

LAFORGE & CRANE.

Heating Stove.

No. 102,558.

Patented May 3, 1870.

Fig. 1.

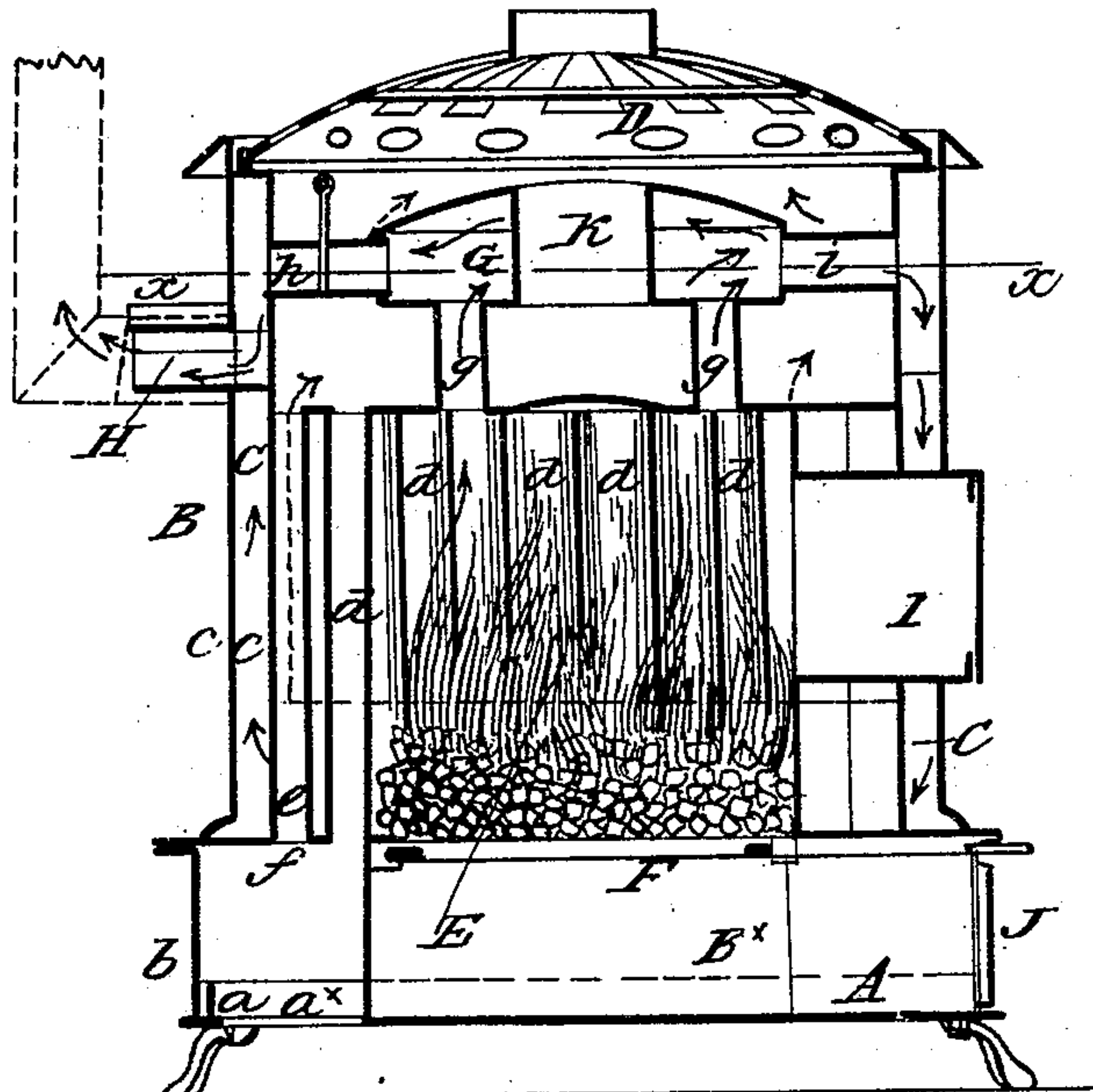
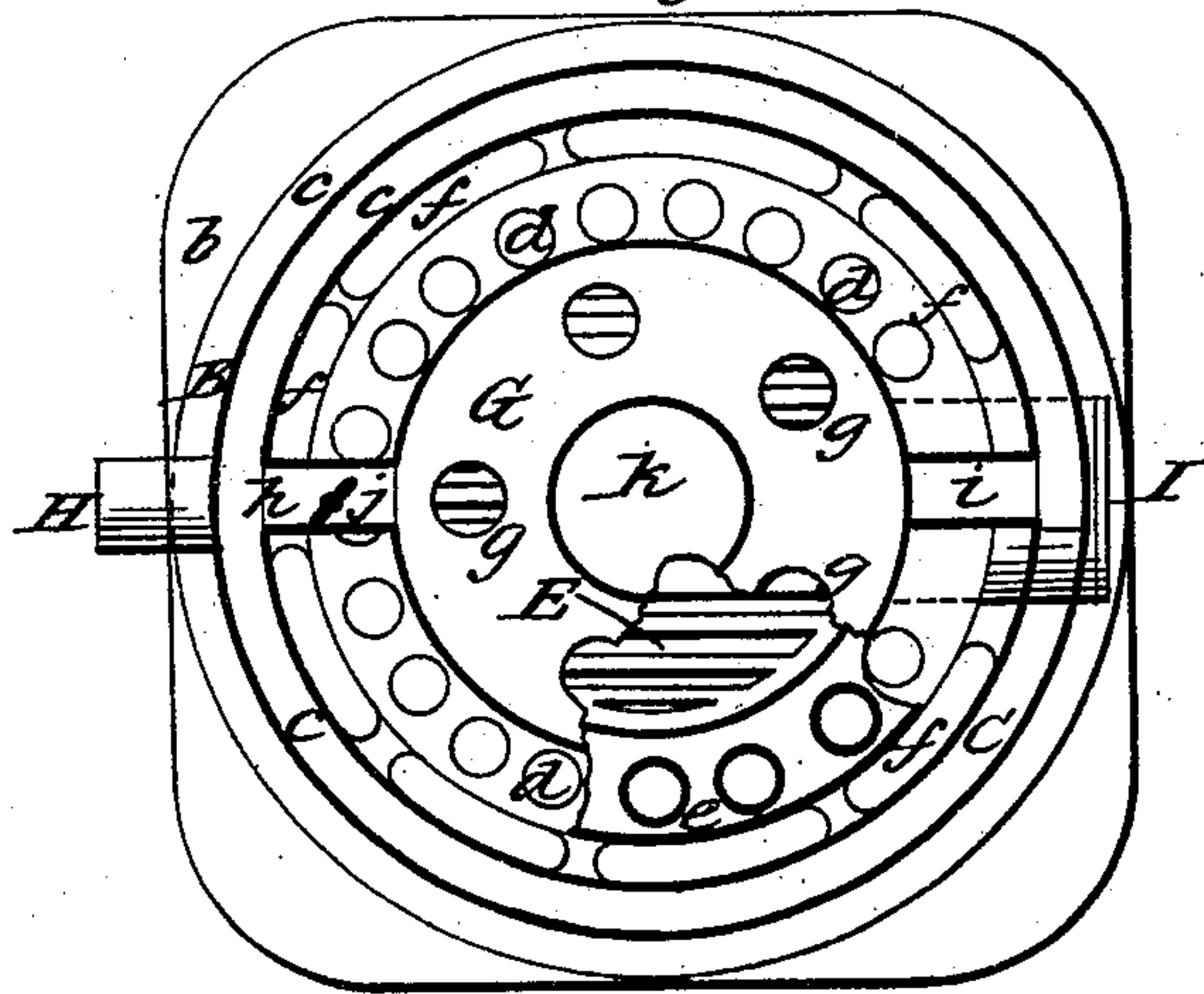


