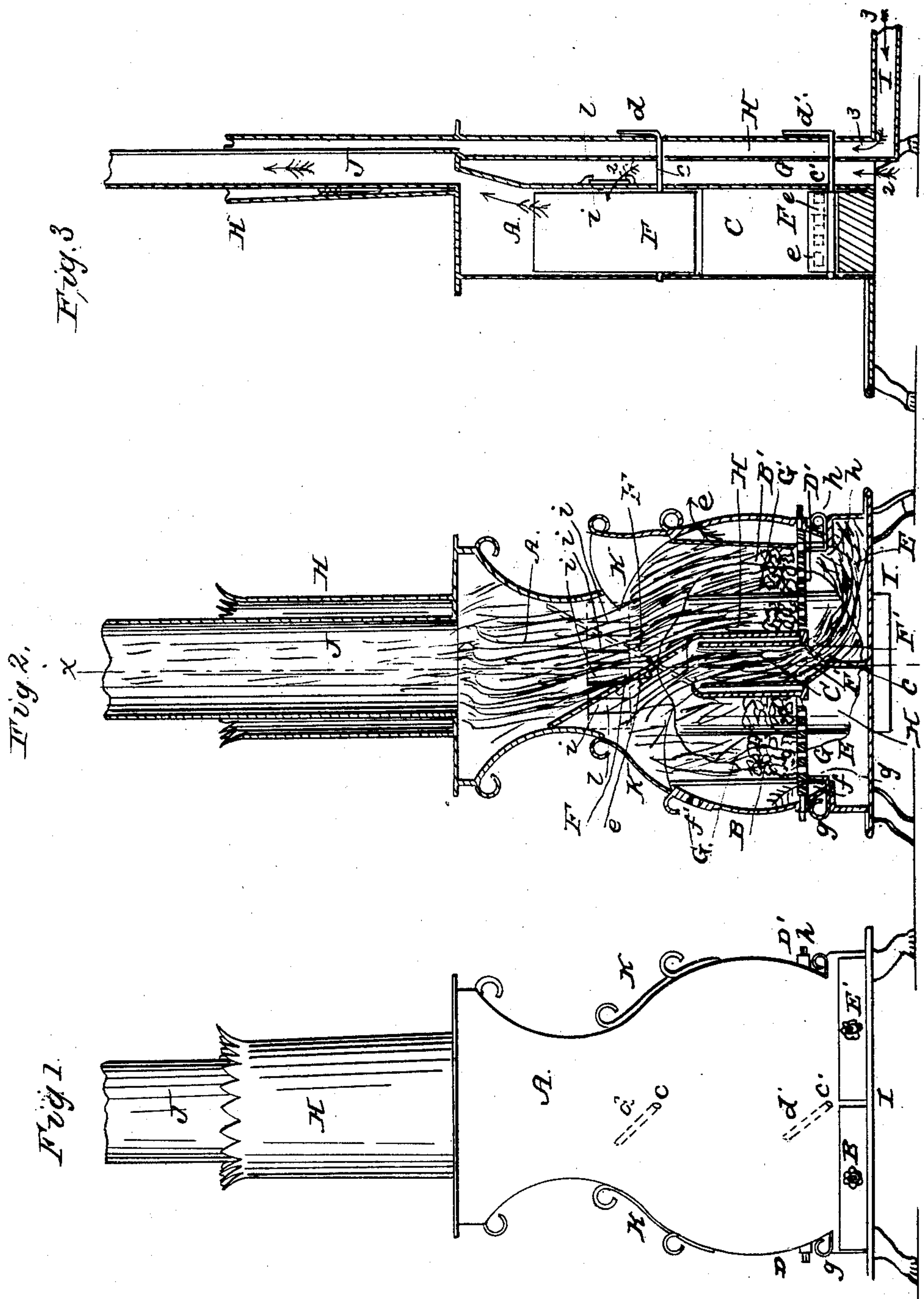


E. A. HILL.
Heating Stove.

No. 11,807.

