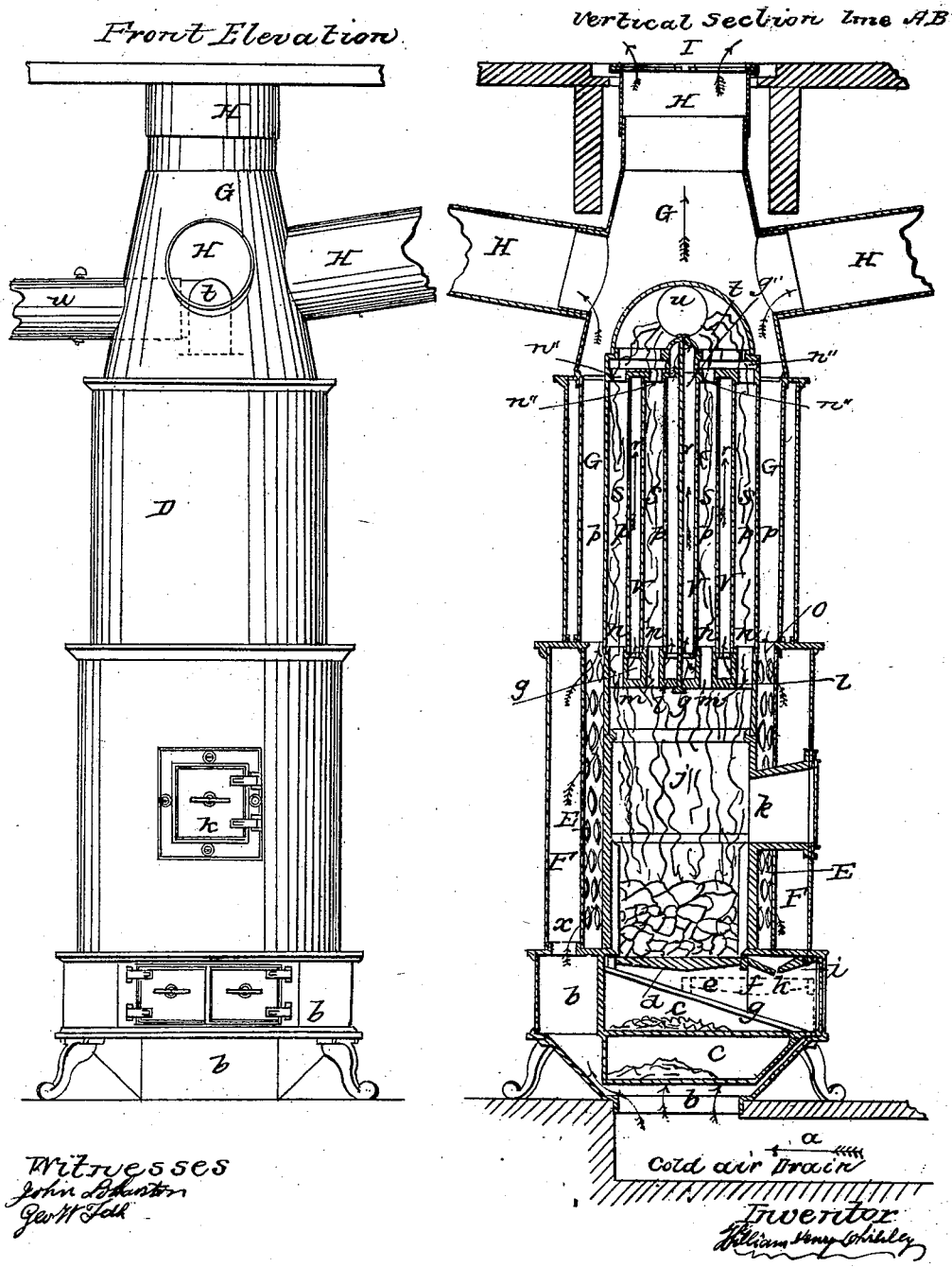
W. H. WHITELEY.

2 Sheets—Sheet 1.

Hot Air Furnace.

No. 2,085.

Patented May 11, 1841.



2 Sheets—Sheet 2.

W. H. WHITELEY.

Hot Air Furnace.

