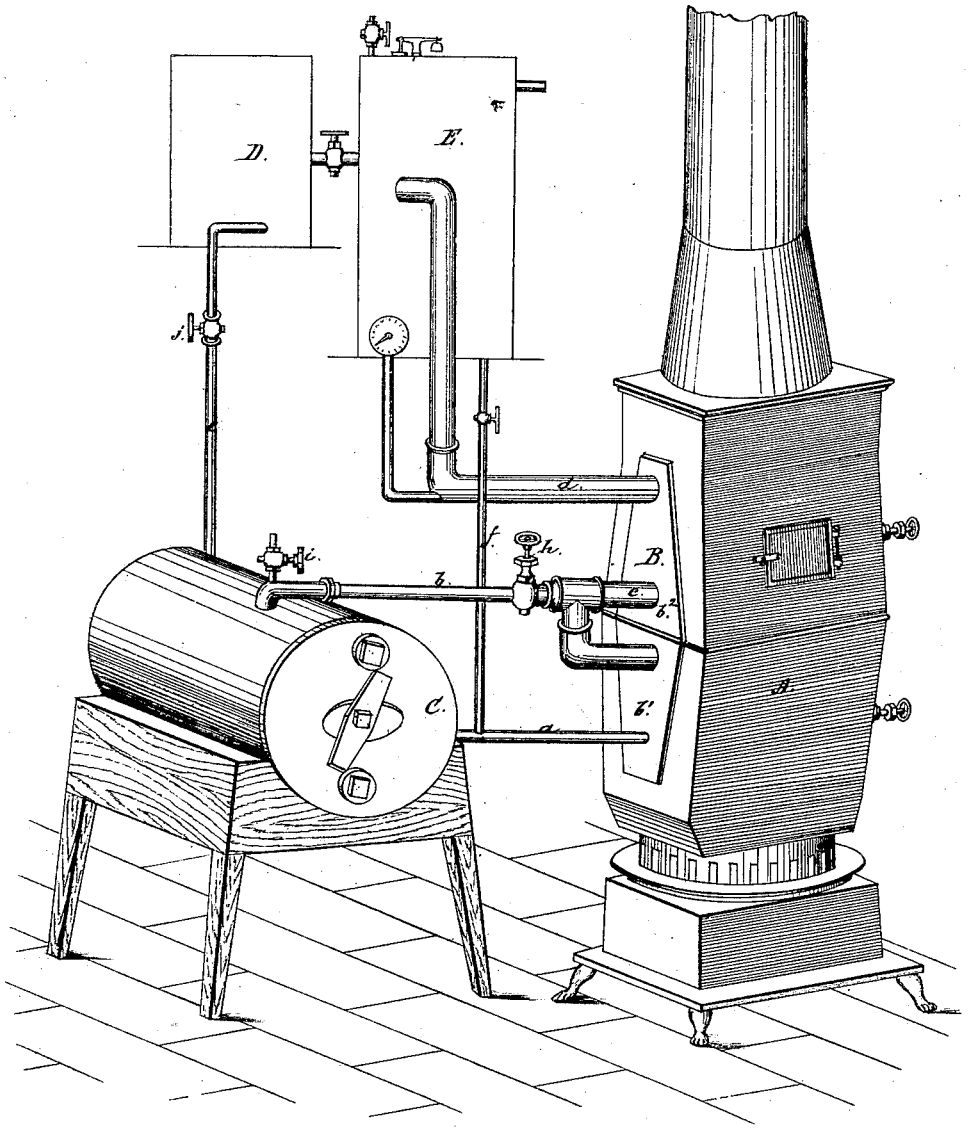
Sheet 1. 2 Sheets.

Rigby & Palmer,

Steam Heater,

No. 108,394, Patented Oct. 18, 1870.



Witnesses:

H. G. Sweetser

F. H. Pierson

Inventor

Rigby & Palmer by

H. W. Bradley atty.

Sheet 2-2 Sheets.

