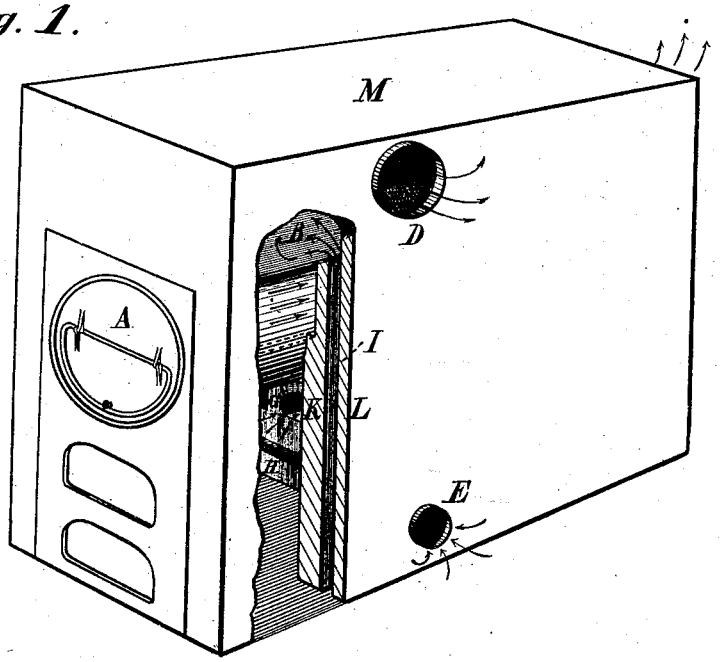
2 Sheets—Sheet 1.

C. STEWART.

HEATING-FURNACE.

No. 192,092. Patented June 19, 1877.

Fig. 1.



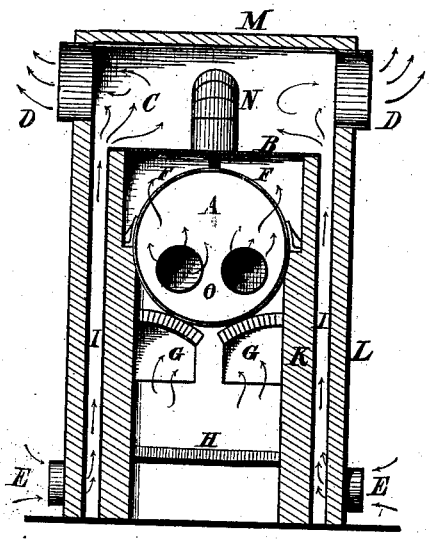


Fig. 2.

WITNESSES;

Edward H. Hill,
Santiago Verte

INVENTOR;

Chas. Stewart.

BY HIS ATTY.

James G. Arnold.

2 Sheets—Sheet 2

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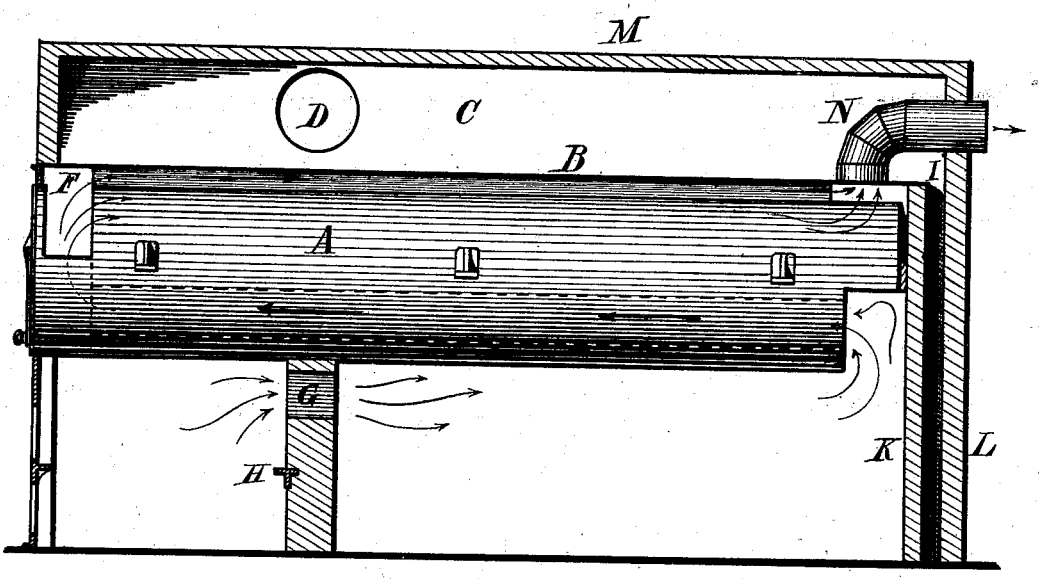
Fig. 3.



