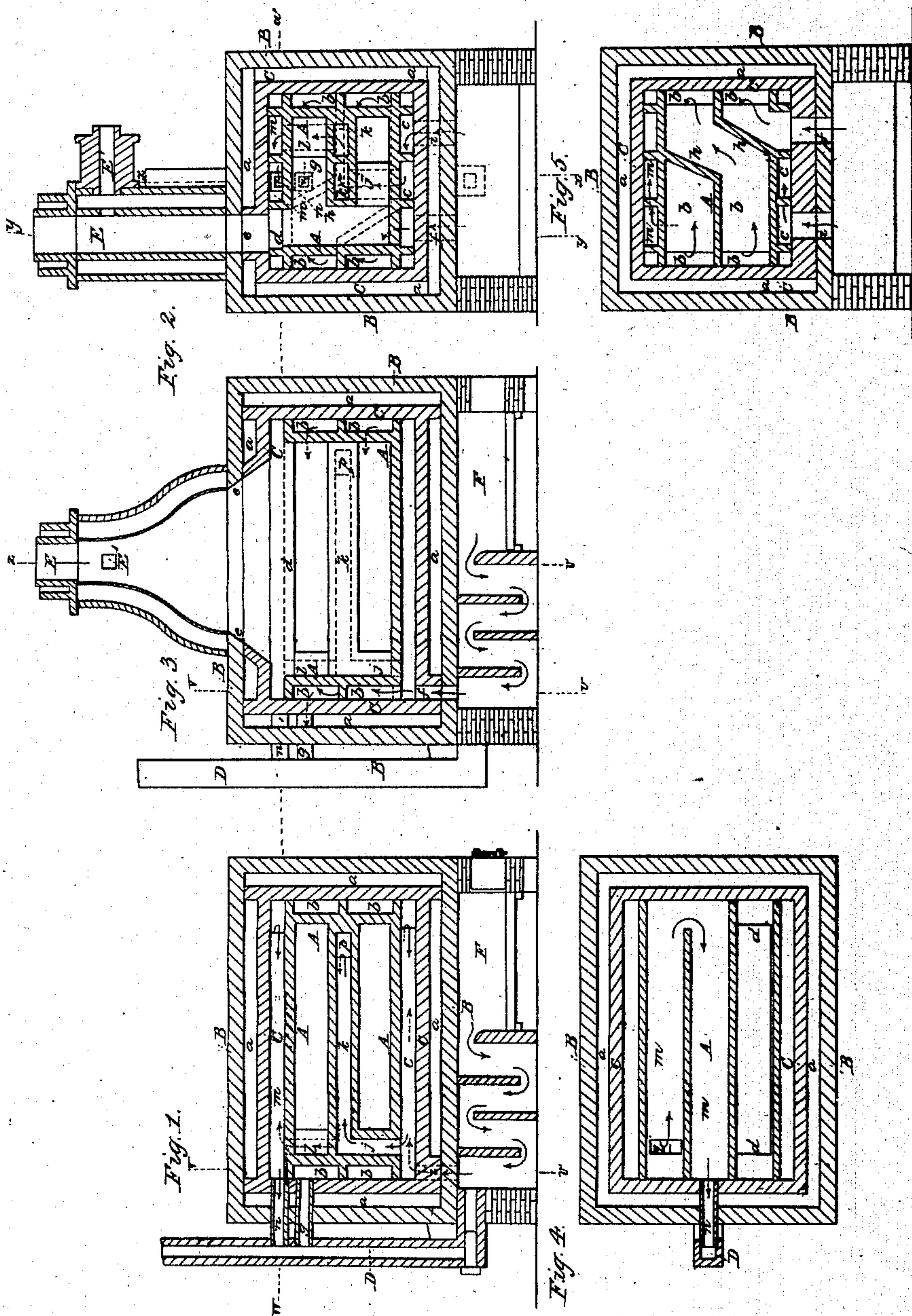


*J. Chittcott.*

*Hot-Air Furnace.*

*N<sup>o</sup> 49,504.*

*Patented Aug. 22, 1865.*



*Witnesses:  
J. W. Combs.  
G. W. Reed.*

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# UNITED STATES PATENT OFFICE.

JOHN CHILCOTT, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. 49,504, dated August 22, 1865; antedated August 15, 1865.

