(No Model.) 2 Sheets—Sheet 1.

G. T. FINLEY.

HOT AIR FURNACE.

No. 522,364. Patented July 3, 1894.

FIG. 1.

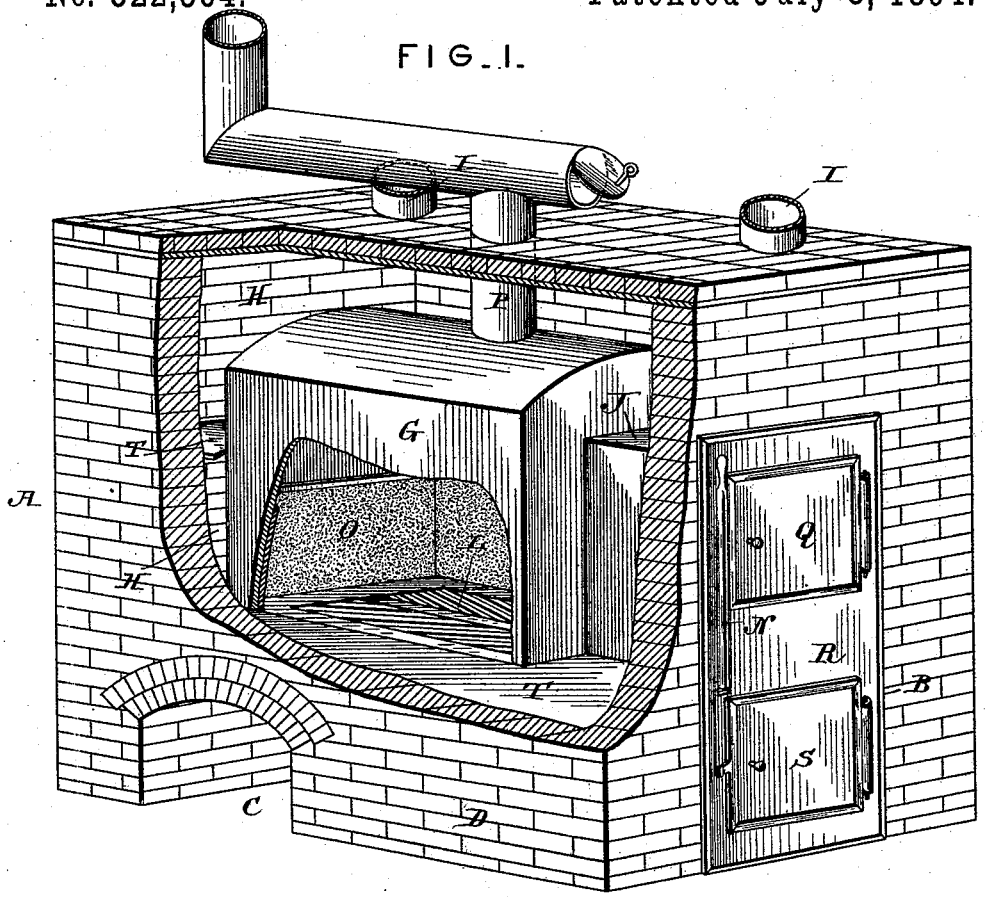
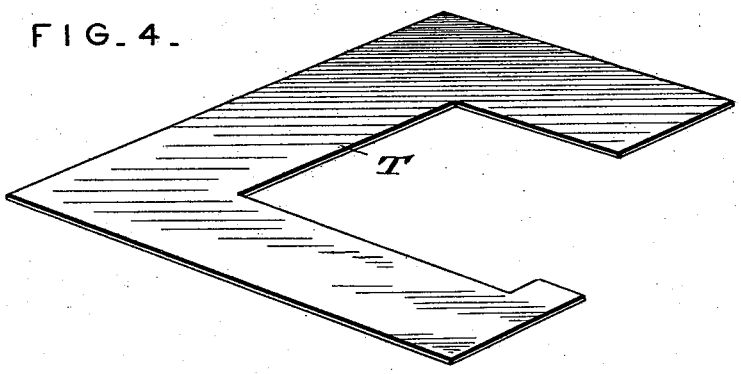


FIG. 4.



Inventor

George T. Finley.

Witnesses
Harry L. Amer.
D. P. Hochampleton

By his Attorneys.

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

G. T. FINLEY.

HOT AIR FURNACE.

No. 522,364. Patented July 3, 1894.

FIG. 2.

