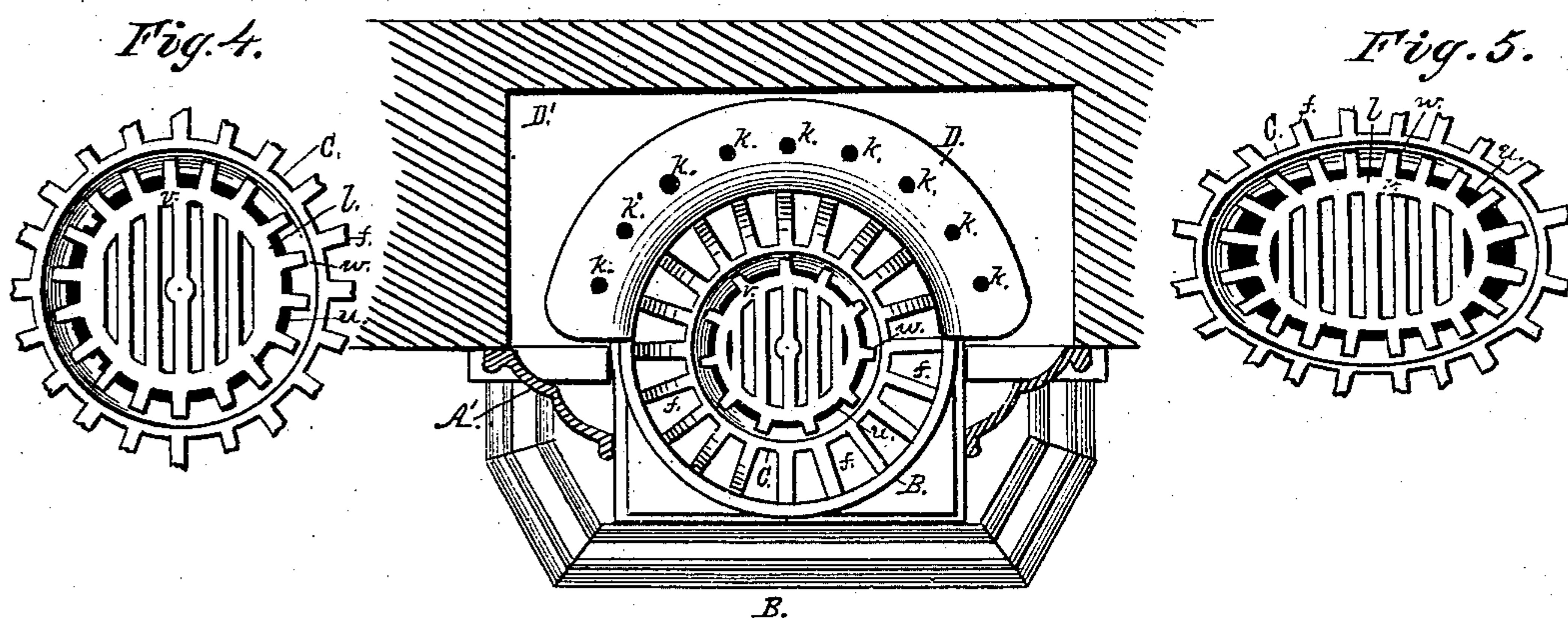
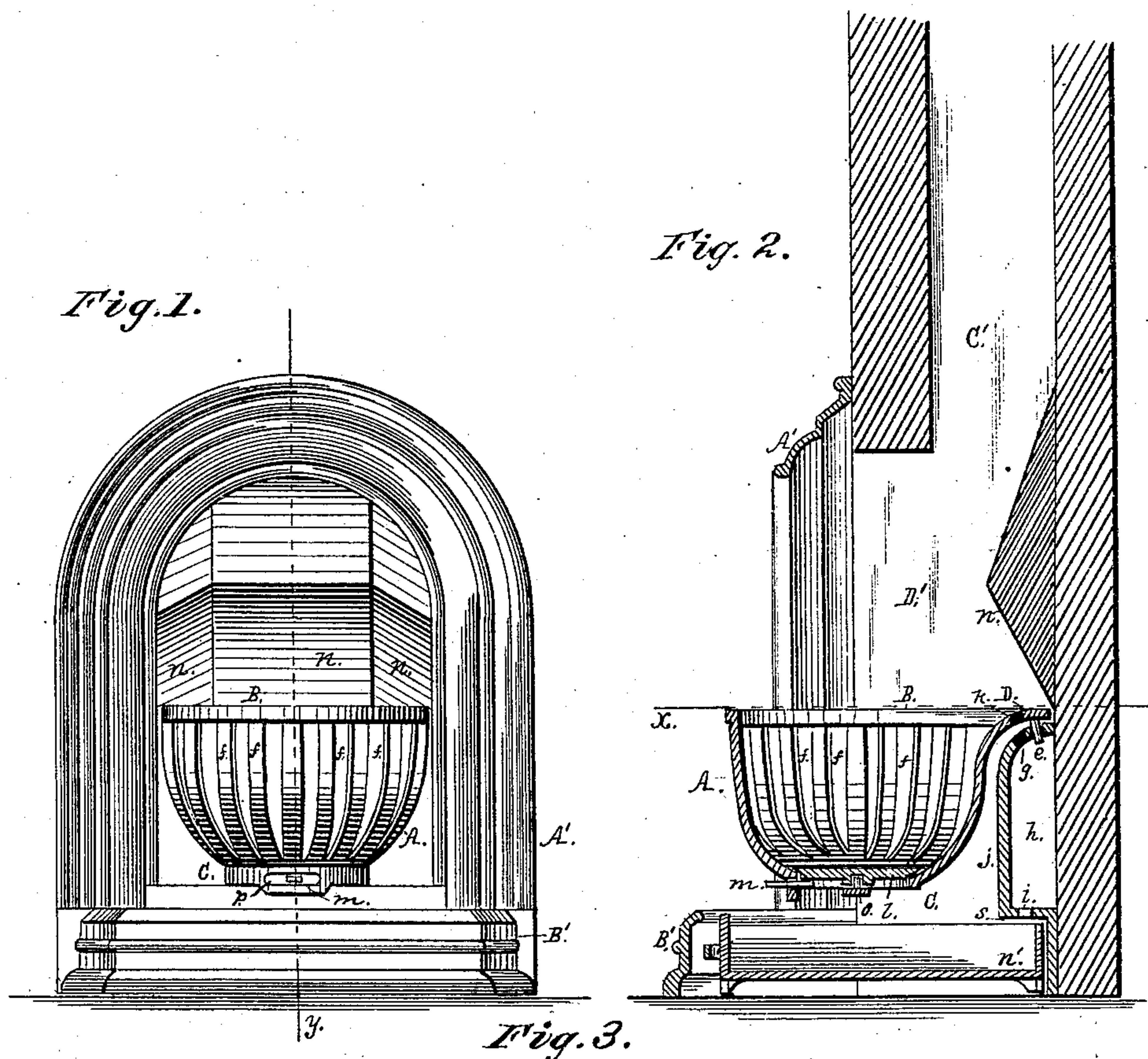


