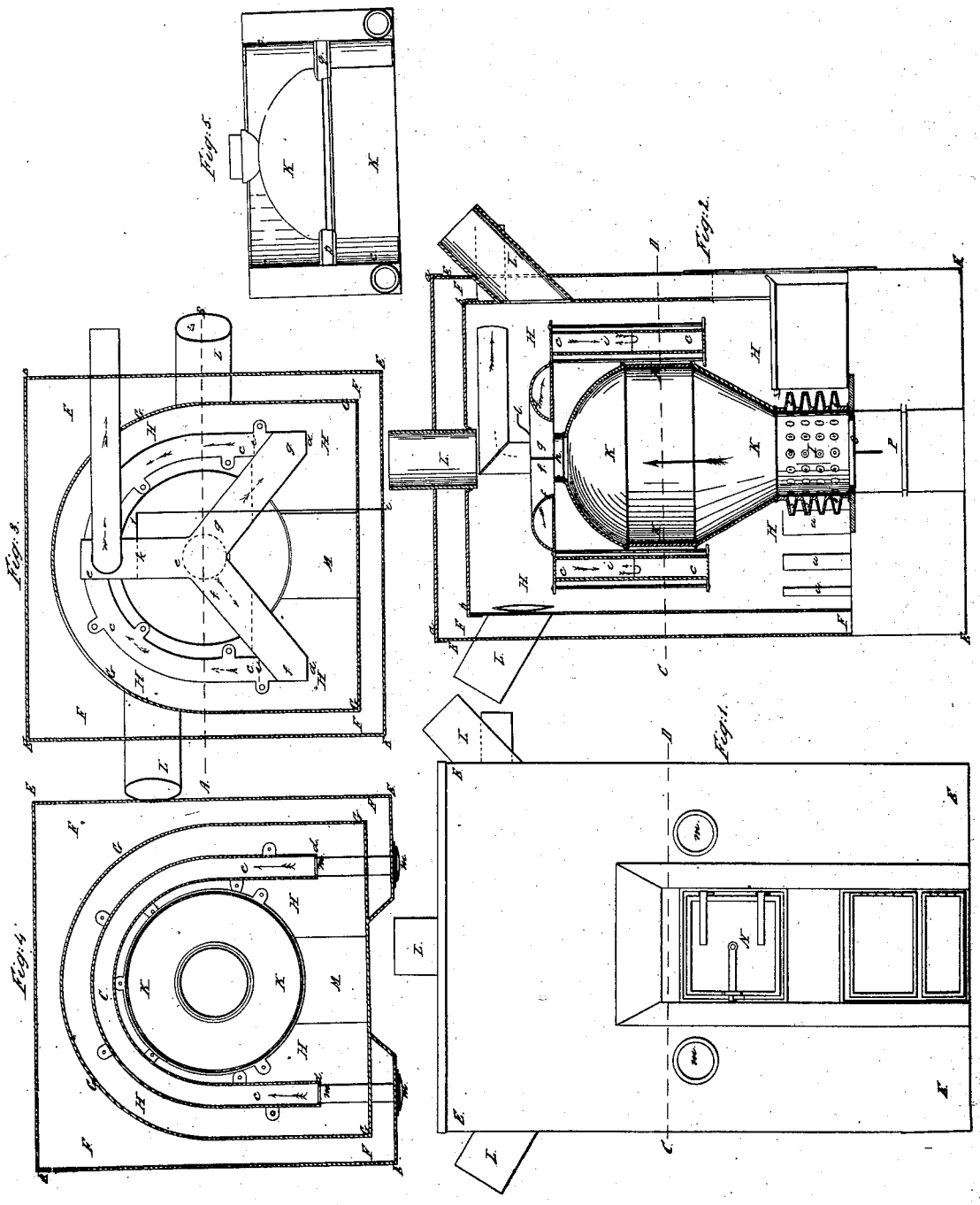
W. Bryant.

Hot Air Furnace.

No. 5,309. Patented Sept. 25, 1847.



UNITED STATES PATENT OFFICE.

WALTER BRYENT, OF BOSTON, MASSACHUSETTS.

HOT-AIR FURNACE.

Specification of Letters Patent No. 5,309, dated September 25, 1847.

To all whom it may concern:

Be it known that I, WALTER BRYENT, of Boston, in the county of Suffolk, and State of Massachusetts, have invented new and useful Improvements in Hot-Air Furnaces, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from others of a similar class, together with such parts or combinations as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements in connection with a furnace now in common use in this vicinity.

Figure 1, is a front elevation. Fig. 2, is a vertical section taken in the plane of the line A, B, Fig. 3. Fig. 3, is a plan with the two plates *a a b b* Fig. 2, removed. Fig. 4, is a horizontal section taken in the plane of the line C D Figs. 1 and 2; and Fig. 5 is a detail view, representing a modification of one portion of my improvements.