Rigby & Palmer,

Steam Heater,

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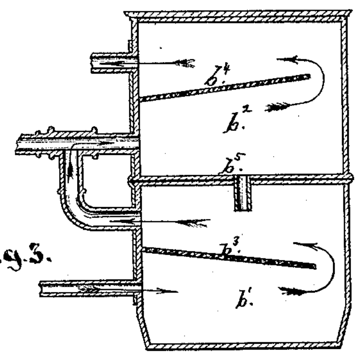


Fig. 3.

Fig. 2.

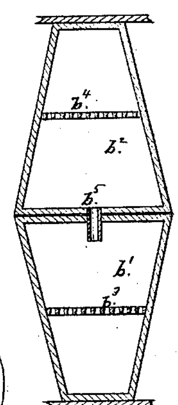
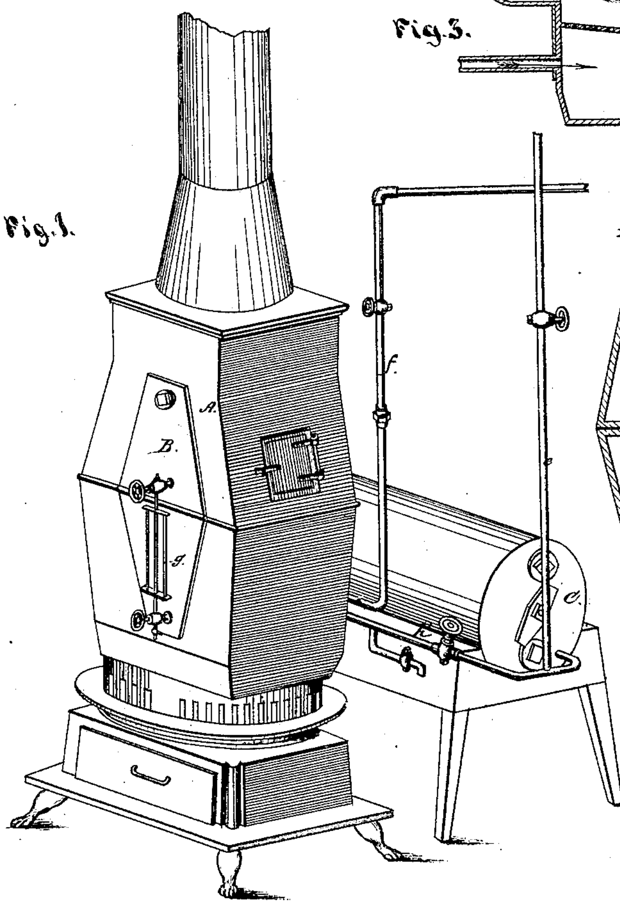


Fig. 1.



Witnesses:

H. J. Metz
F. H. Pierson

Inventor

Rigby & Palmer by
S. W. Beadle atty.

United States Patent Office.

JAMES RIGBY AND PHILIP A. PALMER, OF MARIETTA, OHIO.

Letters Patent No. 108,394, dated October 18, 1870.

IMPROVEMENT IN STEAM GENERATORS AND HOT-WATER APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that we, JAMES RIGBY and PHILIP A. PALMER, both of Marietta, in the county of Washington and State of Ohio, have invented a new and improved Steam-generating and Hot-water Apparatus; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention consists in the peculiar construction of the boiler and furnace of an improved heating apparatus, and also in the arrangement of the tanks and connecting-pipes.

The details of construction and manner of operation will be fully described hereinafter.

In the drawing—

In sheet 1 is shown a perspective view of our improved apparatus complete.

In sheet 2, Figure 1, a partial perspective view is also shown, taken from a different point of view;

Figure 2 represents a central vertical section of the boiler; and

Figure 3, a central longitudinal section of the same.

To enable others skilled in the art to make and use our invention, we will now proceed to describe fully its construction and method of operation.

A represents the furnace, which contains the boiler B, as shown.

C represents the supply-tank for the boiler.

