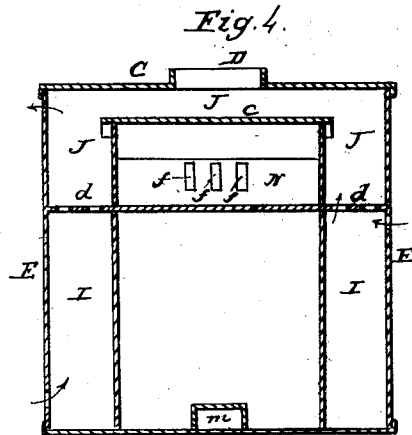
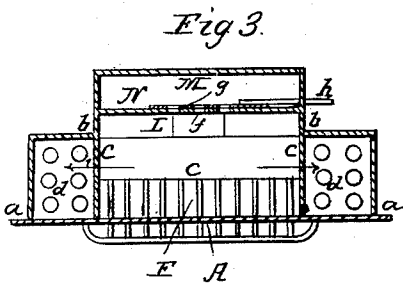
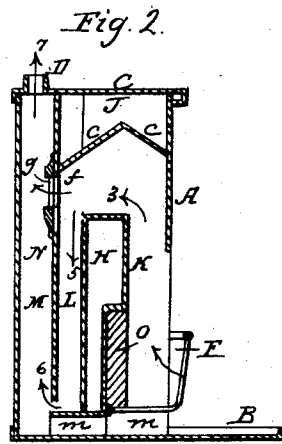
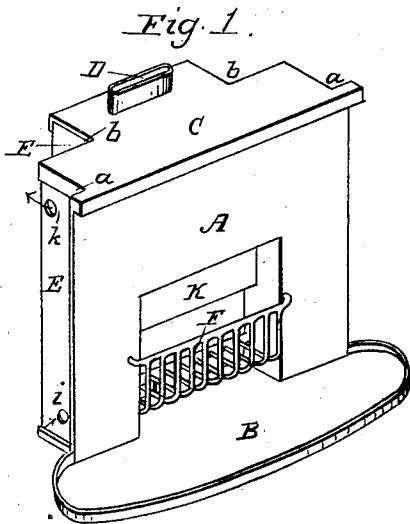


W. T. McMILLEN.
 Portable Hot Air Coal Grate.

No. 28,390.

Patented May 22, 1860.



Witnesses:
 J. Cohen
 J. Hirsch.

Inventor:
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 per atty H. B. Strickland

UNITED STATES PATENT OFFICE.

WM. T. McMILLEN, OF ST. LOUIS, MISSOURI.

COAL-GRATE.

Specification of Letters Patent No. 28,390, dated May 22, 1860.

To all whom it may concern:

Be it known that I, WILLIAM T. McMILLEN, of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Portable Hot-Air Coal-Grates; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, represents a perspective view of the grate complete. Fig. 2 represents a vertical transverse section thereof. Fig. 3, represents a horizontal section, and Fig. 4, represents a vertical longitudinal section.

Similar characters of reference where they occur in the several drawings denote like parts of the grate, in all the figures.

The nature of my invention consists in the manner in which I have arranged and combined the hot air chambers and flue passages, so as to have four communicating hot air chambers viz: at the two sides, the back, and over the top of the grate, thus economizing all the radiated heat as also a diving and ascending flue.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

The general form of the portable grate is distinctly seen in Fig. 1, in which—

A is the front plate; B, the hearth; C, the top plate, with the exit flue D, in it; E, the end plate, and F the fire pot or box. There are two square recesses *a*, *b*, in the ends, for the purpose of adapting the grate to the heating of apartments overhead, or for using all the heated air in the apartment in which the grate stands, as may be desirable. When apartments above are to be heated, the grate is set into the fire place flush with the recess *a*; but when used for heating a single apartment, then it is set into the fire place flush with the recess *b*.

The four hot air chambers are seen in the drawings at H, I, I', J; those H, I, I', communicate underneath the plates *c*, *c*, Fig. 3, as shown by the arrows 1, 1; those I, I', J, communicate through the perforated plates *d*, but should it be preferable to keep the heated air in J, separated from that heated in the other chambers, a damper, or tight plate may be substituted for those *d*.

The fire back K, forms one of the walls of the hot air chamber H, and immediately

behind this hot air chamber H, is a diving flue L, which at the bottom (*e*) leads into an ascending flue M, and to the exit D. Between the diving and ascending flues L, M, which are arranged one directly behind the other, is the plate N, which has a flue opening *f* in it, covered by a damper *g*, having a rod *h*, attached to it, so that in starting the fire the draft may be direct, as shown by the arrows 2, 3, 4, but when freely burning, the flue opening *f* is closed and the draft then takes the direction of the arrows 2, 3, 5, 6, 7, thus leaving three sides of the air chamber H, exposed to the fire or the heated products of combustion.

Where the burning fuel lies against the fire back, I propose to put in fire brick *o*, to prevent the air in the chamber H from coming in contact with the red hot plate.

The plate *c*, as seen in Fig. 2, has a comb or angle at its top, and inclines both front and rear from said angle. The object of this is to make the plate act as, a deflector, to turn the draft toward the flue, and a radiating plate for the hot air chamber J, above it. The cold air may enter at *i*, *i*, and after it is heated, pass out at *k*, or if preferred, through opening in the top plate C. *m* is a draft opening to draw in the ashes when the grate is raked, it leads from underneath the fire box, directly through the diving flue, and into the ascending flue M.

I am aware that many fire places and portable grates have been made, with hot air chambers, passages, flues, and even with diving flues, but not arranged as mine are. I believe I get more radiating surface, and a greater extent of hot air chamber, with less interruption of the draft than in any of these contrivances of which I have knowledge. My fire box F—hot-air chamber H—diving flue L, and ascending flue M, are arranged one behind the other, and not at the sides as is almost universally the case.

What I claim as my invention and desire to secure by Letters Patent is—

The arrangement, and location, of the hot air chambers H, I, I', J, with their communicating passages, and with regard to the fire box, and the diving and ascending flues L, M, whereby I economize heating and radiating surface, without impeding the draft as set forth.

W. T. McMILLEN.

Witnesses:

A. B. STOUGHTON,
E. COHEN.