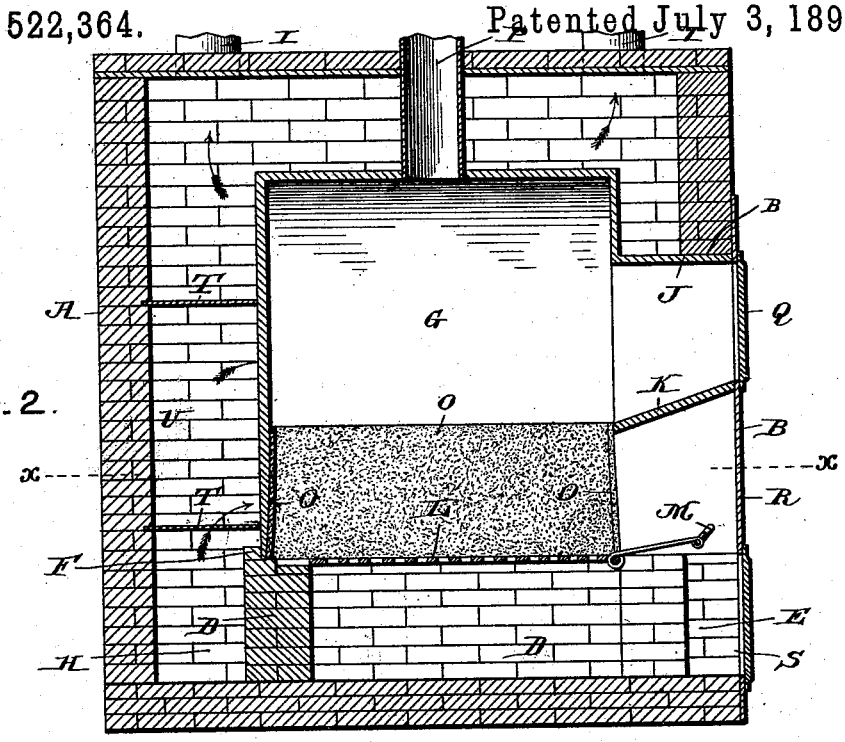
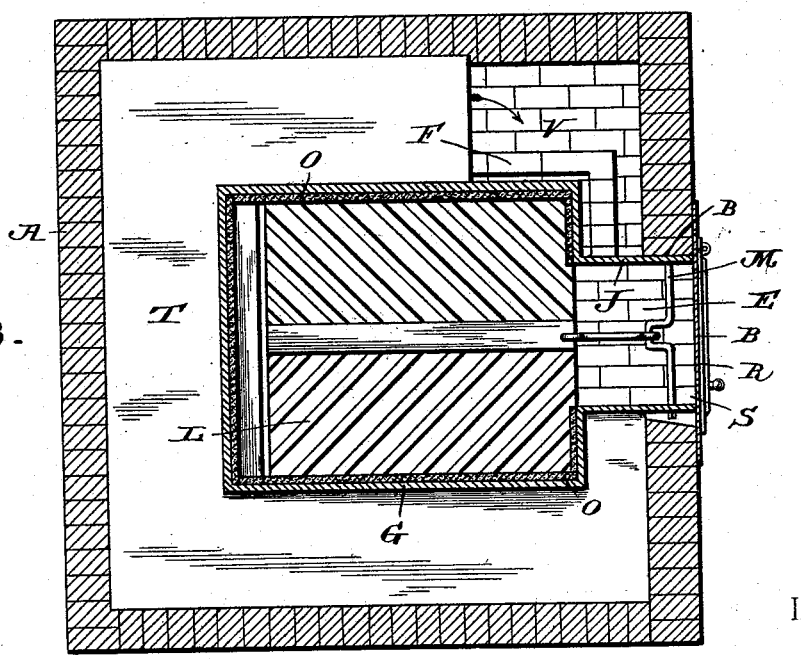


FIG. 3.



Inventor

George T. Finley.

Witnesses

Harry L. Amer.

D. P. Wolhaupter

By his Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

GEORGE T. FINLEY, OF WEST NEWTON, PENNSYLVANIA.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 522,364, dated July 3, 1894.

Application filed December 14, 1893. Serial No. 493,702. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. FINLEY, a citizen of the United States, residing at West Newton, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Hot-Air Furnace, of which the following is a specification.

This invention relates to hot air furnaces; and it has for its object to provide an improved hot air furnace which shall insure the thorough heating of the air before passing the same to the places to be heated, while at the same time effectually preventing smoke, gas, and other products of combustion from the fires mingling with such air.

