

C. D. HARVEY.

GRATE AND HOT WATER HEATER.

No. 173,004.

Patented Feb. 1, 1876.

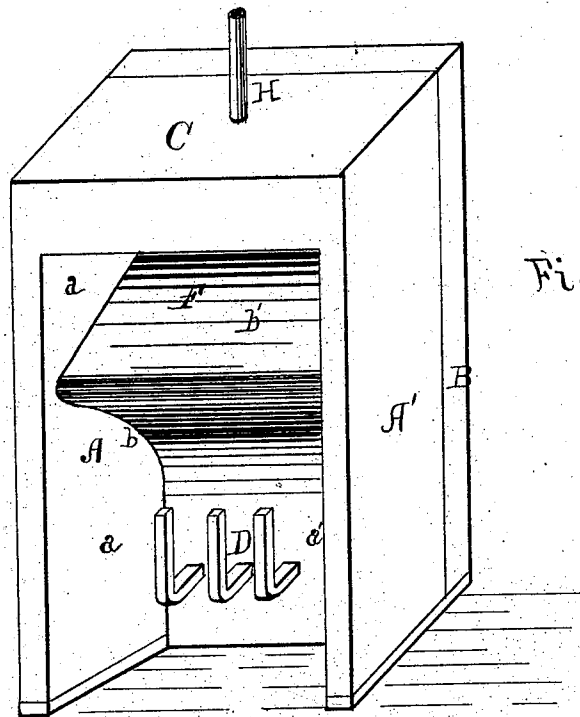


Fig. 1.

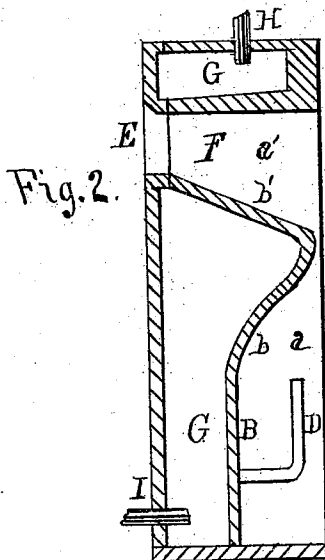


Fig. 2.

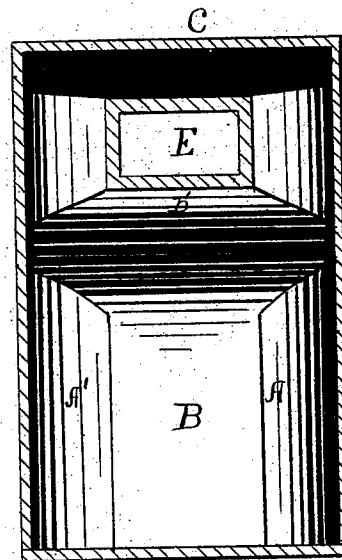


Fig. 3.

Attest:
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UNITED STATES PATENT OFFICE.

CHARLES D. HARVEY, OF SPRINGFIELD, ILLINOIS.

IMPROVEMENT IN GRATES AND HOT-WATER HEATERS.

Specification forming part of Letters Patent No. **173,004**, dated February 1, 1876; application filed August 7, 1875.

To all whom it may concern:

Be it known that I, CHARLES D. HARVEY, of Springfield, in the county of Sangamon and State of Illinois, have invented new and useful Improvements in Combined Grate and Hot-Water Heater; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of my invention is to heat several rooms in a building by a grate placed in one of the rooms thereof; and my invention therein consists in the construction of the grate, all as more fully hereinafter explained.

To enable others skilled in the art to make and use my device, I proceed to describe the same in connection with the drawings, in which—

Figure 1 is a front perspective view of the grate; Fig. 2, a central vertical section of the same; Fig. 3, a back elevation of the same, with the back wall or plates removed.

Like letters denote similar parts in each figure.

A A' represent the side, B the back, and C the top, walls of the grate, which are all composed of inner and outer thin iron plates, joined together, inclosing one entire space, G.

D represents the grate-bars, hung to the inner plates of the side and back walls in any suitable manner. The inside plates *a a'* of the side walls diverge from the inner plate of the back wall to the front of the side walls, thus contracting the water-space at its forward end, and placing the bulk of the water in the back and side walls, near the grate-bars, where the fire would heat such walls the most. The back wall B has its inner plate curved out above the grate, as shown by *b*, thus subjecting the part curved to the direct action of the fire in the grate-bars, and enlarging the water-space at this point. The inner plate of the back wall, after making this turn, extends back on an incline, forming a surface, *b'*, to a passage, E, which is cut through the outer plate of the back wall, and connects with the chimney E'. The curve in the back wall forms a hot-air chamber, F, whose sides are the diverging surfaces *a a'* of the side walls, the inclined surface *b'* its bottom, and the under plate of the top wall forming its top.

H is an exit-pipe, which connects with the

space G through the top wall, and is connected with suitable radiators in other parts of the building. I is a return pipe, connecting with the water-space G of the grate through the back wall near its bottom, and also connected with the radiators.

The method I prefer for supplying water to my grate, and radiators or coils connected therewith, is as follows: A tank is placed in the building at a point higher than any radiator, and is connected with the nearest pipe leading to the grate. This tank has an open top, and is kept supplied with water by any suitable means. The advantage of an open tank is, that all the steam which may be generated and all the air in the pipes find an outlet through it.

The operation of my device is as follows: The water-tank being nearly filled with water, all the radiators, pipes, and the hollow grate would be filled also. A fire being built in the grate and the water being heated, the hot water would be forced up through the pipe H by the colder water in the pipe I and grate, the water would keep up a constant circulation, increasing in heat, the steam which is generated passing up through the tank.

Having thus described my invention and some of its advantages, what I claim as new, and desire to secure by Letters Patent, is—

In combination with an open fire-place grate, the following elements, viz: the side, back, and top walls, composed of inner and outer iron plates, joined together; a single water-space, G, inclosed by the said inner and outer plates, and extending around the back, sides, and top of the combustion-chamber; an exit-pipe leading from near the top of the water-space; and a return-pipe leading from near the bottom of the said water-space, both of said pipes being adapted for connection with suitable radiators in other parts of the building, whereby the said radiators are heated by water circulated through the said water-space, substantially as described.

This specification signed and witnessed this 18th day of June, 1875.

CHARLES D. HARVEY.

Witnesses:

SAMUEL D. SCHOLES,
T. C. MATHER.