D. B. BROWN.

STEAM HOUSE FURNACE.

No. 176,508. Patented April 25, 1876.

FIG 1.

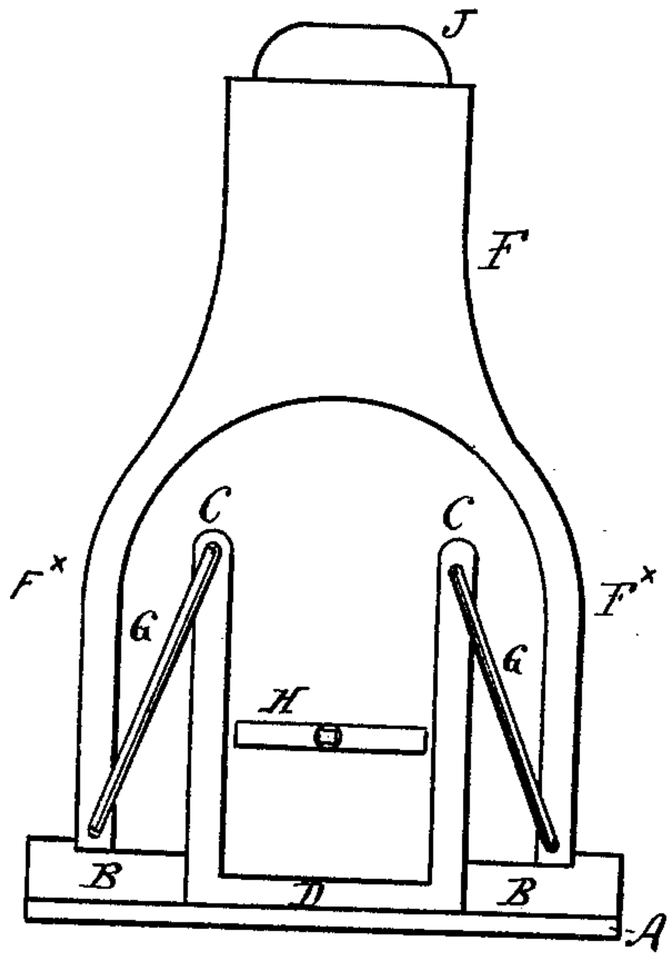


FIG 3

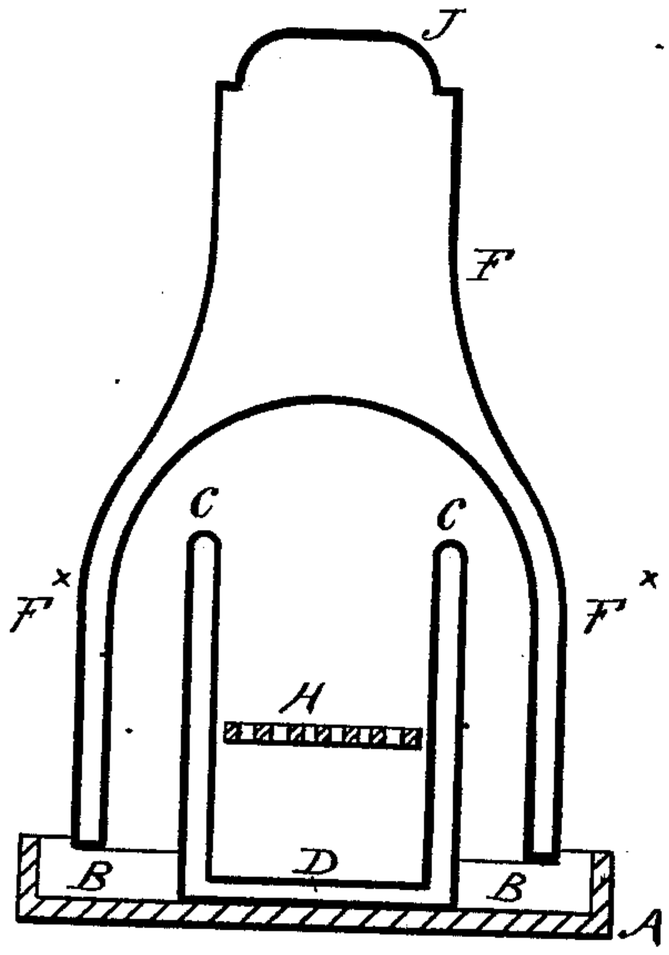


FIG. 2.

