

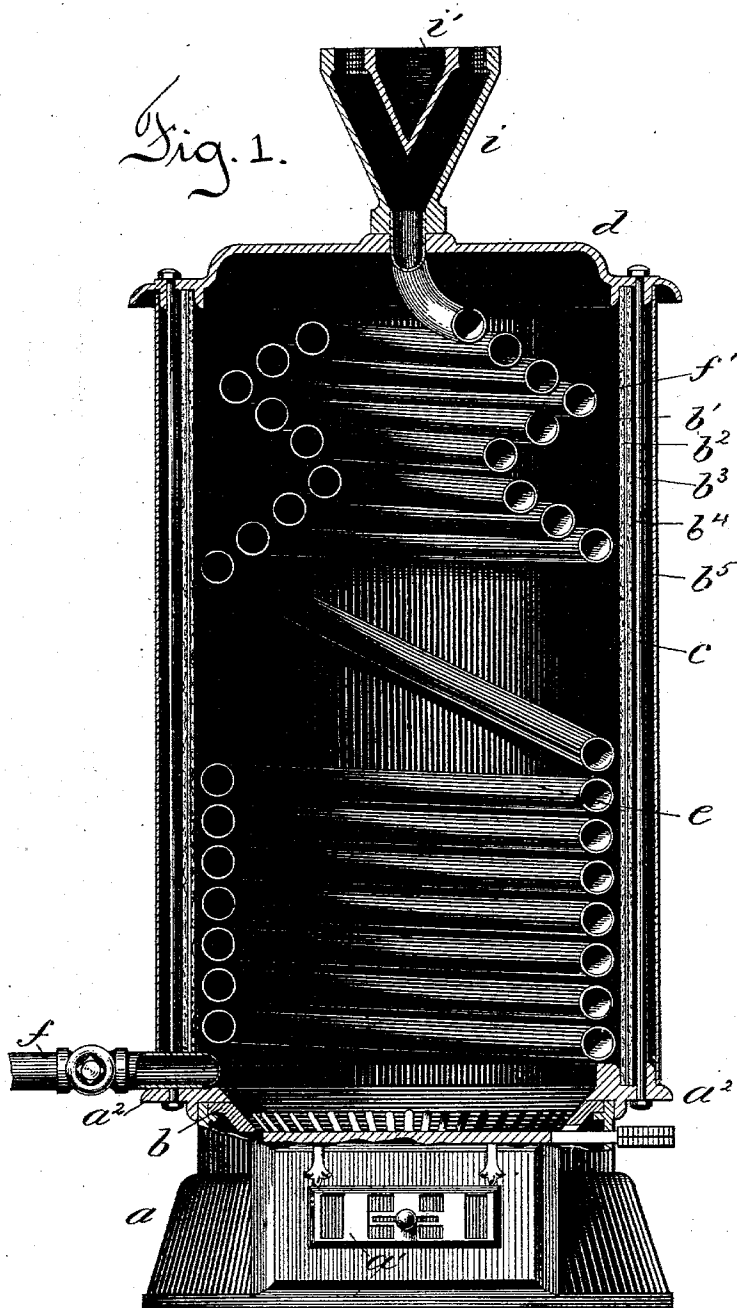
(No Model.)

2 Sheets—Sheet 1.

W. L. SHEPARD & E. W. WHITLOCK.
HOT WATER HEATER.

No. 562,857.

Patented June 30, 1896.



Witnesses
H. A. Liddings
E. Buckland.

Inventors
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attorney.

