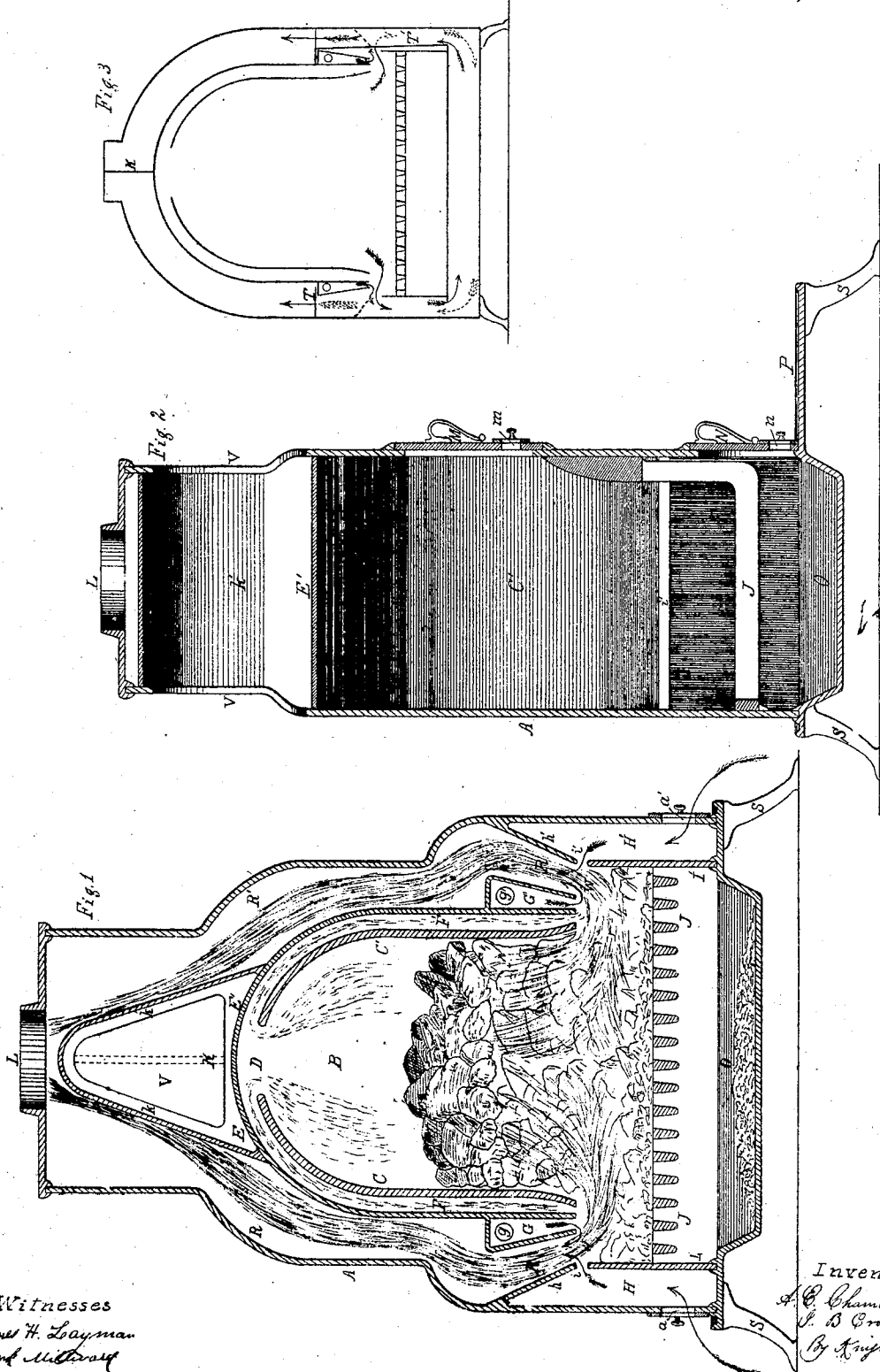


Chamberlain & Crowley.

Fireplace.

N^o 71698

Patented Dec. 3, 1867.



Witnesses
James H. Layman
Frank M. Loring

Inventors
C. Chamberlain
S. B. Crowley
By Knight Bros
Atty.

UNITED STATES PATENT OFFICE.

ADDIS E. CHAMBERLAIN AND JOHN B. CROWLEY, OF CINCINNATI, OHIO,
ASSIGNORS TO CHAMBERLAIN & CO., OF THE SAME PLACE.

FIRE-PLACE.

Specification forming part of Letters Patent No. 71,698, dated December 3, 1867.

To whom it may concern:

Be it known that we, ADDIS E. CHAMBERLAIN and JOHN B. CROWLEY, both of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Fire-Places; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Our invention relates to that class of fire-places having a descending draft; and the first part of our improvement consists in an arrangement whereby the smoke and other products of combustion are compelled to pass through the incandescent fuel, which is contained within a suitable extended grate or fire-basket, thus consuming the smoke and insuring the utmost economy in the use of the fuel.

The second part of our invention consists in providing the interior of the fire-chamber with two descending flues, which are open at the top, and which serve to carry off the smoke when the doors are opened.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of our fire-place as applied to a heating-stove, the fire-doors being supposed to be closed, so as to produce the most active combustion. Fig. 2 is a vertical transverse section of the same, and Fig. 3 is a diagram representing a modification of our improvement.

