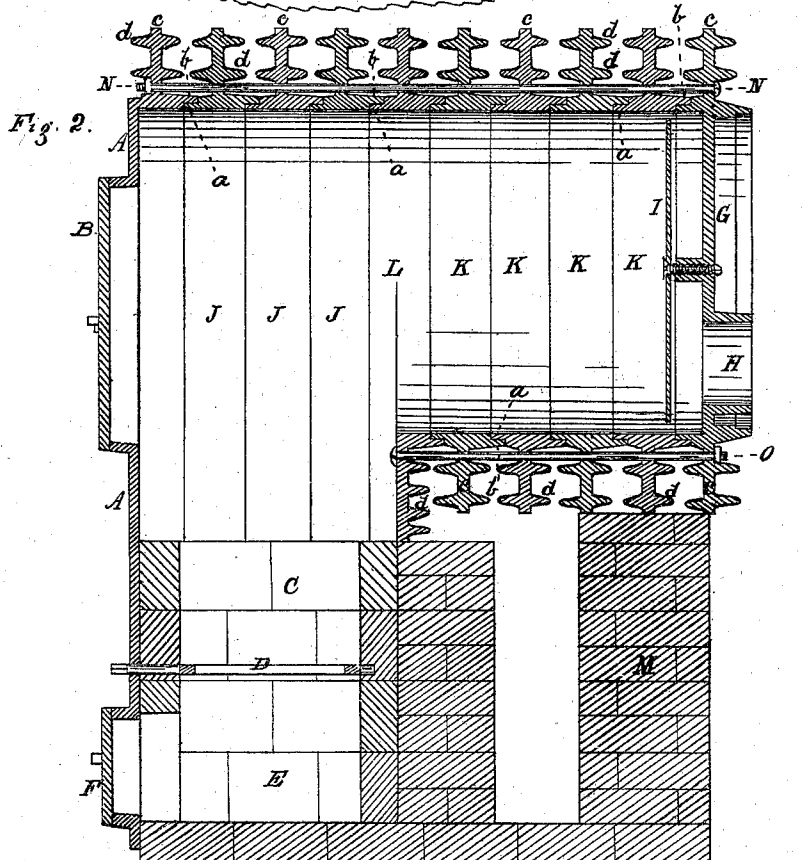
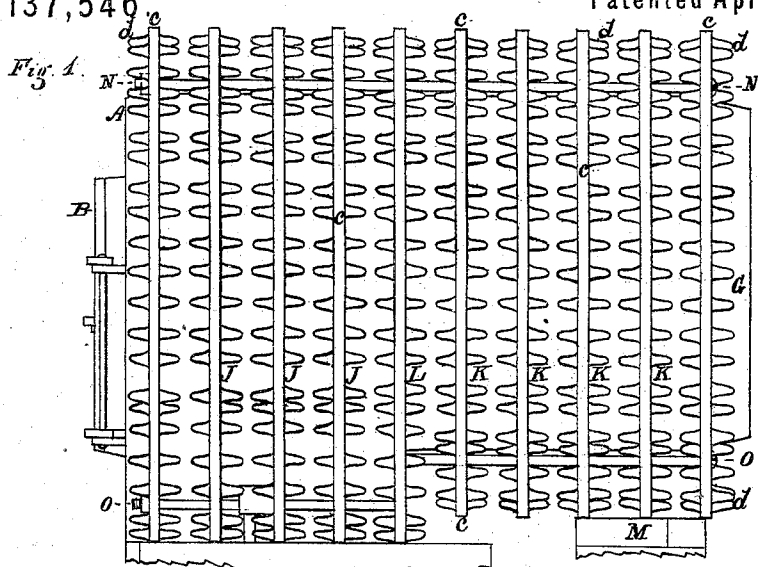


S. F. GOLD.
Hot-Air Furnaces.

No. 137,546

Patented April 8, 1873,



Saml. F. Wightman
Anna M. Northrop } Witnesses.

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atly

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Fig. 3.

