

(No Model.)

F. E. HUMPHREYS.  
FIREPLACE.

No. 578,240.

Patented Mar. 2, 1897.

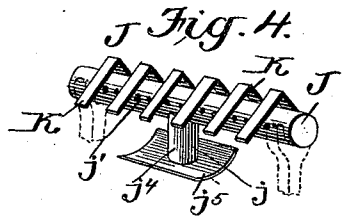
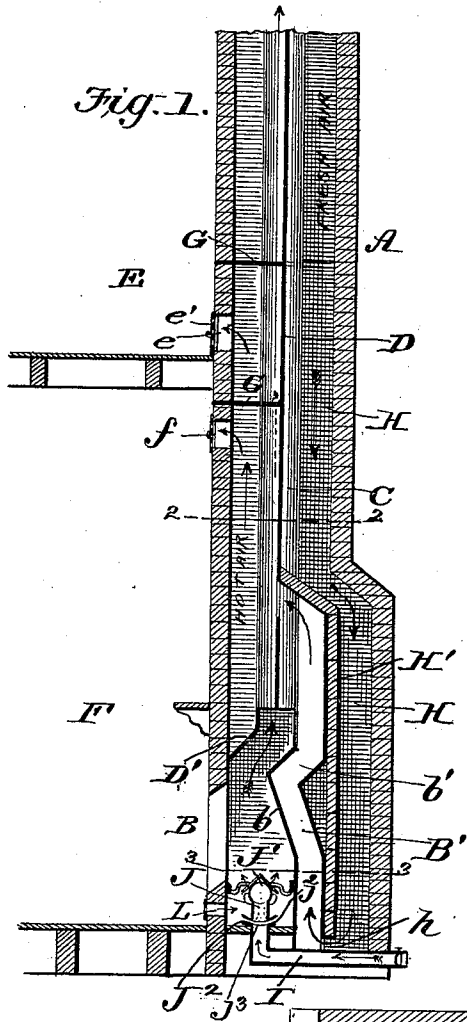


Fig. 2.

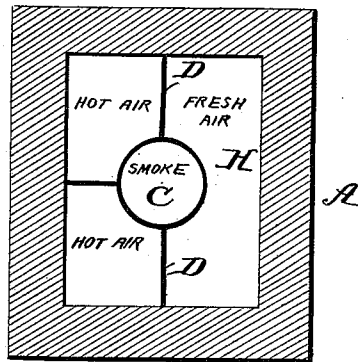


Fig. 5.

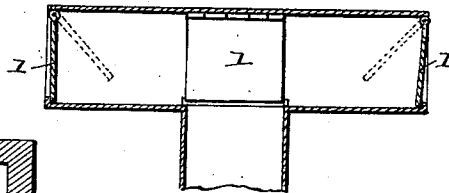
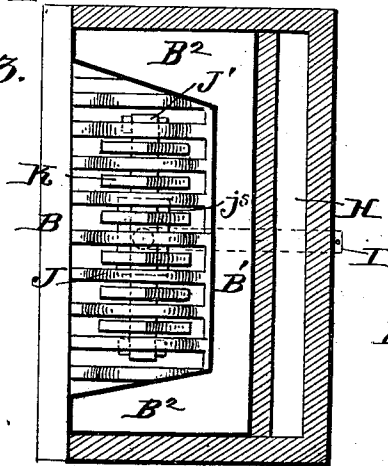


Fig. 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

FRANKLIN EMERSON HUMPHREYS, OF MASON CITY, IOWA.

## FIREPLACE.

SPECIFICATION forming part of Letters Patent No. 578,240, dated March 2, 1897.

Application filed April 30, 1896. Serial No. 689,672. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN EMERSON HUMPHREYS, residing at Mason City, in the county of Cerro Gordo and State of Iowa, have invented a new and useful Improvement in Fireplaces, of which the following is a specification.

My invention is an improvement in heating and ventilating devices, and has for its objects, among others, to utilize or conserve practically the entire heat produced by the combustion of fuel in open fires, to effect a proper circulation of the currents of warm air and an equal distribution of the heated air, both in the room where the fire is located and in lateral or upper rooms to which the heat may be conveyed, and to avoid other objections to the common open fire and render its use practicable as a heating medium.

The invention consists in certain novel constructions and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a vertical section of a chimney and fireplace constructed according to my invention. Figs. 2 and 3 are cross-sections on, respectively, lines 2 2 and 3 3 of Fig. 1. Fig. 4 is a detail view of the oxygen-burner, and Fig. 5 is a detail view illustrating a form of devices for taking in air on the windward side.

The chimney A may be of brick or other suitable material and may be in its general features of ordinary construction, being suitably enlarged at its lower end to receive the portions constituting the fireplace proper, in which the grate or other suitable heating medium may be properly supported.

The fireplace B may be of metal, as preferred, or it may be formed of brick or other suitable material, and from its upper end the smoke-flue C extends up through the chimney, as shown. The space within the chimney surrounding the smoke-flue C forms the hot-air flue or flues. When but a single hot-air flue is desired, this space in the chimney may be an annular one extending entirely around the smoke-flue; but when two or more rooms are to be heated and it is desired to have a separate hot-air flue leading to each I provide vertical partitions D, which divide the space in the chimney into separate

air-flues which may lead to their respective rooms.

In Fig. 1 I show two rooms to be heated, the upper one E receiving air at *e* from its hot-air flue, the discharge of such air being controlled by a register *e'*, which may be of ordinary construction. This register *e'* is shown near to the floor of the room E. The lower room F, being the one in which the fire is located, has the register *f* located near the ceiling, and it is manifest that these registers *e'* and *f* may be located in such manner as to secure the best results in ventilation. Immediately above the registers of the several hot-air flues I arrange diaphragms G, closing such flues and preventing the hot air from passing above the said registers.