D represents the main reservoir, from which the supply of water is drawn; and

E represents the steam-chamber in which the steam is stored, and from which it is conveyed to any desired point.

a represents the pipe which connects the supply-tank C with the boiler B, by means of which the necessary supply of water is kept up.

b represents a pipe connecting the upper part of the supply-tank with the upper chamber of the boiler, by means of which the pressure in both chambers is equalized.

c represents the pipe which connects the lower chamber of the boiler with the upper.

d represents the pipe connecting the upper chamber of the boiler with reservoir E, by means of which the steam is conveyed from the former to the latter.

e represents the pipe connecting the main water-reservoir D with the supply-tank C, by means of which water is supplied as may be necessary.

f represents a pipe connecting the tank E with the pipe *a*, by means of which the contents of the former may be drawn off, if desired.

The boiler B is peculiar in its construction. It consists of two vessels or chambers, b^1 b^2, of the same shape and size, which are provided with diaphragms b^3 b^4, as shown, and are united at about their centers, by means of a nipple, b^5, as shown in fig. 2, sheet 2.

It will be observed that the upper end of this nipple is flush with the bottom of the upper chamber, but extends a short distance below the top of the lower chamber. By means of this arrangement any water which may be condensed from the steam in the upper chamber is permitted to flow back into the lower chamber.

It will be observed that the sides of the boiler are inclined, and the sides of the furnace, in which it is inclosed, correspond with it in shape. The advantages of this construction will be perceived upon careful consideration.

The boiler is brought into close contact with the fire, which, in fact, envelopes its lower part. Intense heat is thus quickly and easily obtained from a small amount of fuel.

The manner of operating our improved apparatus, when used for the generation of steam, will now be described.

Water is admitted into the lower section of the boiler B from the tank C, by means of the pipe *a*, until it is filled, the height of the water being determined by the water-gauge *g* in the usual manner. The fire may now be started, and, as the water is heated, the generated steam will be driven in the direction of the arrows, (fig. 3, sheet 2,) out of the chamber b^1 through the pipe *c* into chamber b^2, when it becomes superheated, and thence out through pipe *d* into reservoir E, from which it may be conveyed to any desired point.

The pipe *d* is provided with an ordinary steam-gauge, to indicate the pressure of the steam, and the tank E is supplied with a safety-valve of any proper construction.

Any water which may collect in tank E, from the condensing steam, may be drawn off by means of the pipe *f*.

When it is desired to replenish the supply-tank C with water from the tank D, the stop-cocks *h*, sheet 1, and *h'*, sheet 2, fig. 1, are closed, by which means the connection between the supply-tank C and the boiler is cut off. The blow-off cock *i* upon the tank is then opened, and the steam allowed to pass off. The valve *j* now being opened, the water from water-reservoir D will pass directly into the supply-tank by means of its own gravity, the pressure of steam from the boiler having been cut off from the tank, by means of the valves described, and the steam having been allowed to escape from the tank itself.

When our improved apparatus is used as a hot-water heater, the supply-tank C is not used.

The tank E is filled with water from tank D, by

means of the pipe *e*, which connects with the pipe *a;* or it may be drawn from the tank E by means of the pipe *f*, the tank E being replenished from the tank D.

The special form and arrangement of our apparatus are especially adapted for a hot-water heater, inasmuch as a large supply of heat is obtained from the consumption of a small amount of fuel.

The boilers are provided with the usual hand-holes and openings, for cleaning purposes.

We do not limit ourselves to the precise position of parts shown, nor to the precise arrangement of pipes, but design, in practice, to make such changes as may be necessary in the varying circumstances of the case.

Having thus fully described our invention,

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The boiler B, constructed specifically as described, of the parts b^1 and b^2, connected by the nipper b^5, and having the diaphragms b^3 b^4, as set forth.

2. The combination of the boiler, constructed specifically as described, with the furnace A, the boiler and furnace being both provided with inclined sides above and below, as set forth.

3. The apparatus described, consisting of the furnace A, boiler B, tank C, reservoirs D and E, with their various connections, when constructed and arranged substantially as described, for the purpose set forth.

This specification signed and witnessed this 16th day of June, 1870.

JAMES RIGBY.
PHILIP A. PALMER.

Witnesses:
F. A. WHEELER,
Mrs. P. A. PALMER.