(No Model.) 2 Sheets—Sheet 1.

# W. O. WHEELER.

## FIRE PLACE.

No. 394,042. Patented Dec. 4, 1888.

Fig. 5.

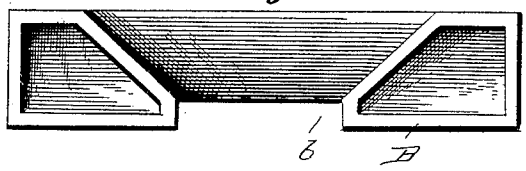



Fig. 2.

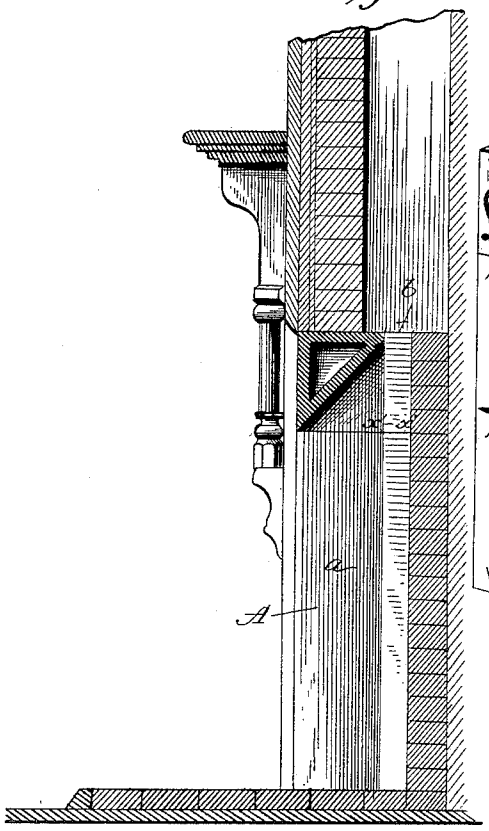



Fig. 1.

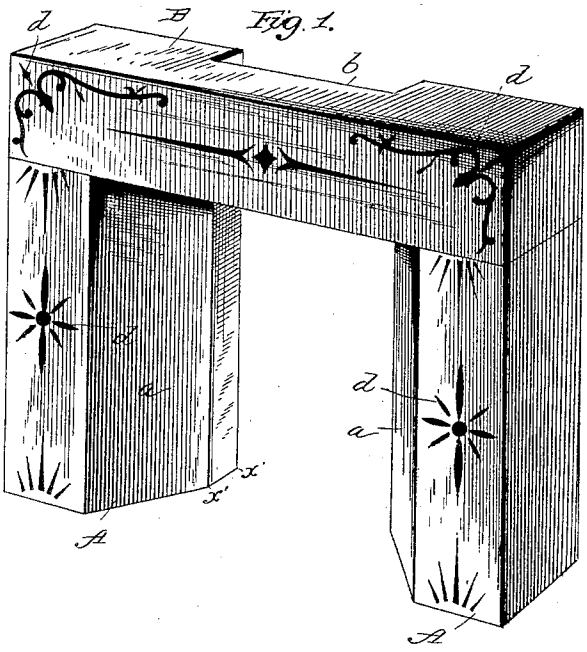



Fig. 3.

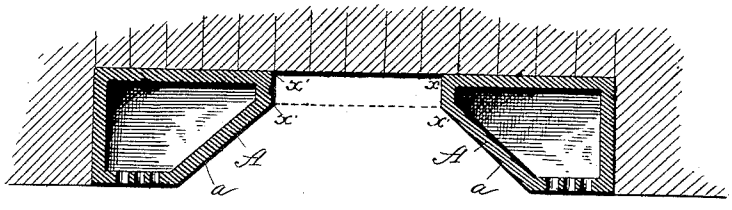
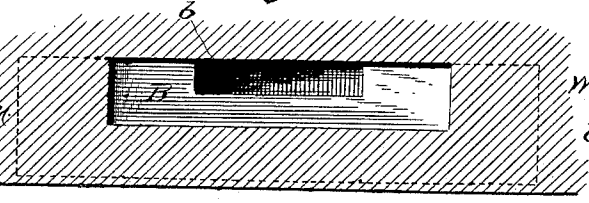



Fig. 4.




