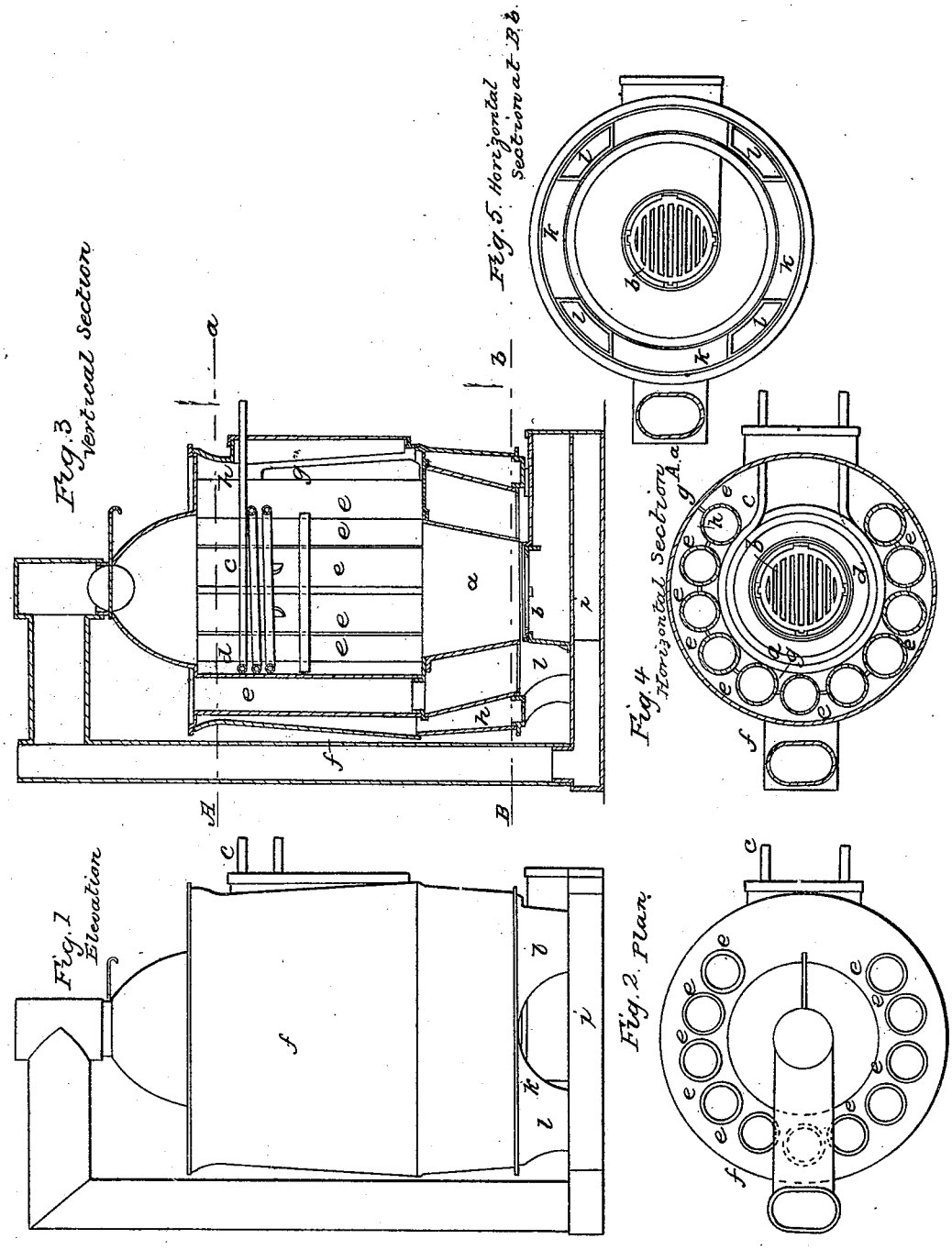
G. E. WARING.

Hot Air Furnace.

No. 7,863. Patented Dec. 24, 1850.



UNITED STATES PATENT OFFICE.

GEORGE E. WARING, OF STAMFORD, CONNECTICUT.

HOT-AIR FURNACE.

Specification of Letters Patent No. 7,863, dated December 24, 1850.

To all whom it may concern:

Be it known that I, GEORGE E. WARING, of Stamford, in the county of Fairfield, Connecticut, have invented certain new and useful Improvements in Heating Furnaces, and that the following is a full, clear, and exact description of the principle or character which distinguishes my invention from all other things before known, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is an elevation of my improved furnace; Fig. 2 a plan; Fig. 3 a vertical section; Fig. 4 a horizontal section taken at the line A, *a*, of Fig. 3, and Fig. 5 a horizontal section taken at the line B, *b*, of the same figure.

The same letters indicate like parts in all the figures.

The object of the first part of my invention is to distribute the heat equally over the radiating surface of the furnace; and with this view consists in carrying the heat and products of combustion up to the top of the furnace and then causing them to descend between a cylinder of tubes surrounding the fire pot, and the exterior casing of the furnace, the said tubes being connected together by short partitions, thereby forming an annular flue between them and the external casing of the furnace down which the heat and products of combustion descend. And the second part of my invention consists in the use of a distributer, which not only admits of the free circulation through it of the external air, but by means of arched passages or channels opening into the annular flue above mentioned, causes the heat and products of combustion (which have been brought down the said cylindrical flue) to enter the exit chamber which forms the base of the furnace and back to the smoke pipe. And the third part of my invention consists in admitting the air to be warmed into a chamber warmed by radiation from the fire pot and from the descending current from the fire and then causing the same to pass up through the body of the furnace through a series of tubes arranged in the form of a cylinder, into the external air at the top of the furnace, the said cylinder of tubes being heated by the radiation of the heat from the fire pot which they surround and from the descending current which surrounds them.

In the accompanying drawings (*a*) represents the fire pot, (*b*) the grate bars, and (*c*) a worm tube for heating water which may be dispensed with at pleasure. The heat and products of combustion rise to the top of the chamber of combustion (*d*) and are carried over and down an annular flue (*h*) between the cylinder of tubes (*e*) surrounding the fire pot (*a*), and the external casing (*f*) of the furnace, the said tubes being connected together by partitions (*g*), by which means the heat evolved by the products of combustion in descending the whole height of the furnace is equally distributed over the external casing of the furnace, and thence radiated therefrom.

Between the bottom of the fire pot and the exit chamber (*i*), which forms the base of the furnace is located what I call the distributer (R). It is simply an annular chamber for the reception of the heat and products of combustion which are carried through it by arch channels (*l*) which open into the bottom of the annular flue (*h*) before described. The arched channels (*l*) of which there may be any desired number, though in the present but four are represented, not only serve to carry the heat and products of combustion to the exit chamber (*i*) but also from openings for the free circulation of the external air around the fire pot for a purpose to be presently described. The air from the room, entering under the arches of the distributer circulates freely around the fire pot and is heated by radiation thereupon and from the distributer and exit chamber; it then ascends through the tubes to the top of the furnace and is delivered into the room again in a highly heated state.

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

1. The annular flue between the cylinder of tubes and the external casing of the furnace for the purpose of distributing the heat, equally over the external casing, substantially as described.

2. I also claim the distributer or annular distributing chamber provided with arched passages for the purpose of carrying the heat and products of combustion to the exit chamber, and which also admit of the free circulation of the external air in and around the fire-pot, substantially in the manner and for the purpose described.

GEO. E. WARING.

Witnesses:

ALEX. PORTER BROWNE,

I. N. MCINTIRE.