E E E, &c., Figs. 1, 2, 3, 4, is the exterior wall or casing of the furnace, constructed in the usual way with proper openings for the introduction of the external atmosphere to the cold air-chamber F F F, Figs. 2, 3 and 4, which chamber is comprehended between said wall E E, &c., and the partition G G G G. Near the bottom of the last named partition, suitable rectangular openings *u*, *u*, *u*, Fig. 2, are formed, through which the cold air is received to the hot air chamber or space H H H, &c., about the fire-pot I, and smoke drum K K.

L, L, L, are the hot air pipes for conducting the heated air to the various apartments of the building.

M is the throat of the fire-pot and N Fig. 1, the door of the same through which the fuel is introduced.

O is the grate of the fire pot, which is of the kind usually known by the name of the "pendulum grate," and P is the ash-pit.

The several parts above enumerated together with their usual appendages, which are represented in the drawings, are constructed mainly in a manner, now commonly known to mechanics versed in such matters, and need not therefore be more particularly described.

My first improvement is however in the fire-pot, and it consists in combining or casting on the external surface of the same, additional material in such shapes or forms as to radiate or conduct off, with the most facility the heat from the sides or periphery of the fire pot and in such a manner as to effectually prevent the cracking or breaking of the same when a large quantity of fuel is in perfect combustion therein. This increased and more rapid radiation, it should be observed, will also greatly assist in heating the air in the hot air chamber designed for distribution. This additional material is embodied in radial arms *s s s s*, &c., extending out as far as is practicable into the hot air chamber H H H, and studding the external surface of the fire-pot as thickly as possible. They may be shaped as shown in Fig. 2, that is, as frusta of elongated cones, or in any other form, so that they shall accomplish substantially the same result of preventing breakage to the fire-pot and greatly enhance, in a manner, peculiar to this device of radial arms, the heating of the air that comes in contact with these parts.

My second and more important improvement, consists in inserting in the hot air chamber a peculiarly constructed hollow radiator *c c c*, Figs. 2, 3, 4, and combining the same with the smoke drum K K, so that the smoke and other heated products of combustion from the fire pot, shall circulate through the said radiator before being discharged to the chimney and thereby materially assist in the process of forming hot air. This radiator is made hollow as shown in Figs. 2 and 4, the sides being bent into the shape of a segment of an ellipse, or so as to be nearly concentric with the periphery of the smoke drum K K, and the top, bottom and front ends *d d*, Fig. 3, being closed with plates secured to the sides aforesaid in any suitable manner. On the top of this radiator *c c c* are the three smoke pipes *e e*— *f f*— *g g*, all of which branch from the short vertical pipe *h* which sets into or over the neck on the top of the smoke drum K K. The pipe *e e* communicates with the interior of the radiator at the center of the back of the same, while the pipes *f f*, and *g g* open into said radiator at its front ends as shown in Fig. 3, and near each of said ends there is a partition *i i*, Figs. 2 and 3, extending to about one-half the depth of the radiator, in

order to cause the smoke, &c., to circulate throughout the space inclosed within said radiator. There is a turning valve or damper *k* in the pipe *e e* as shown by dotted lines in Fig. 3, which is operated by the arm *l l* extending out to the front of the furnace, and when this damper is closed the smoke, &c., passes from the smoke drum K K through the pipes *f f*—*g g* and radiator *c c c*, as shown by arrows in Figs. 3 and 4.

This radiator like all others as is well known will become foul and clogged by soot, &c., from time to time, and in order to clear it out, there are two pipes *m m*, *m m* with closed fronts which communicate with the radiator at the bottom of the front ends of the same, as shown in Figs. 2 and 4. These pipes are inserted from the front of the furnace on each side of the same as shown in Figs. 1 and 4, and when they are removed a brush on the end of a wire may be passed into and throughout the radiator and clean out the soot, &c., with great facility.

Fig. 5 exhibits a slight modification of the mode of communicating between the smoke drum K K and the radiator, *c c c*, there being but two wide rectangular pipes *p*, *q*, which are situated as shown in Fig. 5 and communicate from about the center of the drum to the center of the sides of the radiator, and being so arranged they serve to circulate the smoke, &c., effectually throughout the radiator.

The peculiar shape of my radiator, with a provision for clearing it out, (which has for a long time been a desideratum and never before secured), constitute the distinguishing characteristics of this portion of my improvements.

Having thus described my improvements I shall state my claim as follows:

What I claim as my invention and desire to have secured to me by Letters Patent is—

The radiator *c c c*, constructed for the circulation of the smoke, &c., throughout its interior and arranged for the removal of soot, &c., from the same substantially as herein above described, and also the combination of such a radiator with the smoke drum of the furnace substantially as above set forth.

In testimony that the foregoing is a true description of my said invention and improvements I have hereto set my signature this eighth day of March, A. D. 1847.

WALTER BRYENT.

Witnesses:
EZRA LINCOLN, Jr.,
HENRY BACON.