W. A. HOLBROOK.

Grate.

No. 163,012. Patented May 11, 1875.

Fig. 1.

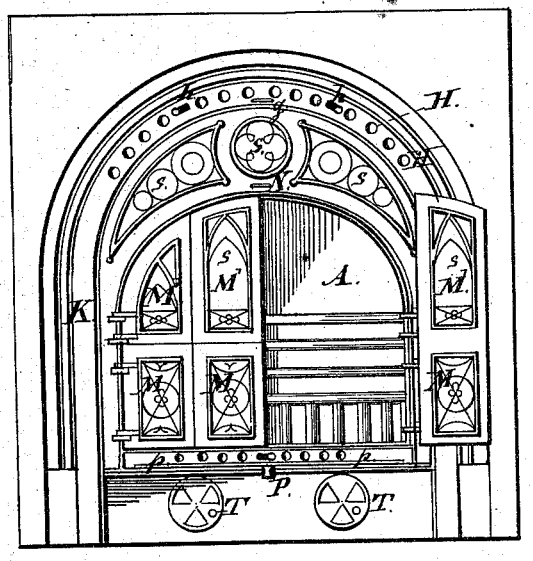
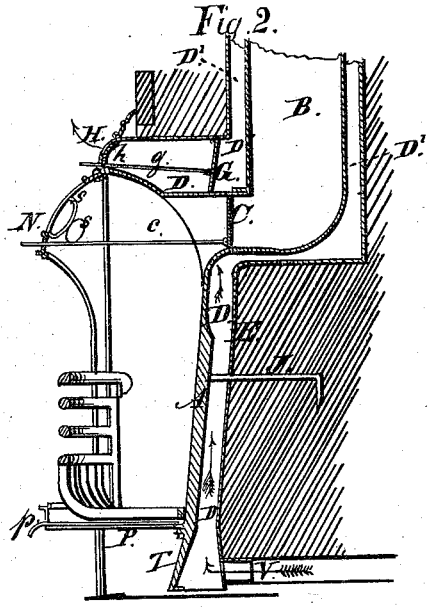


Fig. 2.



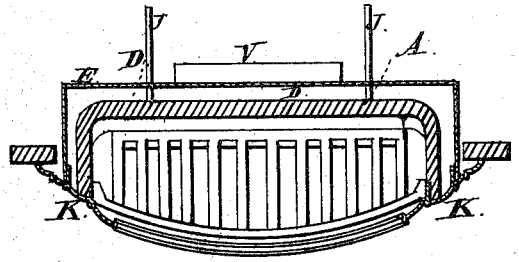


Fig. 3.

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UNITED STATES PATENT OFFICE.

WALTER A. HOLBROOK, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **163,012**, dated May 11, 1875; application filed January 8, 1874.

To all whom it may concern:

Be it known that I, WALTER A. HOLBROOK, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain Improved Heating and Ventilating Grate, of which the following is a specification:

The object of the present invention is to provide a means for utilizing the heat radiated from the back wall by fitting the grate with an air-space in rear of the back wall, into which space fresh air from out-of-doors, or the lower stratum of cold air within doors, is admitted, and from whence, at a point above the grate, warm air passes out into the room, thus producing a circulation whereby the air already in the room is warmed; or a ventilation is secured by the introduction of fresh air, which is warmed in its passage into the room.

In the accompanying drawing, which forms a part of this specification, Figure 1 represents a front view of my improved grate. Fig. 2 is a vertical central section of the same from front to rear, and Fig. 3 is a horizontal section taken at a point just above the basket.

In the said drawing, A represents a back wall, made to present in form the usual contour; but, instead of being made of fire-clay, as is usual, I prefer that it should be made of cast-iron. From the upper part of this back wall proceeds the smoke-flue B, guarded by a valve or damper, C, which operates as dampers so located commonly operate; but, owing to the fact that this damper is not accessible readily, I connect to it a rod, *c*, which extends out through the fire-chamber to the front part of the grate, and matters are so arranged that by pushing or pulling this rod the damper will be closed or opened, as the case may be. Surrounding the rear of the back wall A is an air-space, D, inclosed by a wall of sheet metal, E, which I prefer to make of galvanized sheet-iron, as such surface does not freely absorb the heat. This air-space D is extended up to surround the smoke-pipe, and may be carried up the chimney to any height desired, as shown at D′. I contemplate making openings from this upper portion D′ of the air-space into the upper part of the room, near the ceiling; or the opening may be made into a room above. A damper, G, connected to a rod, *g*, serves to open and close communication between the portions D and D′ of the air-space. The space D extends over the upper part of the grate out to the front, and is there provided with the exit-register, consisting of the row of holes H, which may be opened or closed at pleasure by a slide, *h*. J J are the anchors for holding the grate and appliances in place, being embedded in the wall of the building. To the sides of the casing K, in front of the grate, are hinged the folding doors M M′, made to disclose, when open, the entire front of the grate, from the hood N down to the ash-pan P. The upper series M′ may be allowed to remain closed while the lower series are opened, in which position said upper series will act as a "blower" usually acts to fan the fire by increasing the draft; or the whole surface may be closed by closing all of the doors, and forcing the draft through the register *p* of the ash-pan, which will still further increase the effect of the draft; or, said register being closed at the same time, all currents are shut off, and the fire may thus be caused to smolder and keep for a long time; or, as a further regulation, the register lower-doors M and the register *p* being closed, the upper doors M′ may be opened, which will give a draft over the fire, but not through it. The doors and hood above are shown fitted with isinglass or mica plates *s*, so that the fire-light shall shine cheerfully through them when closed. T T are registers for admitting the lower stratum of cold air from the room into the air-space D in case fresh air cannot be obtained.

In this improved grate the air in the space D, being heated, rises and passes in a warm current out at the register H into the room, rising to the upper part of the room, while the cold air, being heavier, as well as the foul air laden with carbonic acid, sinks to the bottom of the room, and is drawn into the grate, thus producing a thorough ventilation and warming where fresh air is admitted into the air-space, or simply warming, with partial ventilation, where the air of the room is ad-

mitted from its lower coldest stratum through the registers T T, instead of fresh cold air from outside by way of an aperture, V.

Having thus fully described the construction and operation of my invention, that which I claim as new, and desire to secure by Letters Patent, is—

The combination of the open grate, the fire-back A, the air-space D, the cold-air aperture V, the registers T, the damper G, register H, and chamber or space D′, all as and for the purposes specified.

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Witnesses:

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