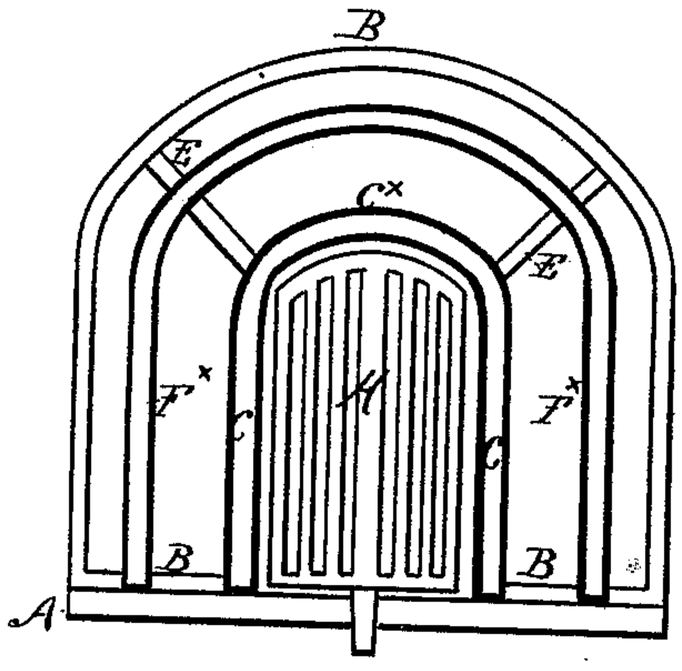
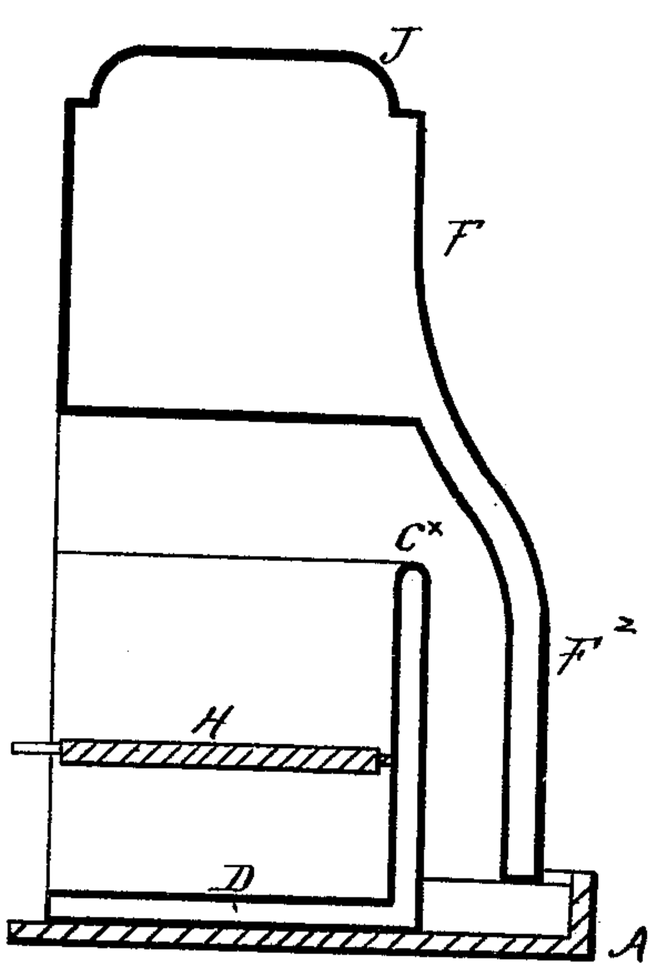


FIG 4.



WITNESSES.

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DEXTER B. BROWN, OF WALTHAM, MASS., ASSIGNOR TO HIMSELF AND RUFUS GREEN BROWN, OF SAME PLACE.

IMPROVEMENT IN STEAM HOUSE-FURNACES.

Specification forming part of Letters Patent No. **176,508**, dated April 25, 1876; application filed April 3, 1876.

To all whom it may concern:

Be it known that I, DEXTER BRUCE BROWN, of Waltham, Middlesex county, State of Massachusetts, have invented a new and Improved Steam House-Furnace, of which the following is a specification:

The invention is a modification of a furnace, the same provided with a hollow case or cases, pipes, &c., which are filled with water, which is converted into steam; and the object is the heating of houses, halls, rooms, &c., economically.

In the drawings the brick and other surroundings are removed; the metallic front is also removed, the drawings showing only the other metallic portions of my device.

Figure 1 is a front view, with the face-plate, carrying the grate-door and the ash or draft door, removed. Fig. 2 is a horizontal section across the furnace grate-bar. Fig. 3 is a vertical section parallel with the front view. Fig. 4 is a vertical section at right angles to the plane of Fig. 3.