Patented Oct. 17, 1854.



UNITED STATES PATENT OFFICE.

E. A. HILL, OF JOLIET, ILLINOIS.

SMOKE-CONSUMING STOVE.

Specification of Letters Patent No. 11,807, dated October 17, 1854.

To all whom it may concern:

Be it known that I, E. A. HILL, of Joliet, in the county of Will and State of Illinois, have invented a new and useful Improvement in Smoke-Consuming Stoves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a front elevation of a stove with my improvements. Fig. 2, is a vertical transverse section of the same. A bright lively fire being represented in one of the chambers, and a dull one in the other, and the smoke of the latter being shown passing down under and up through the grate of the former. Fig. 3, is a vertical central section of the same through the line *x, x*, in Fig. 2.

Similar letters of reference in each of the several figures indicate corresponding parts.

Before stating the object and nature of my improvement, I will, so to make it more evident, advert to two of the most utile plans contrived for accomplishing the complete consumption of the smoke or carbonic oxid which rises from the fire when fresh coals are supplied, or while said coals are being completely ignited. The first is that patented by William Lash, of England, in 1815. His arrangement covers a warming apparatus connected with two fire chambers, so arranged and combined, and also supplied with fuel, that the fire in one chamber is always at full blast while the fire in the other is in a dying state, and when fresh coals are supplied to the dying fire, and a damper or other contrivance turned, the carbonic oxid or unconsumed smoke rising from the same is passed over the red hot coals or blaze of the adjacent fire. This arrangement evidently effects the desired object to a certain extent, and but for the supply of oxygen through the bottom of the grate not being sufficient to overcome the deadening effect of the smoke upon the top of the fire, it would be generally adopted. The second is that patented by Ambrose Lord, of England, in December, 1846. This patent covers a furnace, only applicable to steam boilers, provided with two grates arranged and combined, and also supplied with fuel in such a manner that when the fire in one grate is in full blast, the other is in a dying state, and when fresh coals

are supplied to the dying fire and dampers turned, the carbonic oxid or smoke rising from the same, is caused to pass under and up through the red hot coals of the adjacent grate. This arrangement, as must be obvious, completely consumes the smoke without materialy interfering with the burning of the fire. And but for its being complicated and not readily applied to comon stoves, its utility would exceed that of the plan first cited.

The object of my invention is to render smoke consuming parlor or other stoves provided with two fire chambers capable of more effectually consuming the smoke rising from either of the chambers when fresh coals are supplied, or during the time the coals last supplied are becoming perfectly ignited; and also to simplify their construction and operation.

The nature of said improvement consists in conducting the smoke rising from the chamber last supplied with fresh coals through the red hot coals of the adjacent chamber, by providing a suitable draft flue on each side of the stove, and a vertical smoke flue between the chambers and a damper at the top and bottom of said flue for regulating the course of the smoke as it escapes from the fire.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, represents the outer case or large fire chamber of the stove.

B, B', are the two small fire chambers formed in the same.

C, is the smoke passage or space formed between the chambers, B, B'.

D, D', are the grates—they are made capable of being turned from a horizontal to a vertical position, so that the ashes, &c., may be dumped with ease and facility, as will be evident from the drawing.

E, E', are the ash pits; they are partly prevented communicating with each other, by the partition *b*, as shown.

F, is the damper for completely shutting off the communication of the chambers B, B', at their top; and F', is the damper for entirely shutting off the communication of the ash pits with each other, as illustrated in Fig. 2. These dampers are attached to the rods *c, c'*, and are turned by the crank handles *d, d'*, of said rods, from the positions shown in full black lines, to the posi-

tion shown in dotted lines, and vice versa. By employing these dampers, the smoke can always, if desired, be caused to pass down through the passage C, into either of the ash pits, and then up through the grate and live coals of either of the chambers, as will be presently shown in describing the operation of the stove.