(No Model.)

J. J. JOHNSTON.
Fireplace Grate.

No. 237,750.

Patented Feb. 15, 1881.



WITNESSES

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FIRE-PLACE GRATE.

SPECIFICATION forming part of Letters Patent No. 237,750, dated February 15, 1881.

Application filed April 12, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. JOHNSTON, of Columbiana, in the county of Columbiana and State of Ohio, have invented a certain new and useful Improvement in Grates for Fire-Places; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in grates for fire-places; and it consists of a grate with an upper and lower ring, the former greater in diameter than the latter, and coupled to it through the medium of curved bars radiating from the center of the lower ring, and in which is pivoted a detachable grated bottom, one-half of said upper ring having an outward-projecting flange furnished with a series of perforations which communicate with openings in the crown of an air-chamber in rear of the grate when in position in the fire-place, said grate, with its perforated flange and air-chamber, being so arranged with relation to semi-lozenge-shaped tile (when viewed in cross-section) that the products of combustion are so deflected that they are brought in contact with a large number of jets of highly-heated air issuing from said air-chamber, and up through the apertures of said flange, and commingled with said products, whereby a complete combustion of them and the fuel is effected.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a front elevation of my improvement in grates for fire-places. Fig. 2 is a vertical section of the same at line *y* of Fig. 1. Fig. 3 is a horizontal section of the fire-place at line *x* of Fig. 2. Fig. 4 is a top view or plan of the lower part of my improvement in grates, and Fig. 5 represents a modification in form of the same.