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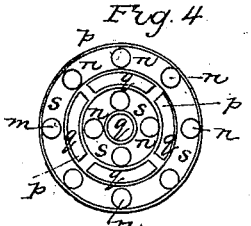
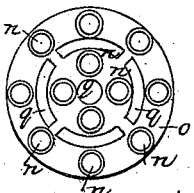
Fig. 4



Plan of top side of cap o



Plan of under side of Cap o

Fig. 8

Plan of air box & Cylinder

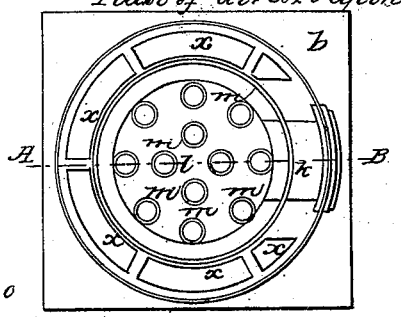
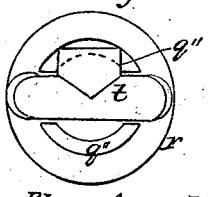
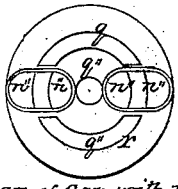


Fig. 1



Plan of cap r pipe t

Fig. 3



Plan of Cap with pipe t 3 pieces removed

Fig. 10

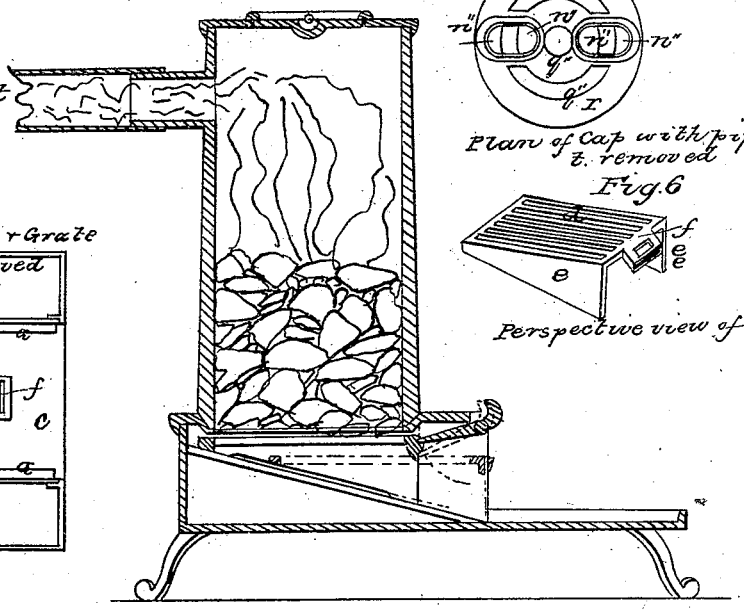


Fig. 2

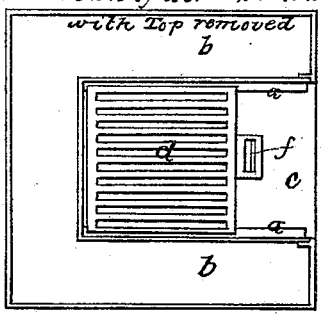
Plan of Cap with pipe t removed

Fig. 6

Perspective view of Grate

Fig. 7

Plan of air Box r Grate with Top removed



Witnesses

William Farrie

John P. Marston

Inventor

William & Henry Whiteley

UNITED STATES PATENT OFFICE.

WM. H. WHITELEY, OF CHARLESTOWN, MASSACHUSETTS.

HOT-AIR FURNACE AND FIRE-GRATE FOR HEATING APARTMENTS, &c.

Specification of Letters Patent No. 2,085, dated May 11, 1841.

To all whom it may concern:

Be it known that I, WILLIAM HENRY WHITELEY, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Hot-Air Furnaces and Fire-Grates, called "William Henry Whiteley's Patent Hot-Air Furnace and Fire-Grate," of which the following is a full and exact description thereof.

Nature of my improvement.—The nature of my improvement consists in constructing in a cheap and durable manner, large heating surfaces and applying the same to hot air furnaces, and the constructing the fire grate in such a manner that it can at all times be entirely withdrawn from under the fuel—the ignited or dead fuel being scraped off the fire grate—by the action of withdrawing it thus preserving the fire grate for a much longer period than is usual where facilities of cleansing the same are not so perfect.

The construction.—Reference being had to the drawings which are annexed and form part of this specification the same letters being fixed to corresponding parts in all the drawings and figures—

a, Figure 9, No. 1, represents the cold air drain for admitting the external air, *b*, the cold air box having an opening in the bottom connecting it with the drain *a*, *c* the ash pit which is placed in the air box *b* and is made tight so that the ashes shall not get into the air box *b*, it stands a sufficient distance from the bottom of the air box *b* to allow of the free passage of the cold air from the cold air drain *a* into the air box *b*, *d* the fire grate made different from usual inasmuch that it has two beveled or angle cheeks *e*, one on each side and a handle *f*—the fire grate —*d*— rests and slides upon the guides —*g*— that are secured to the sides of the ash pit *c*, *h* is the catch or scraper turning upon a center at —*i*— and resting against the handle *f* when the fire grate *d* is in its proper position, that part of the catch or scraper *h* which rests upon or against the fire grate *d*, is nearly of the same width as the fire grate *d*.