Fig. 2.



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# United States Patent Office.

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Letters Patent No. 102,558, dated May 3, 1870; antedated April 18, 1870.

## COAL-STOVE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, JOEL LAFORGE and JONATHAN T. CRANE, of Rahway, in the county of Union and State of New Jersey, have invented a new and improved Radiating and Air-heating Stove; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon making a part of this specification.

This invention relates to new and improved stove, by which heat is diffused by direct radiation, and also by the emission of heated air, the device being a combined radiating and air-heating stove.

One great difficulty hitherto encountered in constructing a stove of this class has been the rapid burning out of the air-heating pipes, the same being necessarily exposed to a high degree of heat. Another difficulty has been constructing such a stove, or arranging the several parts of the same, in such a manner as to obtain a portable device, or one which will not monopolize much space, and capable of being manufactured at a reasonable cost. These difficulties have, it is believed, been fully overcome by our invention.

In the accompanying sheet of drawings—

Figure 1 represents a vertical central section of our invention.

Figure 2, a horizontal section of the same, taken in the line  $x x$ , fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

To enable those skilled in the art to fully understand and construct our invention, we will proceed to describe it.

A represents the base of the stove, on which is the ash-chamber  $B^*$ . This base is cast with a flange,  $a$ , over which the bottom part  $b$  of the body B of the stove is fitted, (see fig. 1.) The body B may be of cylindrical form—that probably would be the preferable shape—and it is made with two walls,  $c c$ , with a space, C, of requisite width between, which space, under certain conditions, is made to serve as a flue, as will be presently explained. This flue or space C is closed both at top and bottom, but the top of the space within the body B has a perforated or open cover, D, which rests on the top of the walls  $c c$ , as shown in fig. 1.

E is the fire-chamber, provided at its bottom with a grate, F, which may be hung on journals. This fire-chamber is surrounded by a series of vertical tubes,  $d$ , arranged at equal distances apart, and communicating at their lower ends with the base A, the bottom plate of which has openings  $a^*$ , to admit the external air, said openings being at the outer side of the ash-chamber  $B^*$ , (see fig. 1.) The upper ends of the tubes  $d$  communicate with the upper part of the interior of B, and said tubes are encompassed by a case,  $e$ .

Between this case  $e$  and the inner wall  $c$  of the body B, there is a space,  $e^*$ , which extends all around the fire-chamber, and communicates with the hollow base A below by means of openings  $f$ , (see fig. 2.)

In the upper part of the space within the body B, there is placed and secured permanently, an annular chamber, G, which communicates with the fire-chamber E by a series of vertical tubes,  $g$ .

This chamber communicates with the space or flue C by two horizontal pipes,  $h i$ , one of which,  $h$ , enters C just above the smoke-pipe H, the other,  $i$ , enters C at a point directly opposite where  $h$  enters, as shown in fig. 1.

I is the door, through which the fire-chamber is supplied with fuel, and

J is the door by which access is had to the ash-chamber  $B^*$ .

The pipe  $h$  is provided with a damper,  $j$ .

The operation is as follows:

When a direct draught is required as, for instance, in kindling a fire, the damper  $j$  in pipe  $h$  is opened, and the products of combustion from the fire-chamber pass up into the chamber G, and thence through pipe  $h$  direct into the smoke-pipe H, as indicated by the red arrows in fig. 1.

When a circuitous or indirect draught is required, the damper  $j$  is closed, and the products of combustion pass from the chamber G, through pipe  $i$ , into the flue or space C, between the walls  $c c$  of the body B, and down around said flue and up into pipe H, as indicated by the black arrows in fig. 1.

In this last adjustment of the damper  $j$ , the stove is converted into what is generally termed a "radiator."

The tubes  $d$  are air-heating ones, the cold air entering their lower ends from the hollow base A, and passing up through the central passage  $k$  of the chamber G, and thence through the perforated cover D, the air, during this passage, becoming thoroughly heated, and preventing the tubes  $d$  from being burned, as said air absorbs the heat. At the same time, a current of cold air is passing up through the space  $e^*$  between the case  $e$  and the inner wall  $c$  of the body B, and, becoming thereby heated, passes from the upper part of the stove in the same way as that heated in the tubes  $d$ , (see dotted black arrows, fig. 1.) These two currents of air passing up, respectively, through the tubes  $d$  and the space  $e^*$ , effectually prevent the tubes  $d$  being injured by heat.

From the above description it will be seen that a radiating and air-heating stove is obtained within a limited space, that is to say, it may be constructed of quite moderate dimensions, at a reasonable cost, operate efficiently, capable of general application, either as a radiator or an air-heater, or both, for, by having a close cover, D, and a pipe leading therefrom, heated.



air may be conveyed to other apartments than that in which the stove is placed.

Having thus described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

The vertical air-heating tubes *d*, when placed around the fire-chamber *E*, and arranged so as to receive cold air at their lower ends, in connection with the air-heating space or passage *e*<sup>x</sup>, which surrounds the case *e* inclosing the tubes *d*, all arranged substantially as shown and described.

Also, the vertical tubes *d*, in combination with the chamber *G*, pipes *h i*, air-heating passage *e*<sup>x</sup>, and the flue *C* between the walls *c c* of the body *B*, all arranged substantially in the manner as and for the purpose set forth.

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Witnesses:

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