A represents the outer shell or case of the stove, which contains a fire-chamber, B, having side plates, C C', whose upper portions are curved inwardly a sufficient distance to leave a passage, D, between them. Placed a suitable distance outside the plates C C' are two more curved plates, E E', which form descending flues F F', that communicate with the passage D at the top of the fire-chamber. The lower ends of the outer plates, E E', are prevented from being burned by means of air-channels G G', which receive a constant supply of fresh air through the apertures g g' in the shell of the stove. The interior plates, C C', are cast somewhat thicker than the outer ones, in order that they may be able to stand the heat; but in case they should burn out they can be replaced as readily as any ordinary stove-plate.

H H' are cold-air chambers formed at the bottom of the stove by means of the shell A,

vertical plates I I', and inwardly-inclined plates h h', and a fresh supply of air is allowed to pass from said chambers into the interior of the stove through the slits i i', which may extend the entire depth of the stove. The quantity of air which enters the chambers is regulated by the registers a a'. The slits i i' are about on a line with the bottoms of the plates C C' E E', and situated a proper distance below these slits is our grate J, which extends laterally under the flues F F' and air-channels G G'. The object of this lateral extension of the grate is to compel all the smoke and gas which descend from the fire-chamber B to pass through a mass of incandescent fuel, and also to be brought into communication with the currents of fresh air which are entering through the channels G G' and slits I I'.

That portion of the shell of the stove which is above the fire-chamber B is divided into two parts by the inwardly-inclined flue-strips k k', whose lower ends are supported upon the plates E E', while their upper ends are united a short distance below the collar L, upon which the stove-pipe is fitted. This provision of the flue-strips k k' serves to separate the ascending body of flame into two branches, by which means the shell of the stove is more thoroughly heated, and the greatest amount of heat is radiated therefrom with the least consumption of fuel.

V is a chamber formed by the plates E E' and the flue-strips k k', and this chamber extends completely through the stove, from front to rear, and serves to warm the air as it is brought in contact with the said heated flue-strips.

Instead of the two inclined flue-strips a single vertical one, K, may be employed, as shown in Fig. 3, and as indicated by dotted lines in Fig. 1; but in this case the air-heating chamber V would be omitted. The front of the stove is provided with a fire-door, M, and an ash-door, N, and these doors have registers m n for the admission of air, either above or below the burning fuel. The stove has a customary ash-pit, O, and hearth-plate P, and is supported upon feet S S.

R R' are ascending-flues, situated between the plates E E', channels G G', inclined plates h h', and the outer shell, A.

When it is desired to start a fire in the stove, a quantity of coal is placed upon the grate J, so as to fill the fire-chamber B about half-full. The kindling is then placed upon the coal and the fire lighted. The air necessary to support combustion enters the fire-chamber through the register *m*, and the light smoke which ascends from the burning kindling escapes through the passage D and descending flues F F'; but as soon as the coal is ignited the currents are completely reversed, and, instead of ascending within the fire-chamber, they now descend, as clearly shown in Fig. 1. The coal at the bottom of the fire-chamber soon becomes a mass of incandescent fuel, and all the smoke and gas which emanate from the more elevated portions of the coal are compelled to pass through this mass of incandescent fuel, and, while thus intensely heated, to pass between the warmed and finely-divided jets of air which enter through G and H, and the heated smoke, being thus attacked on both flanks by the finely-divided and heated air, becomes completely consumed.

The air-channels G G' and slits *i i'*, being located at a point where the heat is the most intense, serve to keep those portions of the stove from becoming "burned out." These points of intense combustion we call the "throats," W W'. Whenever the door M is opened for the purpose of replenishing the fire, any smoke or gas which may have collected in the upper part of the fire-chamber is prevented from puffing out into the room by means of the flues F F', as the smoke will descend through these flues the moment the door is opened.

The registers *a a'* of the cold-air chambers H H', being located near the bottom of the stove, are constantly drawing off a quantity of impure air, which always settles near the floor, and our fire-place thus acts as a ventilator to the room in which it is used. When a fire-place has a good draft the interior plates, C C', may be omitted, and the outer ones, E E', may be employed alone.

For a base-flued stove and where it is de-

sired to conserve all the available heat, we introduce partitions T T', which prevent the direct ascent of the smoke, and compel the two branches thereof to enter front and rear flues, whence, flowing in reverse directions under and athwart the hearth-plate, they finally escape into the ascending flues.

This modification of our invention is clearly shown in Fig. 3, in which the strong red arrows indicate the currents which proceed from the front of the stove, while the rear currents are indicated by the dotted red arrows. An inferior modification of our invention may have a single descending flue down the rear of the grate, the latter being, of course, extended rearward, and the air-inlets and escape-flues being transposed to suit.

We have described our fire-place as applied to a heating-stove, but it is evident that by merely omitting the outer shell it can be adapted to a grate or open-front fire-place.

We claim herein as new and of our invention—

1. An open-front stove or fire-place, arranged substantially as herein described, to take the air to support combustion from above and downward through the fuel.

2. In an open stove or fire-place constituted as above specified, we further claim the extended grate J, substantially as and for the purposes set forth.

3. In an open stove or fire-place constituted as above specified in the first clause, we claim the interior plates, C C', for the purpose of forming the descending flues F F', substantially as herein explained.

4. In combination with the elements of the first clause, we further claim the flue-strips K k', as and for the object stated.

In testimony of which invention we hereunto set our hands.

A. E. CHAMBERLAIN.
J. B. CROWLEY.

Witnesses:

GEO. H. KNIGHT,
JAMES H. LAYMAN.