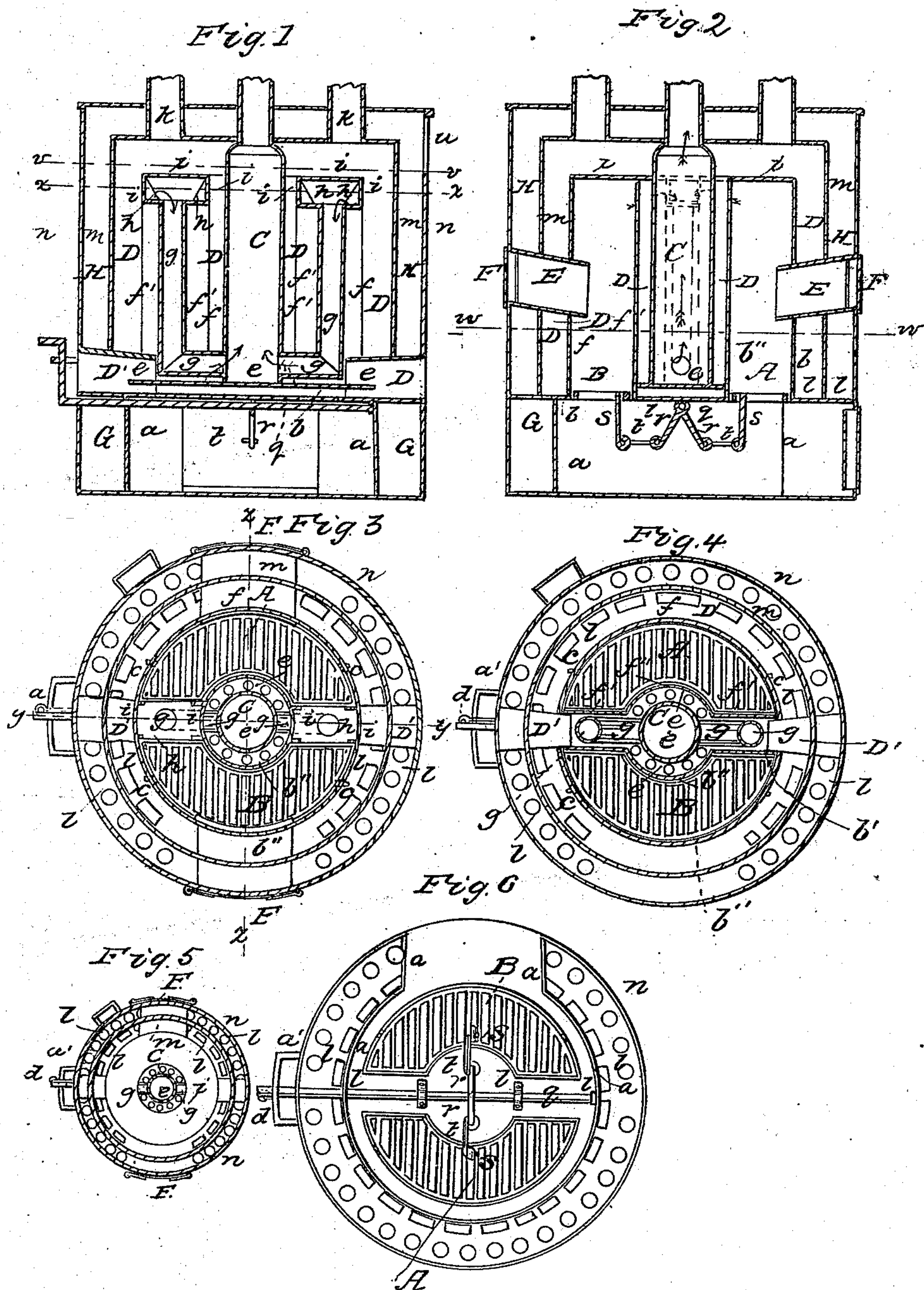


J. H. SUTTON.  
Hot Air Furnace.

No. 12,533.

Patented March 13, 1855.





# UNITED STATES PATENT OFFICE.

JAMES H. SUTTON, OF HONESDALE, PENNSYLVANIA.

## AIR-HEATING FURNACE.

Specification of Letters Patent No. 12,533, dated March 13, 1855.

*To all whom it may concern:*

Be it known that I, JAMES H. SUTTON, of Honesdale, in the county of Wayne and State of Pennsylvania, have invented a new and useful Improvement in Air-Heating Furnaces; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, Figure 1 being a vertical section in the line *y y* of Fig. 3; Fig. 2, a vertical section in the line *z z* of Fig. 3; Fig. 3, a horizontal section in the line *x x* of Fig. 1; Fig. 4, a horizontal section in the line *w w* of Fig. 2; Fig. 5, a horizontal section (drawn on a smaller scale) in the line *v v* of Fig. 1; and Fig. 6 is a plan of the under side of the furnace.