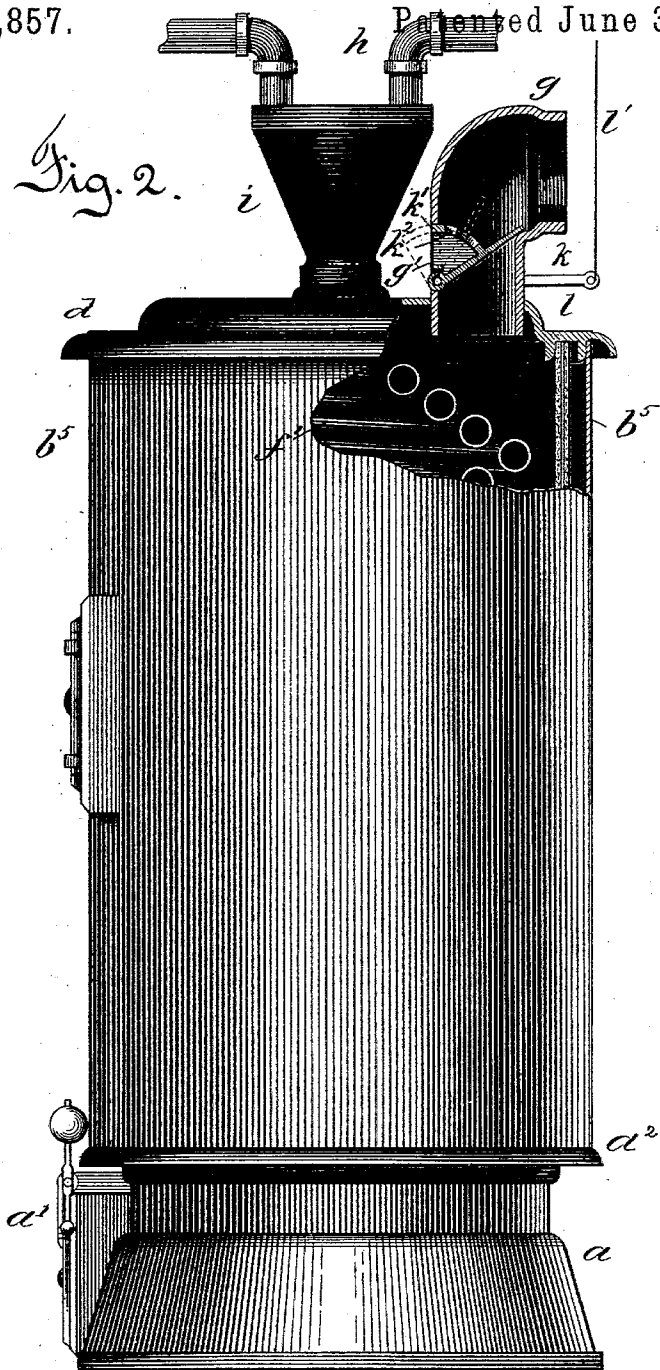
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UNITED STATES PATENT OFFICE.

WILBUR L. SHEPARD AND ERASTUS W. WHITLOCK, OF ELMWOOD,
CONNECTICUT.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 562,857, dated June 30, 1896.

Application filed March 30, 1892. Serial No. 427,081. (No model.)

To all whom it may concern:

Be it known that we, WILBUR L. SHEPARD and ERASTUS W. WHITLOCK, of Elmwood, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of our invention is to provide an apparatus for heating buildings by the circulation of a current of hot water from a central heater through connecting pipes and coils or radiators of a heating system, and to provide a heater in which water can be economically and rapidly heated and effectively circulated.

To this end our invention consists in the details of the several parts making up the heater as a whole and in the combination of such parts as more particularly hereinafter described, and pointed out in the claim.

Referring to the drawings, Figure 1 is a detail view, in vertical central section, through our improved heater, showing the construction. Fig. 2 is a view in elevation of the heater, with parts broken away to show construction.

