G. CHILSON.

Fire Place.

No. 7,411.

Patented June 4, 1850.

Fig. 3

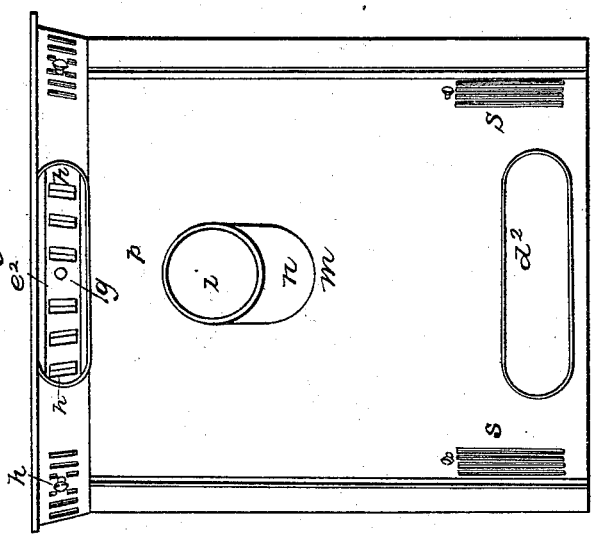


Fig. 2

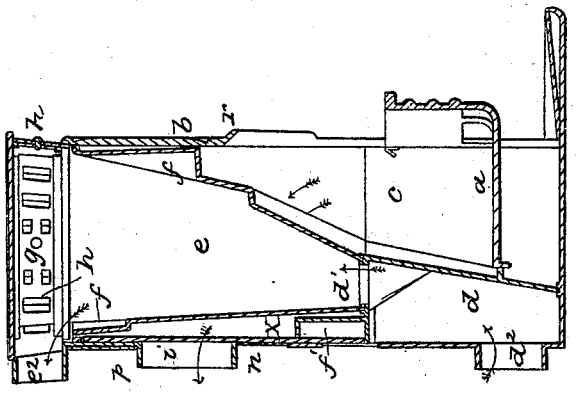
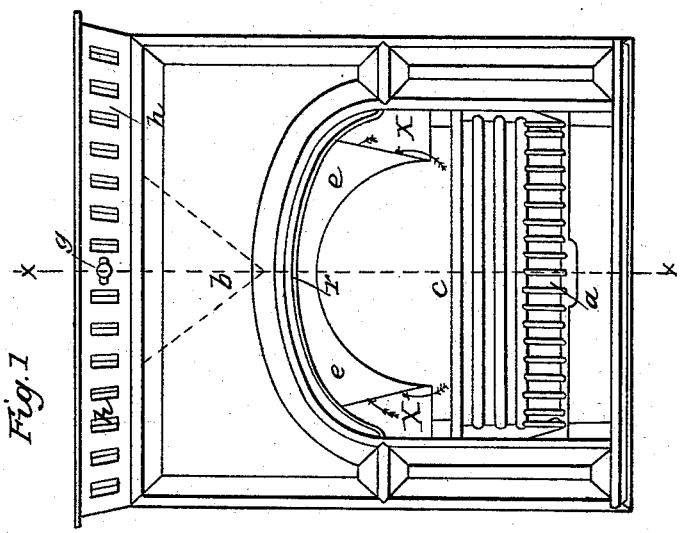


Fig. 1



UNITED STATES PATENT OFFICE.

GARDNER CHILSON, OF BOSTON, MASSACHUSETTS.

FIREPLACE-GRATE.

Specification of Letters Patent No. 7,411, dated June 4, 1850.

To all whom it may concern:

Be it known that I, GARDNER CHILSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Fuel-Saving Ventilating Open Fireplace or Grate, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawing, in which—

Figure 1, is a front view. Fig. 2, is a section on line *x*, *x*, of Fig. 1. Fig. 3 is a rear view.

It has long been considered, a desideratum to make an open fire, with all its comforts without being liable to its objections; such as exhausting the room, in which it is situated, of air to be supplied with cold external air, from all the openings around the room, and creating unpleasant drafts, and an unequal warmth, throughout the apartments; and preventing the great loss and waste of heat, from the fuel, that passes up the chimney, in ordinary grates or fire places, amounting at least to two thirds, in most cases. I have endeavored to supply this deficiency, in my present invention, in which I am enabled greatly to economize heat, and to warm other apartments, than the one in which the fire is placed, when desired. The structure is equally applicable, to wood or coal, of any description.