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by Ellis & Spear
Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

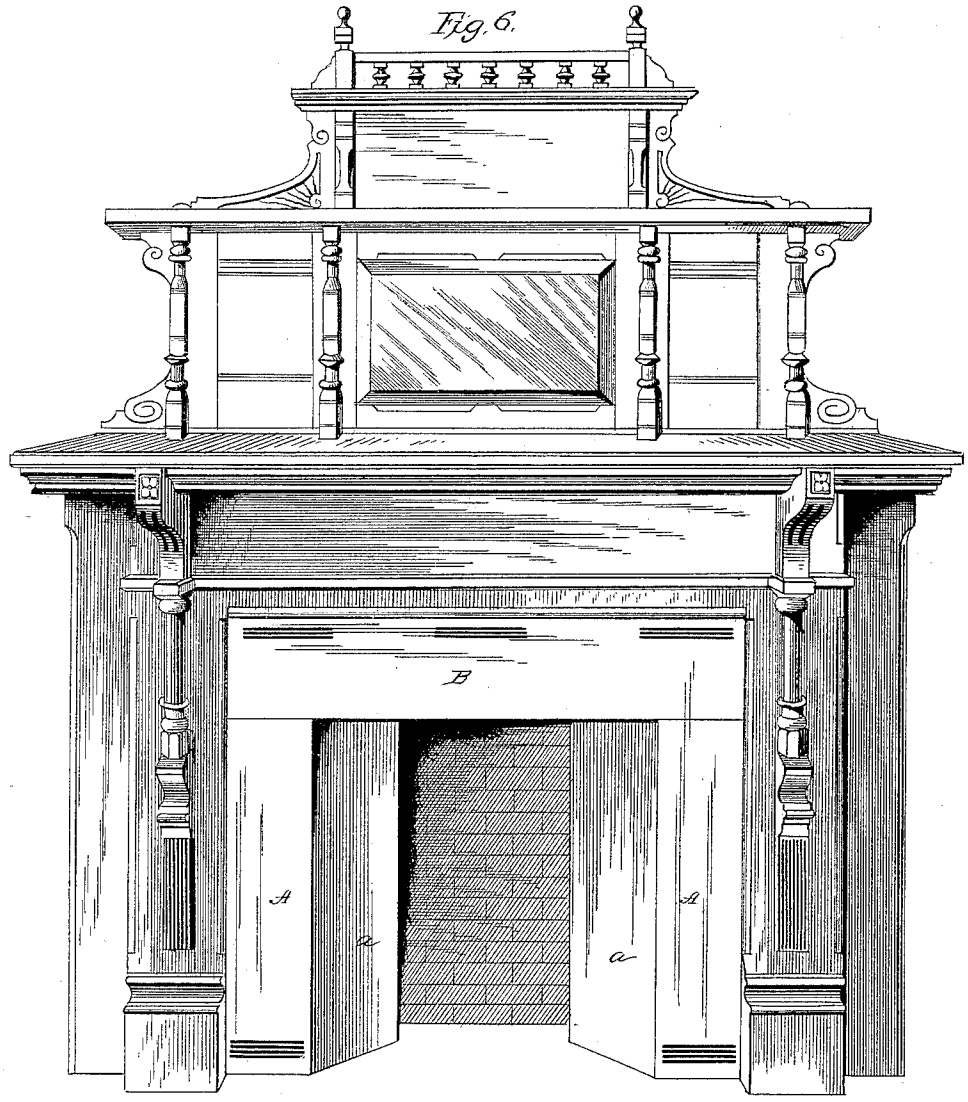
(No Model.) 2 Sheets—Sheet 2.

# W. O. WHEELER.

## FIRE PLACE.

No. 394,042. Patented Dec. 4, 1888.

Fig. 6.




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# UNITED STATES PATENT OFFICE.

WILLIAM O. WHEELER, OF SHARON, CONNECTICUT.

## FIRE-PLACE.

SPECIFICATION forming part of Letters Patent No. 394,042, dated December 4, 1888.

Application filed April 11, 1888. Serial No. 270,296. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM O. WHEELER, of Sharon, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Fire-Places; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention which is the subject of the following specification relates to the form of fire-places and the flues leading therefrom, the general object of the invention being to insure perfect draft in the fire-place, a perfect combustion of the fuel, and the production of the greatest amount of heat possible in an open fire-place with a given amount of fuel.

