(No Model.)

# C. WHITE.

## HOT AIR FURNACE.

No. 340,844. Patented Apr. 27, 1886.

FIG. 1.

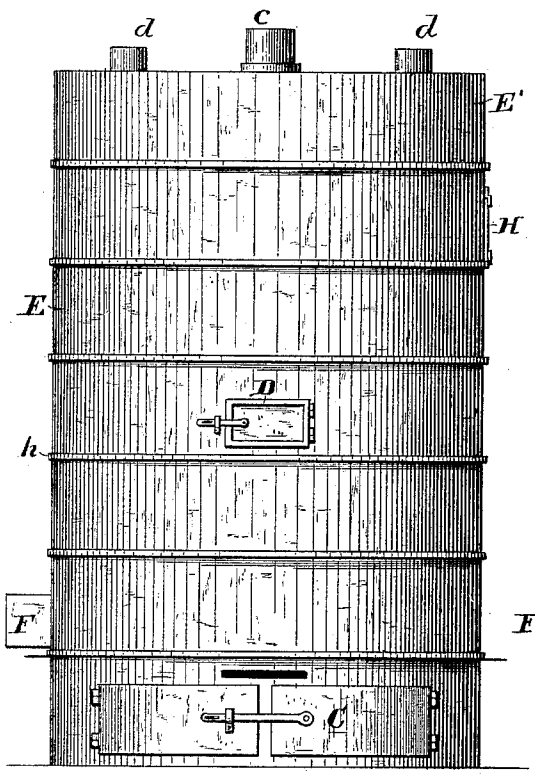



FIG. 2.

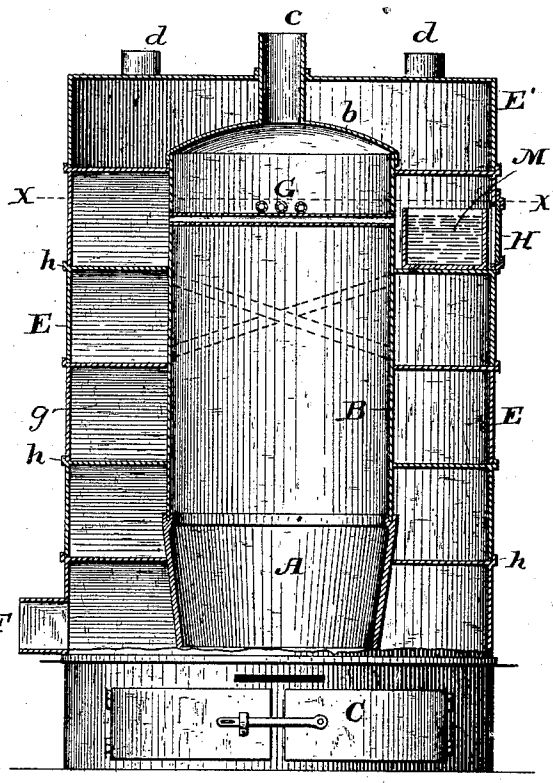



FIG. 3.

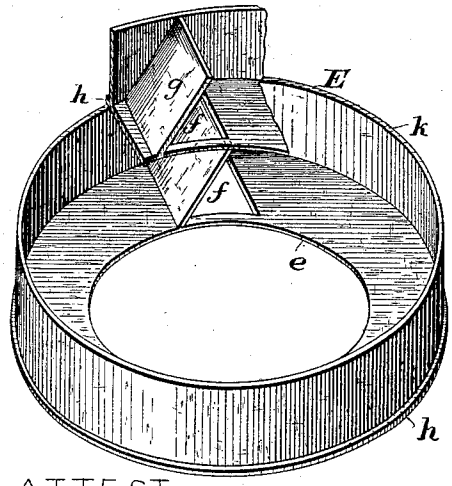
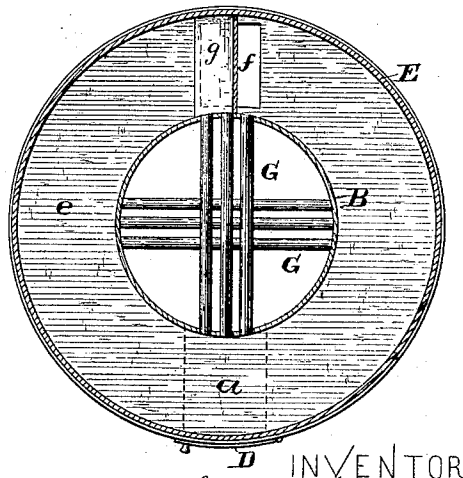



FIG. 4.




ATTEST.
J. Henry Kaiser.
Harry L. Amer.

INVENTOR.
Charles White.
By W. A. Redmond, Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

# UNITED STATES PATENT OFFICE.

CHARLES WHITE, OF WASHINGTON, DISTRICT OF COLUMBIA.

## HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 340,644, dated April 27, 1886.

Application filed December 5, 1885. Serial No. 184,817. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES WHITE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of furnaces by which air is heated for the purpose of warming houses and other buildings, and it has for its object to provide a simple device of few parts, and therefore not liable to get out of repair, and comparatively inexpensive, whereby fuel is economized and the air thoroughly heated; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my improved furnace; Fig. 2, a transverse sectional view; Fig. 3, a perspective view from the under side of the sections, showing the method of building the casing and air-chambers of the furnace; and Fig. 4, a transverse section on the line *x* X, Fig. 2.

Similar letters refer to similar parts throughout the several views.

A represents the furnace or fire-box; B, the drum thereof; C, the doors of the ash-pit, and D the door through which the fuel is fed into the fire-box, a chute being provided for the same from the casing to an opening in the side of the drum B, as indicated in dotted lines at *a*, Fig. 4. The top of this drum is covered by a dome, *b*, provided with a pipe, *c*, for the escape of the volatile products of combustion. This dome *b* fits over the top of the drum B, and is there secured by bolts or rivets so that the gases from the furnace cannot escape into the air-chambers and mix with the air therein.

E represents the iron sections forming the casing and air-chambers. These sections each comprise an annular vertical rim, K, an inwardly-extending flange, *e*, and an outwardly and upwardly projecting flange or shoulder, *h*, all cast in one piece. The flanges *e* extend inwardly to the drum and fire-box, and form a close connection therewith, any suitable material being used as a packing or filling to insure a practically air-tight joint between the parts named. The flange *h* is cast on the upper outside or external edge of each section and extends slightly outward and upward so as to receive the bottom edge of the section next above, sand or other suitable material being filled in around the joints thus formed to prevent the escape of the air at these points.

The flanges *e* have square or other shaped openings *f* for the purpose of permitting the passage of the air from one chamber to another, and to one side of said openings is suitably secured the deflecting-plates *g*. These deflecting-plates are inclined, springing from one edge of the opening to the opposite edge of the opening next above, and so on throughout the entire series to the top where the section E, provided with openings for the pipe *c* and air-pipes *d*, is fitted to the flange *h* of the top section, E. The object of the deflecting-plates is to compel the air upon its entrance to any one of the air-chambers to circulate once around said chamber and then guide it through the opening in the flange of the section next above, said opening being located immediately above the deflecting-plates, which throws them backward about one-half their diameter over the opening next below.

F is the cold air-pipe. This pipe is provided with any suitable damper or valve to regulate the admission of the cold air to the bottom chamber.

Across the drum B, near its top, I provide six tubes, G, more or less. These tubes cross each other and open at both their ends in the same chamber, thus further heating the air which has passed through all the chambers just prior to its exit. These tubes may be horizontal, as shown in full lines, or they may be inclined, as shown in dotted lines, or I may use both the inclined and horizontal tubes, if found desirable.

A damper-door, H, slides in ways made therefor on the side of the casing. This door answers the double purpose of regulating the admission of cold air to reduce the temperature of the heated air prior to its exit by the outlet-tubes *d* and also furnishes an opening for the reception of a pan, M, containing water for the purpose of moistening the heated air. This door is located near the upper part of the casing, so that the air will not become dry again before its exit.

In constructing the air-chambers I take one

of the annular sections (shown in Fig. 3,) and slip it over drum and fire-box down to a flange on the upper edge of the ash-pit, where I secure it, the flange *e* being upward. I then place another section over the drum and fire-box until its lower edge rests in the flange *h* of the section below, properly packing the joints thus formed, and so on until the casing is completed, being careful to so place each section that the lower edge of the deflecting-plate in the section above comes immediately over and in contact with the opposite edge of the opening in the section below, so that said deflecting-plate is directly over part of the opening in the section below, thus gradually moving the openings farther away from the cold-air pipe F, and giving the air-current a spiral movement in its ascent.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A hot-air furnace comprising the following parts: a fire-box, a drum, a dome for covering said drum, the cross-tubes, the outlet-pipe *c*, the casing E, formed of annular rims K, inwardly-extended flanges *e*, having the openings *f*, deflecting-plates *g*, and annular flanges *h*, the top-section, E, having outlet-pipes *d*, cold-air pipe F, and door H, all substantially as and for the purpose described.

2. The combination, with a hot-air furnace, of the annular rim-sections, provided with the horizontal flange *e*, having the openings *f*, the inclined deflecting-plates *g*, and flanges *h*, the lower of said sections being provided with an air-inlet and the upper with air-outlets, with the drum B, and cross-tubes G, said tubes all opening in one air-chamber, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. WHITE.

Witnesses:
ROBINSON WHITE,
HARRY J. DALY.