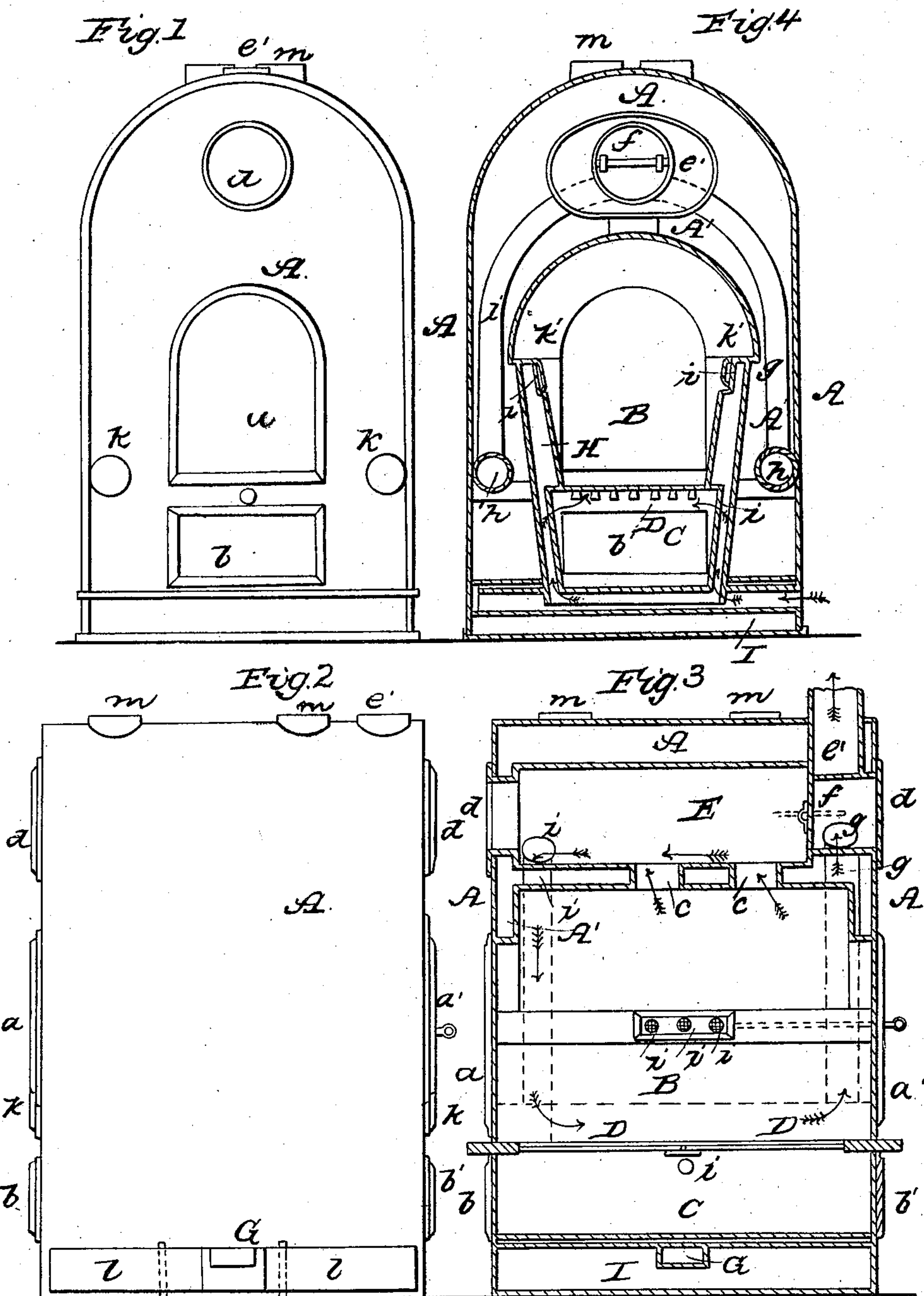


G. W. WILSON.

Heating Furnace.

No. 46,601.

Patented Feb. 28, 1865.



Witnesses
J. W. Hale Jr.
J. A. Brooks

George W. Wilson
by his attorney
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UNITED STATES PATENT OFFICE.

GEORGE W. WILSON, OF CHELSEA, MASSACHUSETTS.

AIR-HEATING FURNACE.

Specification forming part of Letters Patent No. 46,601, dated February 28, 1865.

To all whom it may concern:

Be it known that I, GEORGE W. WILSON, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented an Improved Air-Heating Furnace for Warming Buildings; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a front end elevation, Fig. 2, a side elevation, Fig. 3 a longitudinal section, and Fig. 4 a transverse section, of it.

