is filled to either of the lines *g g'* or to any distance below the horizontal part of the pipe *j*.

The top of the stove indicated in the figure is not completed, since it may be made either plain or with hot-air flues. My device may be fitted to very many stoves and furnaces in common use. The chambers *d d'* of the upper series, with their pipes, are so set that the pipes *e e'* break joints or occupy the intermediate spaces one over the other, that they may the better have the direct action of the current of the fuel combustion. All else is believed to be apparent.

Disclaiming all else, what I claim in the above-described heater for hot-water circulation for heating purposes is—

1. In a water-heater inserted into a fuel-burner or furnace, the inverted truncated cone-shaped chamber *a*, located in proximity to the grate and adapted to be embedded in the fuel, in combination with the enlarged chambers *d d'* and their intermediate connections *c c'*, of less diameter, and radiating stellated chambers *e e'*, and the exit-tube *c'''*, constructed and arranged as set forth.

2. The return-pipe *j*, entering the stove or furnace cell and penetrating the upper part of the chamber *a* and extending nearly to the base of the same, in combination with the superimposed chambers, constructed and arranged as shown.

3. The water-holding chambers *d d'*, having radiating arms *e*, provided with the diaphragms *e''*, terminating at the point of attachment of the arms *e* to the chambers *d d'*, in combination with the intermediate connections *c c'*, and the chamber *a*, having the

entrance-pipe *j*, all arranged substantially as set forth.

4. The furnace, stove, or fuel-burner *b*, provided with the water-heating chambers *a* and  
5 *d d'*, the fire-space below the bottom of the lower chamber *a*, entrance-pipe *j*, its extension to the inside base or bottom of the cham-

ber *a*, pipes *c c'*, and exit-pipe *c'''*, combined and arranged substantially as set forth.

THOMAS TREE.

Witnesses:

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