The construction is as follows. An open fire place is formed of the proper capacity, in which andirons for wood, may be placed, or a grate (*a*) for coal substituted, as shown in the drawing. The front (*b*) may be of any ornamental pattern. The fire box (*c*) is surrounded with an air chamber, (*d*) and lined with soap stone, or fire brick which together with the supply of cold air, on the interior prevents the fire box, from becoming red hot; which would be highly detrimental to the air heated. At the top of the air chamber, (*d*) back of the fire there is an oblong opening, surrounded by a sand groove, or double flanch at (*d'*) into which the lower end of a hopper shaped chamber (*e*,) fits. The chamber (*e*,) is an oblong, inverted, truncated pyramid, with the angles rounded and as it extends up, it expands out to the front, back and sides of the outer case; but leaving below a space (*x*) all around it, for the passage of heat, flame, etc. The front of this chamber, (*e*) above the fire, should be shielded against becoming red hot by a lining of soap stone, or other non-conductor; a recess (*e'*) being made there for its reception. There is a small projection, in front and rear, at (*f*) at the top of the chamber, as shown in the section, in Fig. 2, and by the dotted lines Fig. 1, which serve to direct the current without forming eddies, that would be prejudicial to the draft; a similar projection is made at (*f'*), at the bottom of the conical chamber, at the back and for the same purpose. Above this chamber there is a cap, (*g*) the top of which is sufficiently high, to admit a paneled damper, (*h*) to be formed in the front, and sides of the rim, through which when the dampers are open, the air issues into the apartments properly warmed. The inlet for the fresh air, is at the bottom of the air chamber, (*d*) through an opening (d^2), from which a pipe leads through the wall of the apartment into the external air, and if it is to be taken to a separate apartment above when warmed, it passes off at the top of the air chamber, (*e*) at the opening (e^2,) and thence up to the apartments to be heated. The course of the products of combustion, is up around, the chamber (*e*) which they entirely envelop, and pass around to the back through the openings on each side at the upper corners of the fire box, and thence to the opening (*i*) into the flue at the back. Thus the chamber (*e*) through which the fresh air passes, is surrounded by flame or heated gases, and the gases are drawn to the exterior, so as to heat the sides of the fire place, and thus aid in economizing heat, while they are made to pass around laterally, till they have exhausted their caloric, and in this course there is no descending flue, which could not be used without endangering, the drafts of an open fire. It will be perceived from the configuration of the parts, that the best arrangement, is preserved for the radiation of the heat directly from the fire. By the opening from the air chamber, any amount of warm, fresh air can be let into the apartment, which will keep up the supply equal to the consumption of the fire; thus ventilating and warming at the same time, and entirely avoiding the unpleasant cold, currents from windows and doors, before spoken of; altogether effecting a saving of more than fifty per centum of the fuel. I purpose to use broad,

shallow, grates in my apparatus, to form an extended fire bed, which I find the most economical way of burning coal. At the back of this apparatus, when made portable, I form an oblong opening, (*m*) Fig. 3 over which a plate, (*n*) fits on the inside, and slides up and down, in proper grooves made for the purpose. This plate has a circular hole, in it surrounded by the usual collar, (*p*) to attach the exit pipe, to, or to enter the chimney. This improvement will cause the fire place, to be readily adapted to any chimney, or other connection, oftentimes saving the difficulty and expense of cutting a new hole through a chimney, or forming an elbow joint. This is applicable to stoves and fire places and for changing the size of the collar of several varieties, as well as the present structure for all which purposes, I wish to secure it.

It is obvious that the air chambers, grate, and front, can be set into an ordinary fire place, without using the back casing and not change the principle; or materially changing the action, and that their form can be modified, to suit circumstances; for instance the upper chamber (*e*) might be round, or triangular, in its cross section if more convenient. The front opening above the fire, has a projecting flanch, or bonnet, (*r*) standing out at an angle, to aid in perfecting the draft, which is very essential when the course of the draft, is like that employed by me. When air cannot be admitted at the back of the lower air chamber, (*d*) it may be taken in on either or both sides, either from the room, or other place, for which purpose I have supplied a paneled damper, at (*s*) see Fig. 3. Either of the above described air chambers, can be used alone, combined with the open fire, but I deem their employment in conjunction the most perfect.

Having thus fully described my improvements, in my ventilating open grate, and fire place, what I claim therein as new and for which I desire to secure Letters Patent, is—

1. The combination with the open fire place or grate having the side drafts as described, of the air heating chambers consisting of an air chamber surrounding the fire and a projecting chamber above surrounded by heat substantially as above set forth.

2. I claim dividing the drafts of an open fire, and causing the products of combustion, to be drawn off at each end of the fire, as herein described. I also claim the sliding collar, at the exit pipe, in the manner and for the purposes specified.

GARDNER CHILSON.

J. J. GREENOUGH,
ROWLAND TWIS.