In the said drawings, A denotes the outer case of the furnace, within which there extends from end to end of it a fire-place, B, and an ash pit or chamber, C, the fire-place being arranged over the ash-chamber, and each being provided with a door at each of its ends, such doors being shown at *a a' b b'*. Within the opening between the fire place or chamber and the ash-pit there are two rotary grates, D D', one of which is placed directly in rear of the other. Each of these grates should be capable of being turned or tipped independently of the other in such manner as to discharge into the ash-pit any waste coal or ashes that may be on such grate so turned.

Directly above the fire-place, and within the air-chamber A' of the case A, there is a long radiator or chamber, E, which connects with the furnace by one or more vertical flues *c c*, and extends from one end to the other of the case. It opens out of either or both of the ends, and has a cover, *d*, to the openings.

A smoke pipe or flue, *e'*, leads out of the radiator E, and the upper part of the case A, near to one end of the case. A damper, *f*, is placed in the radiator and in rear of the said flue *e*, and a set of flues, *g g*, which lead out of the front part of the radiator and extend down within the air-heating chamber and astraddle of the fire-place and enter at their lower ends two horizontal flues, *h h*. Flues *i i*, similar to the flues *g g*, lead down from the radiator into the two flues *h h*. Each horizontal flue *h* opens at one or each end of it through the case A, the opening being provided with a cover, *k*.

Transversely through the case and in the middle of an air receiving chamber, I, arranged underneath the ash-chamber, there extends an air-flue, G, which is open at one end, and communicates with two verticle flues or pipes,

H H, which lead up alongside of opposite sides of the fire-place and ash-chamber and are provided with air-passages *i' i'*, leading out of them and into both the ash-chamber and fire-place. Those air-passages which open into the fire place are placed at such a height as to discharge air into the flame-space of the fire-chamber—that is, that part of the chamber which is usually above the fuel. Furthermore, the said air-passages last mentioned are provided with slide-valves *k' k'*, by which they may be closed, more or less, as occasion may require. The air-receiving chamber I opens into the air-heating chamber A', and is open at its side, such side opening being provided with two light swing valves or doors *l l*, applied to it so as to open by an intruding current of air and to close under back pressure of the air within the air-heating chamber.

In the operation of this furnace the smoke and waste volatile products of combustion of the fire place or chamber B will pass through the pipes *c c'* and into the radiator E, and provided the damper *f* should be open they will rush directly into the discharge-pipe *e'*. In case the said damper may be closed the said smoke and the waste gases of combustion will pass through the radiator, thence down the flues *i i* and into the horizontal flues *h h*. From the said flues *h h* the smoke and gases will escape by the pipes or flues *g g* and rush into the front part of the radiator, from whence they will escape by the flue *e'*.

In their passage through the fire-place radiator and flues above mentioned, the heat absorbed from the smoke and gases by the surfaces exposed to the air within the air-heating chamber A' will be radiated into such air and serve to warm it. The air so heated may be led by pipes to various apartments to be warmed, such pipes passing out of the top of the case A, as shown at *m m*.

The air-receiving chamber by extending underneath the ash-chamber receives any heat which may be radiated from the bottom thereof, and thus serves to prevent such bottom from becoming burned or destroyed by the hot coals which may fall upon it from the grate.

The double grate or two rotary grates arranged in one fire-place, as described, is very advantageous, as they enable the serviceable coals to be pushed from one grate to and upon

the other before the first grate is revolved for the purpose of discharging ashes and clinkers into the ash-pit. In this way I save the necessity of discharging into the ash-pit the useful coals and subsequently removing them back to place on the grate. The two grates are also useful in other respects.

By reason of the air pipes *G H H*, arranged as described, the supply of oxygen to the fuel and flame may be effected with excellent results. The arrangement of the fire-place, the ash-chamber, the radiator, and the smoke-pipes is very favorable for cleansing them of ashes and soot or extraneous matters.

An air-heating furnace made in manner as above described is a very powerful and economical means of warming a building, it being adapted to the burning of either wood or coal.

What I claim as my invention in the said furnace is as follows, viz:

1. The combination and arrangement of the

fire place *B*, ash-chamber *C*, radiator *E*, descending pipes *i i*, horizontal flues *h h*, ascending pipes *g g*, damper *f*, and escape-flue *e'*, the whole being arranged with respect to the air-heating chamber *A'*, substantially as set forth.

2. The combination of the air-receiving chamber *I* and its vibratory valves *l l* with the air-heating chamber *A'*, and the fire-place provided with flues, substantially as described, for the escape of the volatile products of combustion.

3. The arrangement of the air-ducts *G H H* with the air receiving chamber *I*, the air-heating chamber *A'*, the fire-place *B*, and ash-chamber thereof.

GEO. W. WILSON.

Witnesses:

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