J is the cylinder or fuel chamber—*k* the orifice for putting in the fuel—*l* the cylinder top having twelve nozzles or tubes (*m*) projecting a few inches upward.

O, is a circular cap having twelve holes (*n*) on the underside to correspond and fit the nozzles or tubes (*m*) and on the topside four projecting rings to fit the four cylinders *p*, placed concentric to each other—the cap O has likewise five openings *q*—(*r*) is another circular cap with four projecting rings on its underside to fit the cylinders *p* and three openings marked *q''* and four openings *n''*—thus forming four cylindrical chambers concentric with each other, the ones marked S being the fire chambers from their communicating with the chamber containing the ignited fuel by means of the nozzles or tubes *m* and holes *n* and the smoke or gas escaping by the four apertures, *n''*, into the branch pipe (*t*) which pipe has a neck for the smoke pipe *u*. The air is admitted into the heating chambers V by the openings *q* and escapes into the hot air chamber G by the three openings *q''*. The formation of the caps O and *r* and the cylinder top (*l*) is more distinctly shown in Figs. 1, 2, 3, 4, 5, 8 No. 1 and the construction of the fire grate in Figs. 6, 7, No. 1.

The other parts of the furnace are so like the general construction of such articles that I shall refer to the drawings annexed—and which form part of this specification. D is the outer case. E the perforated case. F the cold air chamber. G the hot air chamber. H the hot air conductors. I the register.

Fig. 10, No. 2, shows the adoption of the fire grate —*d*— to the common cylinder stove of the kind in general use.

I have not stated the materials employed as either wrought or cast iron or copper can be used to suit the fashion or trade of the place for which they may be manufactured.

Operation.—I will now describe the operation of the hot air furnace and fire grate. The cold air to be warmed is admitted by the cold air drain *a* into the air box *b*, from which it passes upward in the direction of the arrows through the apertures X into the cold air chamber F from whence it rushes through the apertures in the perforated case E upon the heated cylinder *j*, part of it passing upward (and acting upon the exterior of the outer fire chamber S passes into the hot air chamber G the other portion passes over the cylinder top, *l*, around the nozzles or tubes (*m*) thence through the apertures *q* into the heating chambers V and escapes into the hot air chamber by the

apertures or openings q''—it then passes into the apartments to be warmed by the conductors H and is regulated by the registers—one of which is shown at I, the operation of the fire grate d is as follows: Supposing the furnace to have been in use and that the fire having died out it is desired to relight it—the catch h, is raised so as to clear the handle f—the fire grate d being now free is drawn out descending from the bottom of cylinder (j) as it is withdrawn thereby allowing it to clear itself and letting the dead fuel fall into the ash pit (c). Whatever remains upon the fire grate (d) is scraped off by the catch or scraper (h) which descends and rests upon the fire grate (d) as it is being withdrawn. The fire grate (d) can then be cleared of any clinkers that may have adhered between the bars and it is then slipped into its place sliding upward upon the guides (g), as it is being pushed into its place. The catch or scraper (h) then falls into its place upon the handle (f) and retains it there. The catch or scraper (h) thus performs a twofold office, namely holding the fire grate (d) in its proper position and scraping off the coal or ashes as it is being withdrawn from the ash pit (c), thus in combination with the fire grate's (d) wedge-like form and movement rendering it impossible for it to be jammed or obstructed in withdrawing it.

When a new fire grate is required the old one is taken out and replaced by a new one of the same size without disturbing any other part of the furnace.

What I claim and desire to have secured by Letters Patent of the United States is—

1. The improvements in hot air furnaces and fire grates the said improvements consist in the mode in which I have combined the concentric cylinders p with the cylinder or fuel chamber J and the cases D and E, by arranging them over the fuel chamber and within the said cases so that the spaces between them shall form alternately air heaters and flues for conducting off the smoke and gases as hereinbefore described.

2. And the construction of the fire grate (d) on the principle of a wedge (either by means of the cheeks (e) or making the whole fire grate in that form) in combination with the double action of the catch or scraper (h).

3. Not limiting myself to any specific number of concentric cylinders nor to any particular angle or bevel in the fire grate but adapting both the number of the cylinders and the angle of the grate to the size and position of the furnace, neither do I confine myself to the application of the improved fire grate to hot air furnaces alone but I claim the use of the improvement whether applied to furnaces stoves or open grates.

In testimony whereof I, the said William Henry Whiteley, have hereunto subscribed my name this twenty first day of April 1841.

WILLIAM HENRY WHITELEY.

Witnesses:
John P. Marston,
William Farrie.