Similar letters indicate like parts in all the figures.

My improved air heating furnace has two separate and distinct fire chambers A, B, combined with the hot air chamber D, and with the central smoke pipe C, substantially as represented in the drawings and hereinafter set forth.

The outer cylinder *n*, incloses all of the other parts of the furnace. The short cylinder *a*, supports the plate *l*, and all the interior portions of the furnace. The plate *l*, occupies the entire space within the outer cylinder *n*, with the exception of the openings for the grates of the furnaces A, B, and the air apertures represented in the drawings. The space within the short cylinder *a*, forms the ash pit to both furnaces.

The grates of the respective furnaces A, and B, are of the shape represented in the drawings; the said grates rest upon pivots *c, c*, and are combined with the crank shaft *q*, by means of the levers *r, r*, and *s, s*, and the links *t, t*, as represented in Figs. 2 and 6. The crank shaft *q*, is placed in suitable bearings below the plate *l*, and the crank at its outer end is received into the guard *a'*, on the outer side of the outer casing *n*. The pin *d*, which passes through the said guard, serves to retain the grates in their proper position. When it is desired to shake the grates, the pin *d*, is withdrawn, and the crank on the end of the shaft *q*, is worked back and forth, which causes the grates to vibrate on their pivots. The links *t, t*, which connect the levers *r, r*, that descend from the shaft *q*, to the levers *s, s*, that descend from the grates, are securely hinged to the

former, but are connected to the latter in such a manner (shown in Fig. 6) that they can be readily detached, whenever it may be necessary to turn the grates up sidewise to discharge their contents into the ash pit. The sides of the fire chamber A are indicated by *f, f', f', f''*, and the sides of the fire chamber B are indicated by *b, b', b', b''*. The tops of the portions *f', f'*, of the furnace A, are united to the positions *b', b'*, of the furnace B, by the radial pieces *h, h*, and segments *i' i' i' i'*—shown in Figs. 1 and 3;—and both furnaces are covered by the annular plate *i*, which accurately and tightly fits to the sides of the furnaces and to their conducting pieces *i', i'*. The annular plate *i*, is a sufficient distance above the radial connecting plates *h, h*, to allow the gaseous products of combustion to pass freely from both furnaces into the smoke pipes *g, g*, which descend from perforations in the said radial plates *h, h*, as shown in Fig. 3. The said descending smoke pipes *g, g*, are connected at their lower ends to the central ascending smoke pipe C, as shown in Fig. 1. The bottom of the main smoke pipe C, is closed by the plate *e*, represented in Figs. 1, 2, and 3. The hot air chamber D, is inclosed by the casing *m*, and it will be perceived that the air in said chamber has free access to all sides of both furnaces, and likewise to all sides of the ascending smoke pipe C, and the descending smoke pipes *g, g*; thereby forming a great amount of heating surface. It will also be perceived, that either of the furnaces, can be used without the other, and that a single furnace will heat the air efficiently in the air chamber; which enables either of the furnaces to be cleaned out and replenished with fresh coal, without disturbing the other; and when the weather is not too severe, only one furnace need be used. Air is admitted to the hot air chamber D, through the conductors *D', D'*, which discharge a portion of their contents under the plate *e*, and the remainder against and below the angles of the smoke pipes *g, g*. The air which enters under the plate *e*, passes up through the apertures therein which open into the space between the central smoke pipe C, and the inner portions *f'', and b''*, of the two furnaces; and the air which enters from the said conductors *D', D'*, above the said plate *e*, passes up around the descending smoke pipes *g, g*, in the space between the sides *f', f'*, and *b', b'*,



of the two furnaces. Air is also admitted through suitable openings *u*, in the outer casing *n*, and descending in the space *H*, between said casing and the casing *m*, passes  
5 through the series of apertures in the plate *l*, into the upper portion of the water chamber *G*, and thence passes up through another series of apertures in the plate *l*, into the air heating chamber *D*. The hot air  
10 may be conducted from the hot air chamber through any suitable number of eduction pipes *k*, *k*.

Fuel is put into the furnaces through the inclined passages *E*, *E*, which are covered  
15 by the doors *F*, *F*.

What I claim as my invention and desire to secure by Letters Patent, is—

The arrangement of the furnaces *A*, *B*, the descending smoke pipes *g*, *g*, and the central smoke pipe *C*, with each other and 20 with the single air heating chamber *D*, substantially in the manner and for the purpose herein set forth.

The above specification of my new and improved air heating furnace signed and 25 witnessed this 25th day of January 1855.

JAMES H. SUTTON.

Witnesses:

CHARLES S. MINOR,  
ABEL BARKER.