In the drawings, A, in all the figures, is the bottom plate or platform, seen in Fig. 2 to be of a **D**-shape, (the curve of the **D** being at the back,) provided (see B B B, Fig. 2, B B, Fig. 3, B, Fig. 4,) with an upright flange at a little distance from its edge on the front side, and at its edge on the other sides. C C, Fig. 1, C C C^x, Fig. 2, C C, Fig. 3, C, Fig. 4, are the fire-walls, being a hollow casting attached (cast on) to the platform A in the form, as seen in front, of two upright hollow slabs of metal proceeding perpendicularly upward to nearly half the height of the whole device represented, and connected at the back side by a similar wall, C^x, Figs. 2 and 4, which is seen in Fig. 2 to be nearly semicircular in horizontal section. D, Figs. 1, 3, and 4, is the fire-box, being a hollow flat slab of metal attached to (being cast with) the fire-walls and platform A, the inner cavities of both being in full communication.

Resting upon the front flange B B (see Fig. 2) of the platform A at the front portion of the device, and resting at the back side upon two webs or upright projections from the platform E E, Fig. 2, is the shell F F^x F^x, Figs. 1 and 3, F^x F^x F^z, Fig. 2, F F^z, Fig. 4, which shell is a hollow casting of shape, in front, as seen in Figs. 1 and 3; in its lower part, in horizontal section, as seen in Fig. 2, and in vertical section at right angles to the plane of its front surface, as seen in Fig. 4. This shell bears at its top, lying upon its upper end, the shell-cap J, Figs. 1, 3 and 4, firmly bolted to it, and bears also (see Fig. 1) two pipes, G G, proceeding at its front side from near the bottom of the portions F^x F^x diagonally inward and upward to the upper front edges of the fire-walls C C, Fig. 1; these pipes thus putting in full communication the inner cavities, respectively, of the fire-walls C C and the shell F. I sometimes use two or more pairs of these pipes, and I do not confine myself to any special location of the points or apertures at which the pipes enter, respectively, the shell F or the fire-walls.

H, Figs. 1, 2, and 3, is the fire-grate, seen in front in Fig. 1, from above in Fig. 2, and in vertical cross-section in Fig. 4. This grate H is constructed in the usual manner, and hangs between the two side portions and the back portions of the fire-walls about half-way up their height, and is held by two shafts, (see Fig. 2,) cast, respectively, on the front and back ends (in the center horizontally) of the grate, which shafts enter, respectively, at the back end, into a perforated boss cast on the inner side of the back portion C^x of the fire-walls, and at the front end of the grate into an aperture in the front plate of the device. This front plate is not represented in the drawings, as it differs in no respect from the ordinary furnace front plates. It carries the usual grate-door, and beneath the ash-door, which, being opened or closed, answers as a damper. The latter is, in practice, actuated by a device attached above to the shell cap J, and governed by the pressure of steam in the shell. This damper apparatus, being common, and not invented by me, is not represented in the drawings.

The usual three steam-cocks and water-cocks, and the usual device (preferably placed at the lower and outer side of the portion of the shell marked F^x, say, at the right hand) for admit-

ting a supply of water to a boiler—also a steam safety-valve—are used but not represented, being common with all steam-boilers.

A series of pipes, greater or less in number, proceeds from the top of the shell-cap J to the rooms and locations it is desired to heat, being generally connected with one or more steam-radiators. These pipes, &c., being a common device, it has not been thought necessary to represent them.

I sometimes cause my fire-box to project in front farther than is represented in Fig. 2. It is to be noted that the lower back portion F^z of the shell F is curved inward at a short distanced from the platform A, this part being thus more directly exposed to the current of hot air.

The operation of my invention is as follows: The device is supposed to be furnished with its metallic front, and to be built into its brick covering with the intervening air-space, and furnished with air and smoke flues, in the usual manner.

The water being let into the shell F to a height, say, three-fifths the distance between the arch seen in Fig. 1, and the shell-cap J, the fire is kindled on the grate H. The heat of radiation downward, and that of the dropping ignited coals, is imparted to the upper surface of the fire-box D, and thus to the water within. The radiating heat also impinges on the inner surface of the fire-walls C C C^x with the same effect, and the current of smoke and heat passing up acts upon the lower surface of the dome of the shell, as seen in Figs. 1, 3 and 4, and then passing over the top of the fire-wall passes downward, acting upon the outside of the fire-walls and upon the inside of the parts F^x F^x, Figs. 1 and 3, and F^z, Fig. 4, of the shell F. The current of smoke and heat then passes under these lower portions of the shell F, and thence enveloping the outside of the shell, and filling the space between it and the brick, the smoke and what heat remains, as not having been imparted to the shell and its contents, passes off through the usual smoke-flue. The great superficial area of water-containing metallic vessels exposed to the impact of heat by the construction of this device of mine forms its peculiar advantage.

I claim—

In steam-heaters, the combination and arrangement of the platform A and the grate H, with the fire-box D, the fire-walls C C C^x, the connecting-pipes G G, the shell F F^x F^x F^z, and the shell-cap J, all constructed and arranged substantially as described and shown.

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Witnesses:

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