The advantage of the open fire-place in respect to ventilation of the rooms and in respect to the greater healthfulness and comfort derived from the radiated heat of an open fire are well known. The general principles necessary to be observed and followed in building chimneys and fire-places in order to secure proper draft are so little understood by the ordinary chimney-builder that it may safely be said that bad fire-places and bad drafts are the rule, and smoky chimneys have almost become proverbial. These general principles were taught by the Count of Rumford. His practical genius observed and his experiments demonstrated that the throat of the fire-place through which the products of combustion escaped should be small as compared with the other parts of the flue of the chimney. This is a cardinal point in the construction of fire-places and chimneys; but, by reason of its not being generally understood by practical brick-layers, the practical benefits of the discoveries of the distinguished inventor have not become generally available.

One object, therefore, of my invention is to provide means to supplement the deficient skill of the brick-layer and to supply a fire-place and flue of such form that it may be manufactured and sold already fitted to be placed in position in its proper relation to the chimney, and the work of placing it in position may be done by unskilled workmen. In addition to this object I have sought also to better arrange the location of the throat of flue in its relation to the fire-place, to provide a better sloping surface for the direction of the products of combustion to the flue, to practically extend the flue down to the bottom of the fire-place, and to better proportion the dimensions of the fire-place.

In the accompanying drawings, Figure 1 shows a perspective of my improved fire-place. Fig. 2 shows a section taken vertically in the center from front to rear. Fig. 3 is a horizontal section on line $x\ x$ of Fig. 1. Fig. 4 is a horizontal section on line $y\ y$ of Fig. 1. Fig. 5 is a bottom plan view of the upper section of the fire-place. Fig. 6 is a front perspective view.

The fire-place represented in these drawings is designed to be manufactured, preferably, in parts and to be set up in a recess in the chimney made rectangular, or approximately so, and fitted to receive the fire-place in proper relation to the flue of the chimney. As represented in the drawings, the fire-place consists of three parts, two of which are duplicates of each other, so that practically in the manufacture only two parts are required to be made. These parts may be made of any suitable material, but preferably of fire-clay, as this is the best material, by reason of its lower conducting power, for radiating heat into the room. The two parts A A form the sides or jambs of a fire-place. They are made, preferably, in the form shown, and when designed for fire-chimneys built expressly for them are rectangular in cross-section, excepting on the faces $a$, which form the flaring sides of the fire-place. These are beveled at an angle of forty-five degrees to a line drawn directly from front to rear, this angle being that prescribed by Count Rumford, heretofore referred to; but the bevel or inclination is not carried quite back to the rear wall. The edges are truncated, as shown at $x'\ x'$, to form square ends, and these ends form with the back three sides of a flue extending down to the bottom of the fire-place. This flue, though opening at the front into the fire-place, is still a distinct and practically-operating flue, as I have demonstrated by experiment. Its depth is one-fourth that of the fire-place, and its width is one-half that of the front of the fire-place, these proportions having been found by practical experiment best for the purpose. The position of the vertical walls of the flue

is, however, such in relation to the inclined walls of the fire-place that every part or surface may when heated radiate heat into the room.

The upper part of the fire-place is formed of a piece, B. This in general form is a square beam resting on the vertical pieces A A. Like these pieces it is made hollow. In the rear face is formed the fire-place throat *b*. This in width and depth corresponds exactly with the flue in the rear of the fire-place heretofore described, and when the piece B is in place the throat is directly over the flue. This throat is formed by a rectangular recess in the rear face of the piece B, and the rear wall of the flue will be formed by the face of the brick wall against which this piece is set. The throat proper is in the upper part of the piece. From the upper surface it is inclined to the front downward at an angle of forty-five degrees, with an outward flare corresponding to that of the fire-place. This incline forms, therefore, what may be called the "ceiling" of the fire-place, sloping backward and upward and narrowing at the described angle from the front to the flue, so that the products of combustion are directed backward and upward and concentrated to the throat instead of being turned to the front by upwardly-sloping rear walls, as is often the case with fire-places as heretofore constructed.

