

J. H. BAKER & G. F. SHEVLIN.

STEAM HEATER.

No. 355,807.

Patented Jan. 11, 1887.

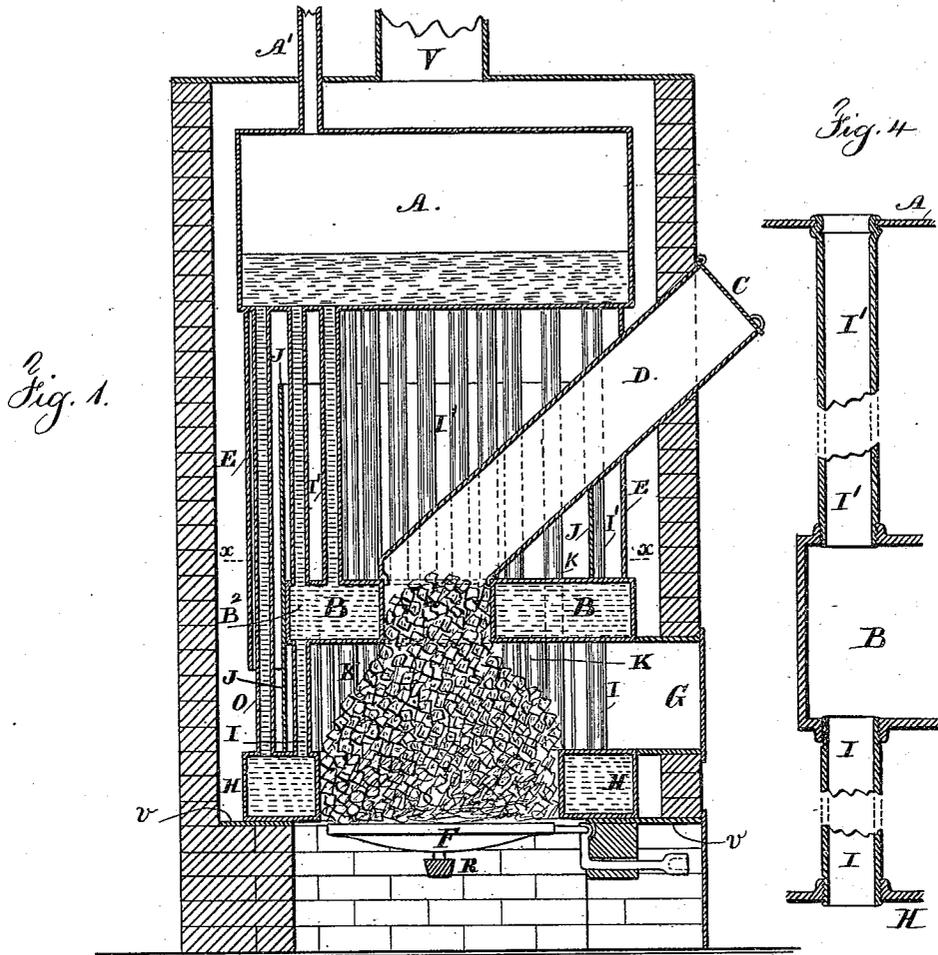


Fig. 1.

Fig. 4.

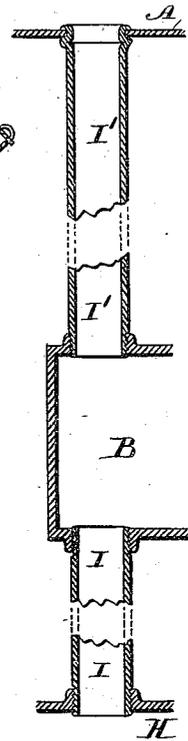
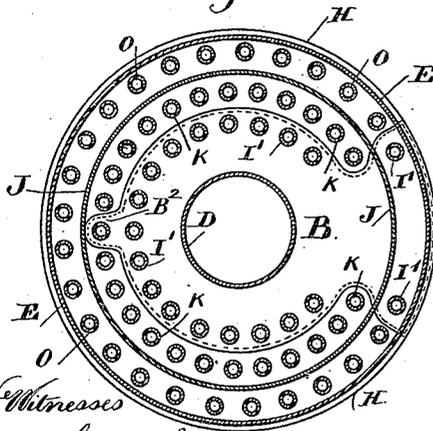
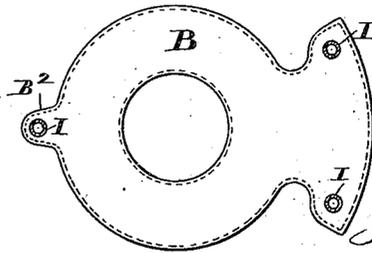


Fig. 2.