In the accompanying drawings, A represents the grate, which consists of rings B and C, coupled together by bars *f*, for a circular

basket-grate. From the periphery of the ring B projects outward a curved flange, D, through which are a large number of perforations, *k*, and from the under side of said flange projects downward a pin, *e*, which enters an opening in the crown of the air-chamber *h*. The curved flange D rests on the crown of the air-chamber *h*, and the pin *e* is used for holding the grate in place in the fire-place D'. The front wall, *j*, and crown of the air-chamber *h* are constructed of cast-iron, and should be corrugated vertically for the purpose of securing a large surface for heating the air which enters the chamber *h* through a number of openings, *i*. The air-heating chamber *h* and its front wall, *j*, should encircle about one-half of the grate A, as indicated by the curved flange D and the perforations *k*. (Shown in Fig. 3.)

In the center of ring C of the grate A, extending from side to side of said ring, is a bar, *o*, having an upward-projecting pintle, on which the detachable bottom *l* is pivoted, as shown in Fig. 3.

The detachable bottom *l* of the grate A is provided with a large number of radial projections, *w*, projecting from the ring *v* of said bottom, which is placed within the ring C of the grate A, leaving a space between said rings, as indicated in Figs. 3, 4, and 5, and marked *u*. The projections *w* are used for agitators for freeing the lower part of the bars *f* and the spaces between them from ashes and other refuse of combustion, and also serve for agitating the fuel of the fire in the grate A, and resting upon the detachable and pivoted bottom *l*.

From the ring *v* of the bottom *l* projects an arm, *m*, which passes outward through an opening, *p*, in the ring C of the grate A, as shown in Figs. 1 and 2. This arm *m* is used for the purpose of imparting to the bottom *l* a horizontal reciprocating motion, whereby the grate is freed from ashes and the burning fuel in the grate, and, resting upon the bottom, is thoroughly agitated.

By having the bottom *l* detachable it can be readily removed and a new bottom put in place in case of the bottom *l* becoming injured or its bars burning out, and said detachable

bottom is of great advantage when cleaning out the grate A, when it is desirable to dispense with fire in warm weather.

It will be observed that one-half of the grate A projects beyond the front wall of the fire-place D', as shown in Figs. 2 and 3. Therefore it is desirable that the grate-front A' should project, as shown in Figs. 2 and 3, which will prevent the light ashes and smoke from passing out into the room, and said projection of the front A' will give a more ornamental finish to it and the grate. This projecting feature of the front A' and grate A adds greatly to the efficiency of the grate in utilizing the fire for heating the room in which the grate is placed.

In the fire-place D', above the grate A, is arranged "fire-tile" of semi-lozenge form, (when viewed in cross,) as shown at *n* in Figs. 1 and 2. By this arrangement of the tile *n* the volume of smoke and heat passing upward from the grate A is deflected, so that the heated air passing from the chamber *h* through openings *g*, and passing up between the grate A and the metal wall *j*, and passing through the openings *k* in the curved flange D, will commingle with the said smoke and heat, thereby causing it to be consumed, and also causing a complete consumption of the fuel in the grate A, making a clear clean fire, the heat of which is radiated or deflected outward into the room, while the unconsumed gases pass up and out through the flue C'.

Below the air-chamber *h* is a recess, *s*, into which the back end of the ash-pan enters, by which arrangement all the ashes from grate A

is certain to fall within the walls of the pan *n'*, the front end of which is guarded by the fender B', which is of ordinary construction. By constructing the grate A in the form herein- before described the entire side wall of the grate A is utilized for heating, the fire is easily agitated, the grate is freed from ashes with great facility, and a clean bright fire is secured.

When desirable, the grate A may be made oval in form, as indicated in Fig. 5; but in such case the bottom *l* should have a horizontal reciprocating and lateral motion for the purpose of agitating and cleaning.

I am aware that a grate for fire-places having a perforated guard-plate, and also a perforated air-chamber arranged in rear of such grate, are old, and such I do not wish to be understood as claiming, broadly, as of my invention.

Having thus described my improvement, what I claim as of my invention is—

A basket-grate for fire-places, said grate consisting of an upper ring having a perforated curved flange, D, formed therewith, and the lower ring, the former of greater diameter than the latter, and coupled to it through the medium of bars, and furnished with a grate, in combination with air-chamber *h*, having a front metal wall curved at its upper end, and having the openings *g* and *i* and the deflecting-walls *n*, substantially as and for the purpose herein shown and described.

JAMES J. JOHNSTON.

Witnesses:

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