In the accompanying drawings the letter *a* denotes the base of the heater, that may be of any convenient construction, but usually of metal cast to shape, and having an ash-pit provided with a door *a'*, having the usual damper. At the top of the base is supported a grate *b*, and above this is a flange *a''*, that supports the upright walls of the heater, that are preferably cylindrical in form. This inclosing wall is made up, preferably, of an inner layer *b'* of asbestos, next to which is a layer *b''* of metal; next to this a layer *b'''*, made up of wool and asbestos. Outside of this is a space *b''''* and the jacket *b''''''*. Surrounding the whole is a metal drum. A number of bolts *c* extend lengthwise from the flange *a''* to the top piece or cover *d* and serve to hold by means of the usual nuts and threaded ends the several parts of the heater-body together. Within the walls is arranged a fire-box *e*, that is made up of close coils of the water-pipe *f*, that enters the chamber by the bottom and is arranged in a series of close coils to form

the fire-box, and then within the combustion-chamber is another series of close coils, preferably staggered, as shown in the drawings, to enable the water to be still further heated in its passage up and through the heater. This heater-pipe is composed of a single piece of pipe bent and coiled to the proper shape to form the fire-box *e* and the heating-drum *f'*, and this pipe is preferably made of seamless tubing.

The "heating-drum," as that part of the coil that is arranged in a somewhat close series of bends in the upper part of the combustion-chamber has been termed, may be made in any convenient form, staggered as shown, in beehive shape, or in successive layers with greater or less intervals and so arranged as to interrupt the heated products of combustion as they pass from the fire-box up and around the coils and out through the uptake *g*. (Shown in Fig. 2 of the drawings.)

From the heater pipes *h* in any convenient number branch to the radiators or coils arranged in one or more rooms in the building and a return-pipe extends from the radiators of the system back to the pipe *f*, the usual valves and attachments common in a hot-water system being used. A peculiar feature of our invention resides in the construction and arrangement of the equalizer *i*, into which the water flows from the heater-coil within the heater and from which it is distributed in an even manner and in an equal degree to the several branches that may be connected with the upper part of the equalizer. This device consists of a body part having, preferably, conical or equivalent form, smaller at the bottom than at the part from which the branches extend and with a re-entrant part *i'* extending within the body of the equalizer and terminating, preferably, opposite what may be termed the "inlet-opening." It has been found by practice that by the use of this equalizer the difficulty experienced in old devices of this class of providing for an equal and uniform flow of the water through different branches is obviated and an equal and uniform flow is established.

In the uptake or smoke-pipe *g* there is arranged a damper *k*, pivoted at one side of an opening *g'*, and comprising a damper proper

that extends completely across the flue and has a wing k' curved on the arc of a circle struck on the pivot from which the damper swings and with side walls so as to extend completely across the opening through the wall of the uptake or flue. Through the wing or the side parts are formed ports k^2 , that provide for the inflow of air from the outside of the heater through the flue to the chimney when the damper is closed or but partly opened. When the damper is swung to the position denoted by the dotted outline, a draft will be established through the heater and the greater part of the air-ports k^2 closed.

15 A lever l is secured to the damper-spindle and is preferably connected as by means of a cord or chain l' with an upper room, so that the position of the damper may be controlled from an upper apartment by a proper manipulation of this cord.

The usual doorway through the wall of the heater is provided for the introduction of fuel into the fire-box.

An important advantage in securing a positive circulation of the water in the right direction resides in the arrangement of the intermediate coil that extends, in a sharper rise than is used in the coil of the fire-box, from the top of the latter to the bottom of the coils forming the heating-drum. A considerable space is thus left between the top of the fire-box and the bottom of the lower coil of the

heating-drum, and this provides sufficient room for supplying fuel to the fire. This intermediate branch or pipe having the sharp rise, as is shown in Fig. 2 of the drawings, is the pipe which is from its location first heated, and, owing to the fact that the tendency of the heated column in that pipe is to rise, a circulation is started in the proper direction and is thoroughly established as the contents of successive pipes become heated. By the use of this intermediate branch any back-flow is prevented.

We claim as our invention—

In a hot-water heater in combination with the base and top, side walls comprising an inner layer of asbestos an intermediate layer of metal a layer of asbestos and wool, an air-space and an outer jacket, a single length of water-pipe extending through the heater-chamber within the drum with a series of closed coils forming the walls of the fire-box and a series of irregular coils in the combustion-chamber above the fire-box, and an equalizer interposed between the heater-coil and the distributing-pipes of the system, all substantially as described.

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