Witnesses
 Chas. A. Smith
 J. Hail

Fig. 3.



Inventors
 James H. Baker.
 George F. Shevlin
 per Lemuel W. Serrell atty

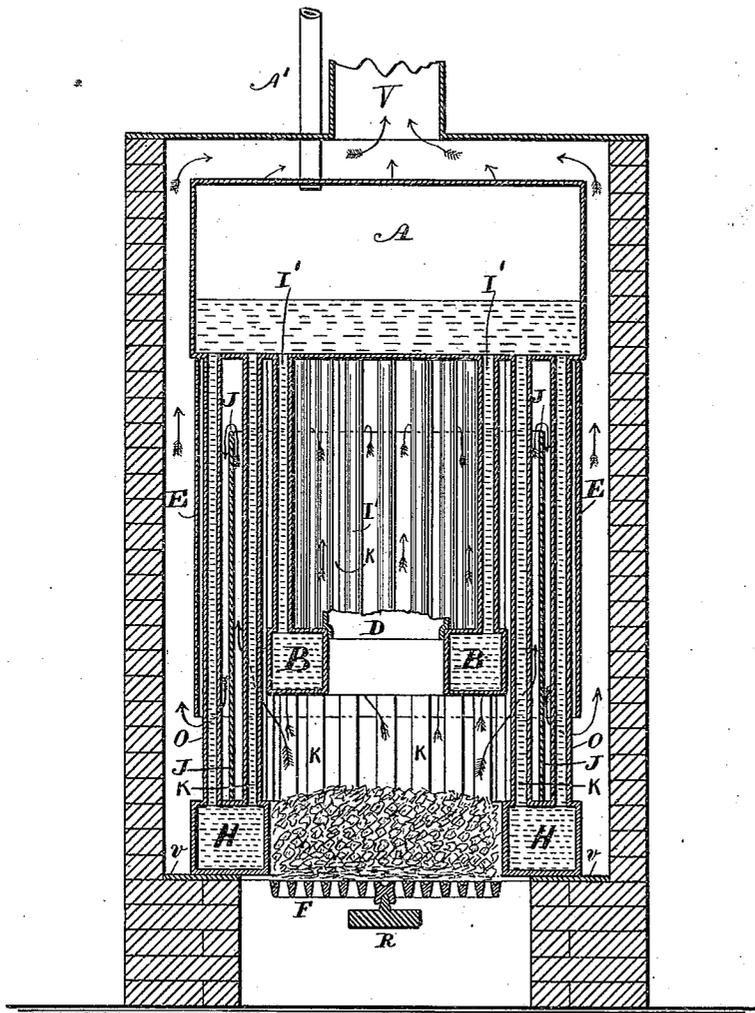
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Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

JAMES H. BAKER AND GEORGE F. SHEVLIN, OF SARATOGA SPRINGS, N. Y.

STEAM-HEATER.

SPECIFICATION forming part of Letters Patent No. 355,807, dated January 11, 1887.

Application filed September 3, 1886. Serial No. 212,607. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. BAKER and GEORGE F. SHEVLIN, of Saratoga Springs, in the county of Saratoga and State of New York, have invented an Improvement in Steam-Heaters, of which the following is a specification.

Steam-heaters have been made with concentric ranges of tubes extending from a bosh around the fire up to a dome or steam-drum, and the fuel has been supplied into a hopper or magazine passing in laterally and going through an annular water-chamber.

Our present improvements relate to a boiler of the general class before mentioned, and they are made for lessening the injurious effects of the products of combustion upon the pipes and flue-sheet and to increase the efficiency of the heat.

In the boilers heretofore made the products of combustion rose above the fire and passed off directly below the steam-drum and between the tubes, thereby allowing a great portion of the products of combustion to escape and applying too great head at this part of the steam-heater.