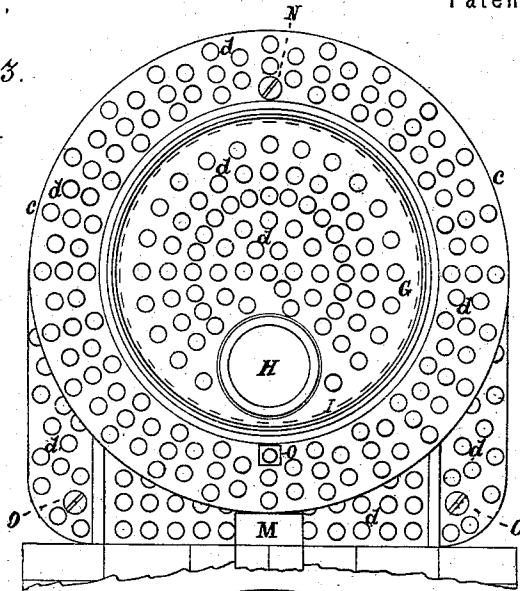
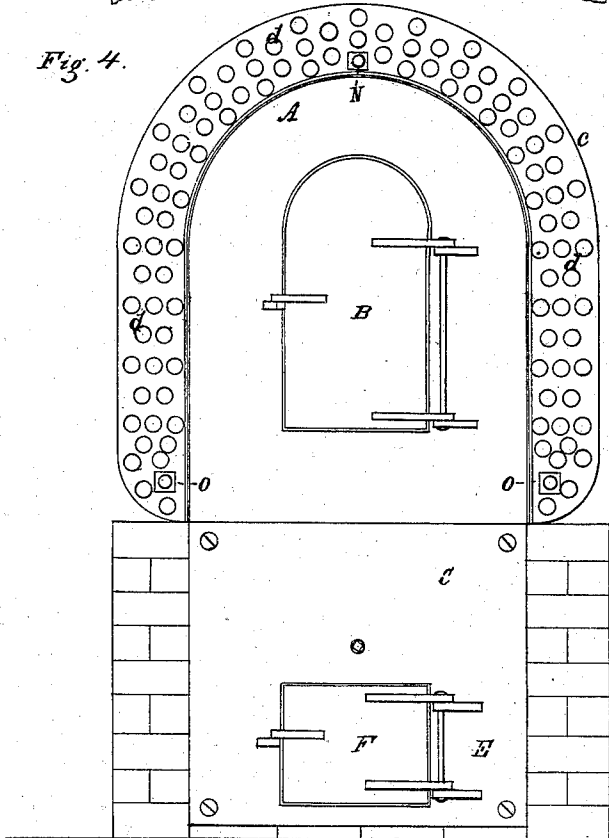


Fig. 4.



Saml. S. Wightman.
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UNITED STATES PATENT OFFICE

SAMUEL F. GOLD, OF ENGLEWOOD, NEW JERSEY.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **137,546**, dated April 8, 1873; application filed August 5, 1872.

To all whom it may concern:

Be it known that I, SAMUEL F. GOLD, of Englewood, in the county of Bergen and State of New Jersey, have invented certain Improvements in Hot-Air Furnaces, of which the following is a specification:

Nature and Object of the Invention.

The principal objects of this invention are to furnish such an amount and arrangement of radiating-surface as will properly warm the air which is to be introduced into the rooms to be warmed without overheating any portion thereof so as to render it unfit for respiration; and also to provide such a construction that the capacity of the furnace may be readily increased or diminished to adapt it to the work to be performed. One part of this invention consists in the combination, with the shell of the furnace, of a series of flanges studded with projections, between which flanges and among which projections the air to be heated is made to pass, the said flanges being cast with and forming a part of the shell of the furnace, as hereinafter more fully set forth. Another part of this invention consists in the construction of the heating-chamber in sections adapted to form together a chamber for the products of combustion, having thereon flanges studded with projections, in the manner hereinafter described, by which the capacity of the furnace may be increased or diminished by the addition or removal of internal sections, as hereinafter more fully set forth. Another part of said invention consists in the arrangement of the smoke-pipe or exit-pipe for the products of combustion below the center of the chamber, from which they are taken by said pipe, and the arrangement of a disk or diaphragm in connection therewith, by which the products of combustion are made to pass around the same close to the periphery of the chamber, as hereinafter set forth.

Description of the Accompanying Drawing.

Figure 1 is a side view of the upper metal portion of a hot-air furnace constructed according to my invention. Fig. 2 is a vertical longitudinal section through the center of the same, and of the fire-box and the support at the rear end, on which it is set up for use. Fig. 3 is a

rear-end view of the upper metal portion. Fig. 4 is a front-end view of the upper metal portion and the fire-box.