G, G', are draft flues, taking the coldest air and carbonic acid gas from the room, and conducting it into the fire chamber B, through *f*, at *g*, or into B', through *e*, at *h*—*e*, and *f*, being branches of the flues G, G'. When the dividing dampers F, F', are in the positions shown in full black lines in Fig. 2, the damper *g*, is opened and *h* is closed; allowing the draft from G, to enter the fire in B, through the branch flue *f*, as indicated by the arrow *l*; but when said dampers are in the positions shown in dotted lines, *h*, is opened and *g*, is closed; the draft from G', then entering the fire in B' through the branch flue *e*. *e'*, and *f'*, are dampers in the upper part of the flues *e*, and *f*, to allow the escape of the hot air, thereby cooling their internal plates when *g*, or *h* are closed.

The upper extremity *i*, *i*, of the flues G, G', Figs. 2 and 3, may be made to communicate directly with the large chamber A by opening the dampers *l*, *l'*; thereby diminishing the force of the draft, and at the same time preventing the smothering of the fire by the smoke. When it is desired to stop the draft entirely to keep the fire all night, the dampers *l*, *l'*, are opened and both *g*, and *h*, are closed; all the draft then entering through *i*, *i*, as indicated by the arrows 2, Fig. 3. H, is a ventilator flue for supplying—without any contingency—pure hot air in the place of that carried out through the flues G, G'; it is connected at its lower end with a horizontal pipe I, which leads out of doors, and supplies cold fresh air to it, as illustrated by the arrows 3.

J, is the chimney flue. K, K, are the doors through which the coal is introduced to the fires—one of the doors is shown open in Fig. 2.

The operation is as follows:—A coal fire is first built in one of the chambers,—B, for instance—and as soon as it burns lively, as illustrated in the drawing, a fire is started in the other chamber B', and as soon as it has sufficient life to insure combustion, the dampers F, F', are made to occupy the positions shown in full black lines in Fig. 2; the damper *g*, is opened, and *h*, closed.

This being done, the smoke will be caused to change its course after reaching the damper F, and pass down through the passage C, into the ash pit E', and then up through the grate D', and red hot coals of the chamber B'. As soon as the smoke comes in contact with the coals in the chamber B', it will ignite and consume. The drawing, Fig. 2, clearly illustrates the principle of my invention, a fire being shown in full blast in one chamber, and a thick volume of smoke rising from the coal in the other chamber, and passing down into the ash pit B', and up through the grate D'. When the fire in B', is spent, and the fire in B, is in full blast, the process, and the position of the dampers are reversed.

This invention, it is thought, can be applied to cooking stoves with equal advantage. Of course such stoves will have to be constructed slightly different from those now in use.

I do not claim the constructing of a furnace for steam boilers with two grates or fire chambers, supplied alternately with fuel, and passing the unconsumed smoke or carbonic oxid of one fire through the red hot coals of an adjacent one; neither do I claim a stove or heating apparatus constructed with two grates or fire chambers, supplied alternately with fuel and passing the unconsumed smoke or carbonic oxid of one fire over the said hot coals or blaze of the other, but

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

1. The combination and arrangement of the smoke passage C, dampers F, F', and draft flues G, *f*, G', *e*, substantially as herein described, for the purpose of conducting the unconsumed smoke or carbonic oxid through completely ignited coals, in a simpler and readier manner than has been done before, as set forth.

2. I do not claim the pipe H, I, for the purpose of ventilating the room, but what I do claim is the combination of the draft flues G, *f*, G', *e* and *i*, *i*, in combination with the pipe H, I, for the purpose of supplying the stove with the necessary quantity of air to insure the complete combustion of the fuel, or for preventing the smoke smothering the fire, substantially as set forth.

E. A. HILL.

Witnesses:

S. O. SIMONDS,
J. P. AVERILL.