We surround the tubes with a hanging cylinder or skirt extending downwardly from the drum, so that the heated products of combustion are detained within the hanging cylinder and give off their heat with greater uniformity to the tubes and the water contained in them, and we place between the tubes a standing cylinder to compel the products of combustion to ascend sufficiently high before passing down below the hanging skirt, and we make use of an annular central vessel for water, connected and supported by pipes to the other parts of the heater, to aid in equalizing the action of the heat on the flues.

In the drawings, Figure 1 is a vertical section of the steam-heater, and Fig. 2 is a horizontal plan of the same at the line *x x*. Fig. 3 is an inverted plan of the central vessel; and Fig. 4 is a partial section, in larger size, showing the manner of securing the tubes. Fig. 5 is a vertical section of the steam-heater at about right angles to Fig. 1.

The base-ring H is a hollow vessel, and it is supported by the brick-work of the ash-pit, preferably with an intervening plate, *v*, and the grate F is supported below the annular

base H by a cross-bar, R, which has a bearing at its ends upon legs upon the plate or ring *v*. In the top of the base-ring H are two ranges of holes, into which are screwed the lower ends of the vertical tubes O and K, and the upper ends of these tubes pass into holes in the bottom or tube sheet of the dome or drum A, and we find it advantageous to expand the upper ends of these tubes when securing them into the bottom of the drum.

The annular central vessel, B, is hollow, and there are pipes I extending downwardly from it to the base-ring H, and preferably made with right- and left-handed screw-threads at the ends, by which they are connected to the respective parts, and it is preferable to insert this vessel B above the fire-door G, and to have a lateral extension at this side of the vessel for the pipes I, which stand at the sides of the doorway. The pipes I' extend from the top of the vessel B to the under side of the drum A, and it is sometimes preferable to make a lateral projection at the opposite side of the vessel B, as seen at B², so that one or more pipes at that side of the furnace may be made to aid in supporting the vessel B.

The dome or drum A is of usual construction, and is applied to the tubes after they are otherwise secured in place, and the steam is taken away by the pipe A' to the radiators or other devices, and the inclosing brick-work and flue V are of any desired character.

The pendent skirt E extends downwardly from the dome A to near the fire-chamber, and the standing-cylinder J is introduced between the rows O and K of tubes.

The magazine or coal-holder D passes diagonally through the brick-work casing, and is provided with a cover, C, and its lower end coincides with the top of the vessel B at the central opening, so that the coal slides down this magazine and passes to the fire upon the grate.

The products of combustion pass up around the vessel B and between the tubes K and I', and go over the top of the standing-cylinder J and down around the tubes O, and escape below the lower end of the pendent skirt E and rise around the parts and pass away by the flue V, thus compelling the heat to pass in contact with the entire surface of the boiler, and

detaining the products of combustion until the heat is given off to the tubes and the water contained in them.

In cases where circular ranges of tubes have been used with a pendent skirt and standing cylinder the grate has been above the lower ends of the tubes, and the base has not been a ring; hence the space around the lower ends of the inner range of tubes becomes obstructed with dust and ashes. In our improvement these fall back into the fire.

We claim as our invention—

1. The combination, with the grate of the hollow base-ring H, surrounding the fire-space above the grate, the dome or drum, and the annular ranges O K, of vertical tubes connecting the drum and the ring H, the skirt F, hanging from the lower edge of the drum and outside the ranges of tubes, and the standing-cylinder J, between the ranges of tubes and resting upon the base-ring, substantially as set forth.

2. The drum A and the annular central vessel, B, in combination with the base-ring H, the pipes I, by which the vessel B and base-ring H are connected, the pipes O K, that connect

the base-ring and drum, and the pipes that connect the vessel B and the drum A, the hanging skirt E, and the standing-cylinder between the ranges of tubes O and K, substantially as set forth.

3. The combination, with the base-ring, the drum, and the pipes connecting them, of the water-vessel B, having a central opening and a lateral extension toward the fire-door, and the pipes for connecting the central vessel with the ring and drum, substantially as set forth.

4. The combination, with the drum A, the central section, B, and the hollow base-ring H, of the tubes I' and I, the tubes I being attached to the center section and base, respectively, by right-and-left-hand threads, and the tubes I' screwed into threaded holes in the center section, B, and expanded at the tube-sheet of the drum A, substantially as specified.

Signed by us this 16th day of August, 1886.

JAMES H. BAKER.
GEO. F. SHEVLIN.

Witnesses:

A. W. SHEPHERD,
J. W. CRANE.