The fireplace B may receive a grate, and irons, or other suitable heating medium, and immediately in rear of such place I arrange the hot-air space B', which is deflected forward toward the upper end of the fireplace at *b* and then rearwardly at *b'* and communicates at its upper end with the several hot-air flues. This hot-air space or chamber B' is located at the rear of the fireplace and may communicate with lateral air-heating chambers B<sup>2</sup> at the opposite sides of the fireplace, and the front flue may be extended downward at D' to form itself a heating-surface to receive the direct heat from the heating medium, as may be desired. In supplying the fresh air to the heating space or chamber B' it is preferred to form a fresh-air flue H, extending downward within the chimney alongside the smoke-flue and communicating at its lower end with the heating-chamber B', being divided from said heating-chamber by a course of bricks H' or other suitable non-conducting material. It will be seen that the fresh-air flue H communicates at its lower end *h* with the air-heating chamber B'. While this construction for supplying fresh air to the chamber B' may be preferred, air may be supplied in other suitable manner without departing from some of the broad principles of my invention.

The inlet for fresh air to the fresh-air flue may open on each side of the chimney at the top, and automatic weather-vane funnels may be arranged to take the air on the windward side.

The supply of fresh air for supporting com-

bustion may be furnished at the bottom of the fireplace and is preferably effected by a flue I, which leads from the outer air to what for convenience of reference I term the "oxy-  
 5 gen-burner" J, which is arranged below the grates or andirons and is composed of an upper section J' and a lower section J<sup>2</sup>, the lower section J<sup>2</sup> being provided with a concave top plate j<sup>2</sup> and an opening j<sup>3</sup> through the same.  
 10 The upper section J' consists of a horizontal perforated tube j' and a short vertical tube j<sup>4</sup>, communicating with the tube j' and depending therefrom and arranged at its lower end to move into and out of register with the  
 15 opening j<sup>3</sup> of the concave plate j<sup>2</sup>, and to the lower end of the tube j' is fixed a convex plate j<sup>5</sup>, which coincides with and fits upon the concave plate j<sup>2</sup> of the lower section. This upper section J' is movable upon the lower  
 20 section, so it may be set to communicate with and receive the fresh air from the opening in said lower section or to close such opening entirely or partially to either shut off or regulate the supply of fresh air, as may be de-  
 25 sired. At its top the upper section J' is provided with projecting arms K, which project through the bars of the grate and operate to clear such grate as the burner-section is swung back and forth.

30 The tube j' rests in bearings, as indicated in dotted lines, Fig. 4, and may be rocked therein to set its lower inlet-opening into or out of register with the opening j<sup>3</sup>, which movement may be effected by any suitable  
 35 handle or lever devices.

In the use of old grates or at other times when desired the oxygen-burner may comprise a simple tube leading from the inlet of fresh air and capped or so covered as to al-  
 40 low the passage of air and yet exclude the falling ashes.

The foul air from the rooms may be conducted off through foul-air flues in the chimney or otherwise, as may be desired.

45 Below the fireplace at the front I provide air-inlets at L, controlled by a suitable damper, so air may be supplied to the combustion from the room when desired.

In the operation of my invention it will be  
 50 seen that the supply of air to the fire itself is taken either from below the foundation or at the foundation, or, if desired, it may be taken from the fresh-air compartment of the chimney by means of an oxygen-burner, which  
 55 plan reduces the exhaustion of oxygen from the rooms of the house to the minimum and also diminishes the pressure of air from the front upon the radiation.

The diaphragms, either in whole—that is,

60 covering the whole flue-space—or in two or more parts closing the different passages, constitute important parts of my invention. It is intended to utilize the space above the diaphragms in some cases for exhaust-flues.

It will be understood that the devices for  
 65 taking in air on the windward side may be as shown in Fig. 5 or of any other suitable construction, and I do not herein claim as my invention the specific construction of the said air-inlet devices.

70 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fireplace-heater an oxygen-burner composed of upper and lower sections provided with openings movable into and out of register substantially as shown and described.

2. In a fireplace-heater, an oxygen-burner comprising a lower section having a concave plate and an opening through the same, and  
 80 an upper section having a convex plate and an opening through the same, and a distributor communicating with said opening, the said convex and concave plates being fitted together substantially as shown and de-  
 85 scribed.

3. In a fireplace-heater, an oxygen-burner composed of a lower section and an upper section movable upon said lower section and provided with projecting arms adapted to play  
 90 between the bars of the grate as said section is moved substantially as shown and described.

4. The combination of the fireplace having a hot-air space or chamber and a flue or flues  
 95 leading therefrom, the smoke-flue leading from the fireplace, and the fresh-air flue leading downward along the smoke-flue and opening into the hot-air space or chamber substantially as shown and described.

5. The combination of the fireplace the hot-air space or chamber, the chimney having the smoke-flue leading from the fireplace, the fresh-air flue leading down alongside the  
 100 smoke-flue and opening into the hot-air space, such fresh-air flue being provided near the top of the chimney with weather-vane devices arranged to take in air on the windward side substantially as shown and described.

6. In a fireplace-heater, an oxygen-burner  
 110 composed of upper and lower sections one of such sections being movable with respect to the other substantially as set forth.

FRANKLIN EMERSON HUMPHREYS.

Witnesses:

EVAN MORGAN,  
 ROGER H. HELM.