General Description.

A is the front-end section of the upper metal portion of the furnace, which section is provided with a door, B, opening into the interior of the furnace, as shown. C is the fire-box. D is the grate. E is the ash-pit, and F is the door of the ash-pit. The fire-box should be made of brick to prevent the too rapid radiation laterally through its sides, which, if permitted, would overheat the air which might come in contact with it, and render it unfit for respiration. G is the back-end section of the upper metal portion of the furnace, which back-end section is provided with a proper aperture, H, to discharge the products of combustion into the smoke-pipe, and said back-end section also supports a disk, I, placed at a short distance from the plate of this section, which disk I is of such a size and so arranged as to leave a thin annular space all around it, as shown, for the products of combustion to pass, thus throwing these products of combustion to the periphery of the chamber, and thereby making them more effective in imparting heat to the rear sections. The heated products of combustion have a natural tendency to rise in the chamber, and if the aperture H was located in the middle of the back plate of the furnace, it is easy to see that the greater portion of the products of combustion would pass around the upper portion of the disk I; but to obviate this tendency, and to give an equal discharge of these products all around the disk I, I locate the aperture H below the center, as shown. J J are the intermediate sections of the front portion of the furnace, and K K are the intermediate back sections, between which front and back sections a section, L, is placed, which upon the front side has the form of the sections J J, and upon the back side has the form of the sections K K. The form of this upper metal portion of the furnace is represented as being nearly or quite that of a wagon-boiler, the rear end of which is represented in the drawing as being supported by a brick column, M. The sections J J, and also the sections K K, are formed to fit into each other with lapped

joints, as shown in Fig. 2, the inside portion of the lap being designated by *a* and the outside portion by *b*. These joints may be filled with stove-putty or any other suitable material to make them tight. N O are rods which secure the sections J J and K K together. *c c* are flanges, which project outward from each of the sections of the furnaces, and these flanges are all studded with projections *d d*, which project at right angles to the sides of the flanges *c c* and longitudinally of the furnace. These flanges *c c* are cast with the sections or sectional portions of the shell of the furnace, and form a part of said shell. The air to be heated is made to pass between these flanges and among these projections so as to cut it up into thin laminae or strata, and furnish a sufficiently large amount of radiating-surface to prevent any portion of the air from being overheated. The intermediate sections J J are all alike, as may be seen from an inspection of the drawing; and they may be and should be all cast from the same pattern or a duplicate thereof. The same remark also applies to the sections K K, and each of the sections J J and K K are provided with one or more flanges and projections, *c c* and *d d*, so that when the parts are put together a continuous series of channels partially divided or broken by projections is formed upon the outside of the furnace or chamber for the products of combustion, no matter what may be the number of internal or intermediate sections either in the front or back part of the furnace.

It will be obvious, then, from the foregoing considerations that the capacity of the furnace may be increased or reduced almost without limit by the addition or removal of internal or intermediate sections without interfering with the harmony of the construction, or destroying or deranging the air-channels formed be-

tween the flanges *c c* and among the projections *d d*.

I am aware that a steam boiler or generator has been constructed in such a manner as to allow its capacity to be increased or diminished by the addition or removal of internal sections, as set forth in the Letters Patent of the United States granted to me June 21, 1859. I am also aware that a series of steam-radiators studded with projections has been constructed in which the radiating capacity of the series can be increased or diminished by the addition or removal of radiators or sections, as set forth in the Letters Patent of the United States granted to myself and W. A. Foskett July 29, 1862; but these are not the features which I claim as constituting the present invention.

Claims.

I claim as my invention—

1. The combination, with the shell of the furnace, and cast therewith and forming part thereof, of the flanges *c c* and the projections *d d*, substantially as hereinbefore set forth.
2. The construction of the heating-chamber in sections adapted to form together a chamber for the products of combustion, and having thereon flanges *c* studded with projections *d*, substantially in the manner hereinbefore described, whereby the capacity of the furnace may be increased or diminished by the addition or removal of internal sections, substantially as hereinbefore set forth.
3. The arrangement of the smoke pipe or aperture H below the center of the smoke-chamber, in combination with the disk I, substantially as and to the effect hereinbefore set forth.

Witnesses: SAMUEL F. GOLD.

THOS. P. HOW,

ANNA M. NORTHROP.