To this end the main and primary object of the present invention is to provide a jointless fire-box in combination with other specific features of novelty which shall complete a furnace securing the results claimed.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view, partly broken away, of a hot air furnace constructed in accordance with this invention. Fig. 2 is a central vertical longitudinal sectional view thereof. Fig. 3 is a horizontal sectional view on the line *x*—*x* of Fig. 2. Fig. 4 is a detail in perspective of one of the horizontal partition plates.

Referring to the accompanying drawings, A represents an inclosing furnace casing forming the inclosing outer walls of the heating devices thereof, and provided at the front with a vertical front opening B, extending nearly its entire height, and at one side and the bottom thereof with a cold air opening or inlet C, which provides for the admission of cold air into the interior of the furnace casing, as will be more particularly referred to.

Built centrally within the inclosing furnace casing A, and on the bottom thereof is the raised ash pit wall D. The raised ash pit wall D, is rectangular in shape corresponding to the shape of the outer inclosing casing A, and is provided with a front opening E, communicating with the front opening of said casing, and the upper edge of the raised ash pit wall D, is provided with an inner shoulder F, adapted to snugly receive the lower edge of the dome-shaped fire box G. The fire-box G, is substantially rectangular in horizontal section to correspond with the shape of the outer inclosing casing and the raised ash pit wall D, inside thereof, and as is clearly illustrated in the drawings, the outer walls of the raised ash-pit wall and the fire box are disposed sufficiently in from the inner sides of the inclosing casing A, to form a hot air space H, inside of the casing, and surrounding the raised ash pit wall and the fire-box, thereby providing means for heating up the air admitted into the casing through the opening C, and causing it to circulate through the hot air pipes I, leading into the top of the casing, and which carry the heated air to the rooms or other places to be heated.

The dome-shaped fire-box G, is cast in one solid piece of metal without a single joint, and has projected from the front end thereof the integral extended end flange J, which registers in the vertical front opening B, of the furnace casing and is disposed in alignment with the front opening E, of the ash pit there-below, and inside of the projected end flange J, of the single-piece fire-box is built an inclined coal chute K, which declines toward the interior and bottom of the fire box to provide means for feeding the fuel onto the grate L. The grate L, is mounted to slide on top of the raised ash pit wall D, at the bottom of the fire-box, and has connected to one end thereof the shaker bar or rock shaft M, to one end of which is attached the lever N, for operating the bar and shaking the grate to relieve it of the ashes which fall into the ash pit there-below.

The inner sides of the fire box G, above the grate are lined with a fire-clay lining O, and the products of combustion escape from said fire box through the smoke flue P opening into the closed top thereof. The front fuel opening formed at the front upper end of the projected flange J, of the fire box is inclosed by the door Q, mounted on the front casing plate R, secured to the front wall of the casing over

the front opening therein, and the lower end of said front plate R, is provided with a door inclosed opening S, which communicates with the interior of the ash pit.

Now by the construction just described, it will be apparent that it is impossible for smoke, gases and other products of combustion to escape from the fire box into the hot air space H, and in this hot air space H, are arranged parallel channel or partition plates T. The parallel channel or partition plates T, are arranged in parallel horizontal planes one above the other between the bottom cold air opening of the casing and the top thereof, so as to form separate intermediate hot air channels U, which provide a tortuous passage for the air in its circuit around the fire-box. The said channel or partition plates T consist of rectangular strips or plates of metal the edges of which fit close up to the inner walls of the casing and the outside of the fire box G, and said strips or plates of metal are adapted to have one end thereof terminate short of one wall of the outer casing to form air passages V, which communicate or connect the separate channels U—and these passages V, are arranged out of alignment in order to insure the circuitous or tortuous passages of the air, whereby the same will be thoroughly heated before passing out through the hot air pipes I.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

In a hot air furnace, the combination of the inclosing casing having a front vertical opening and a bottom cold air opening at one side, a smaller raised ashpit wall arranged within the casing and provided with an upper shouldered edge, a jointless single-casting dome-shaped fire box arranged within the casing out of contact with its walls and resting at its lower edge on the upper shouldered edge of the ashpit wall, said fire box being provided at one side with an integral projected rectangular end flange registering in the vertical front opening of the casing and having an inclined coal chute therein, the grate supported to slide on the upper edge of the ashpit wall within the fire-box, and a series of parallel channel or partition plates arranged in parallel horizontal planes one above the other within the casing and snugly fitting the exterior of the fire box, said plates consisting of continuous rectangular plates of metal extended at one end up to one side of the projected end flange of the fire-box and having their other ends terminating short of the front wall of the casing to form air passages, said air passages being out of alignment, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE T. FINLEY.

Witnesses:
ROBERT B. CAMPBELL,
D. A. HUNTER.