*To all whom it may concern:*

Be it known that I, JOHN CHILCOTT, of No. 70 Fulton street, in the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Hot-Air Stoves and Furnaces for Warming Buildings and Apartments; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of a hot-air furnace in the plane indicated by the line *x x* in Fig. 2. Fig. 2 is a transverse vertical section of the same in the plane indicated by the line *z z* in Fig. 3. Fig. 3 is a longitudinal vertical section of the same in the plane indicated by the line *y y* in Fig. 2. Fig. 4 is a horizontal section of the same in the plane indicated by the line *w w* in Figs. 1, 2, and 3. Fig. 5 is a transverse vertical section of the same in the plane indicated by the line *v v* in Figs. 1 and 3.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to stoves and furnaces for warming buildings and apartments by the introduction of heated air, or by producing a constant circulation of the air in the building or apartment by contact with the heated surfaces of the stove or furnace.

Its object is partly to economize fuel and partly to obtain a large heating-surface at a moderate heat, and thereby obviate the unpleasant effects of very highly-heated surfaces; and to this end it consists, first, in surrounding an air-heating chamber with a continuous system of flues, through which the gaseous products of combustion from a fire below the said chamber are caused to circulate around and in contact with the exterior of the said chamber before passing to the chimney or uptake; secondly, in providing within the said chamber a continuous system of flues, through which a portion of the gaseous products of combustion are caused to circulate back and forth on their way to the chimney or uptake, while a portion of such products circulates continuously back and forth in contact with the exterior of the said chamber.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A is an air-heating chamber of parallelopipedal or other suitable form, made of iron or other suitable material, and inclosed within a double casing, B C, consisting of an outer shell, B, and an inner shell, C, of brick-work, iron, porcelain, or other suitable material, having a closed air-space, *a*, between them, which is filled with air to act as a non-conductor of heat. Between the vertical sides of the chamber A and the inner shell, C, there is a continuous series of flues, *b*, which entirely surround the chamber, and through which a portion of the gaseous products of combustion from the fire-place F below, entering the casing B C through an opening, *f*, (Figs. 2, 3, and 5,) in the bottom, will circulate entirely around the said chamber before escaping to the chimney D through a pipe, *g*, Fig. 1. The manner in which the lower flue, *b*, is connected with the upper one to render the circulation of the gases continuous is represented at *h* in Figs. 2 and 5.

Only two flues, *b b*, are represented, but there may be three or more, so that the circulation of the gases may be three or more times entirely around the chamber A.

Between the shell B and the bottom of the chamber A there are flues *c c*, through which another portion of the gases from the fire, entering the casing B C through an opening, *i*, in the bottom, circulate back and forth one or more times before entering the continuous series of flues *j k k l*, provided within and extending through the chamber A, and from whence the said portion of the gases escapes into a continuous series of flues, *m m*, between the top of the chamber A and the shell B, and thence through a pipe, *n*, to the chimney D.

The flues *k k*, which extend longitudinally and horizontally through the chamber A, are represented as only two in number, but their number is not limited; and by a proper number of them, and a suitable arrangement of openings *p*, Fig. 1, at opposite ends alternately, the gases may be made to circulate back and forth through the interior of the chamber A.

In the top of the air-heating chamber A there is an opening, *d*, communicating with an opening, *e*, in the top of the casing B C, for the exit of the warmed air from the said chamber through a pipe or duct, E, which leads into the apartment or apartments to be warmed, with a branch, E', communicating to each apartment when more than one is to be warmed by



the same furnace. This duct is made with double walls to prevent loss of heat by radiation.

I have represented no means of introducing fresh air into the chamber A, as this may not be necessary, an upward circulation of the heated air from the said chamber through the duct E to the apartment or apartments to be warmed causing at the same time a downward circulation of cooler air from the apartment through the said duct to the chamber A.

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

1. Surrounding the air-heating chamber of a stove or furnace with a continuous system of

flues, *b b*, substantially as herein described, in which the gaseous products of combustion from the fire are caused to circulate continuously two or more times completely around the said chamber before passing to the chimney, substantially as herein set forth.

2. In combination with the continuous system of flues *b*, surrounding the sides of the air-heating chamber, the continuous system of flues *c j k l m*, under, through the interior of, and above the said chamber, substantially as herein described.

Witnesses:

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J. W. COOMBS.