WITNESSES;

Edward H. Hill.

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BY HIS ATTY;

James G. Arnold.

UNITED STATES PATENT OFFICE.

CHARLES STEWART, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN HEATING-FURNACES.

Specification forming part of Letters Patent No. **192,092**, dated June 19, 1877; application filed November 2, 1876.

To all whom it may concern:

Be it known that I, CHARLES STEWART, of the city and county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in Heating-Furnaces, which are described in the following specification and drawings.

My invention is designed to economize the heat where a boiler is used for heating water or making steam, to burn the fuel advantageously, and save a large per cent. of heat usually wasted by radiation.

Its nature consists in combining a hot-air chamber, having an open space from it down around the furnace, and a metal bottom covering the flues over the top of the boiler; and in making a fire-proof arch in the back wall of the fire-box, the arch being molded to fit the curve of the boiler, or formed of separate fire-brick in an arch form over the flame and between that and the boiler at the bridge-wall, allowing the flame beyond to impinge against the boiler.

Figure 1 in the accompanying drawings shows a perspective view of a boiler and furnace embodying my invention, a part of one side being removed, showing the inside; Fig. 2 showing a cross-section near the back part of the fire-box.

The same letters indicate the same parts wherever they occur.

A is the boiler, supported by the walls K, which I continue a little higher than the boiler, and on them lay the plate B, with a middle support on the boiler, making two flues, F F, over the boiler. C is the hot-air chamber over the plate B, and its sides continued down around the walls K with a space, I I, and entrances E E, to admit the cold air, the heated air being taken away at D D or from the top of C. H is the usual bridge-wall back of the grate, and G G two arches therein, presenting a bridge or arch between the boiler and the flame. This being heated to a white heat assists the perfect burning of the smoke and combustible gases, which in the common form of construction, without these bridges, are allowed to impinge directly against the boiler, and thereby become too cold to burn. When mixing with the air of the chamber, that side of the wall H, and the eddy or curl formed by them, assists in the entrance and mixing of said air with the hot gases, the flames thence passing to the back end of the boiler, then up and through the flues O to the front, and thence up and through the flues F F to the pipe N and chimney.

The other parts not described may be of almost any of the usual forms of construction adapted to their places.

I am aware that heating-chambers over boilers have been used of various constructions. These I do not claim; but

What I claim as new, and desire to secure by Letters Patent, is—

1. The heating-chamber C, having the space I I surrounding the walls K and a metal plate, B, between it and the flues F F, in combination with the boiler A and the flues F F over it, constructed and operating in the manner and for the purposes described.

2. The arches G G over the openings in the wall H, in combination with the chambers on each side of the wall H and boiler A above the opening, whereby the flame after contact with the boiler is depressed, and, passing under the arches, comes again in contact with it, with an eddy or curling motion, mingling with the air of the second chamber, as and for the purposes set forth.

Witness my hand this 21st day of October, A. D. 1876.

CHARLES STEWART.

Witnesses:

JAMES BRIERLY,

J. G. ARNALL.