By reason of the backward and upward slope and lateral contraction of the slope on the lines of the flaring sides of the fire-place no horizontal surface or recess is left anywhere in the upper part of the interior of the fire-place to cause eddies in the smoke. The throat, as heretofore explained, is of the same dimensions in cross-section as the flue in the back part of the chimney, and is also in line therewith. Therefore all the directly-upward draft is in a straight vertical line and all the indirect or rearward draft is in converging lines between sloping surfaces that converge on sides and tops to the throat.

I will now give the proportions of the parts which I have demonstrated to be best for the combustion of the fuel, the radiation of heat into the room, and the draft of the fire-place. As before stated, the angle of the sides is forty-five degrees, and the same angle to a horizontal plane is given to the upper slope. The width of the back flue of the fire-place is one-half that of the front of the fire-place. The height and width of the front of the fire-place, as shown, are the same; but for the best practical effect the height should be three-quarters of the width of the front. I have found that the best proportional depth for the rear vertical flue is one inch to every front foot of the front opening of the fire-place. The sectional area of the throat is to that of the front of the fire-place as one to twenty-four.

The vertical pieces are shown as provided with holes, which may be in rosettes or other ornamental figures, as *d*, and the horizontal piece has like holes in similar ornamental figures. Communication is provided between A and B by means of openings in the lower side of B conforming to the opening in the top of the piece A, as shown in dotted lines at *e*, or the ends of the pieces A and B are closed, and with the construction above described there may be free circulation of air through the interior of the fire-place wall. The air is drawn in at the lower holes and passes through the interior heated chambers, and is discharged through the upper holes. The holes below admit air from the lower part of the room, and this air is heated in the hollow parts and escapes from the opening in the horizontal piece. Thus a circulation of the air in the room is maintained, and the heat is more evenly diffused in all parts of the room.

The parts A and B may be made of a variety of sizes to suit old or new buildings, and may be ornamented by tilings or in any well-known or suitable way. For old and flaring fire-places the vertical sides may be sloped to the rear. When so made they are ready to be placed in any old form of fire-place.

In building new chimneys for my improved fire-places all that is required of the bricklayer is to build the chimney with a plain flue of ample size and with a rectangular recess for the reception of the fire-place above described, this consisting of the three pieces molded and baked in a manufactory. No expensive and difficult cutting and fitting of bricks are required, which are necessary when the fire-place is to be built of bricks, and, what is of more importance, no skill is required on the part of the brick-layer beyond the skill or rules of his art in laying one brick accurately on another. The pieces of the fire-place are made accurately according to pattern. They have all smooth surfaces fitted well to conduct the smoke and radiate heat, and with them a perfect fire-place may be secured under all circumstances with economy and with certainty. The rear flue extending down to the bottom of the fire-place acts with singular effect upon the combustion of fuel. It is efficient either with wood or coal; but with the wood the effect is more observable. The wood is wholly consumed, and no coals or brands or unconsumed portions are left, but only ashes.

In respect to the location of the flue in the back part of the fire-place extending to the bottom and the slope to the throat at the top, I do not limit myself to the precise construction formed of three pieces, as heretofore described, as the number of pieces of which the fire-place is built does not effect the formation of the flue and the sloping surfaces of the throat.

I claim as my invention—

1. A fire-place formed of the side pieces made flaring and a horizontal piece, as B, resting thereon, with a throat formed therein and sloping surfaces to the throat, substantially as described.

2. In combination, the side pieces, as A, formed with the sloping jambs, and truncated edges forming a rear flue at the fire-place extending to the bottom, and a horizontal piece, as B, having a throat in line with the flue and sloping surfaces upward and backward to the throat, substantially as described.

3. In combination, the hollow side pieces formed sloping, and the hollow horizontal pieces having a throat in its rear surface, with sloping surfaces upward and backward to the throat, the said hollow pieces having holes for the passage of air, substantially as described.

4. A fire-place having its upper part sloping upward and backward to the throat of the flue, with a flue extending to the bottom of the fire-place, with its sides and back continuous with the sides and back of the throat, and with the sides at right angles to the back, and with the sides of the fire-place sloping back from top to bottom to the edge of the back flue, all substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. O. WHEELER.

Witnesses:
ROBERT E. MORRIS,
JNO. JOY EDSON.