2 Sheets—Sheet 1.

J. OLD.

FIRE-PLACE GRATE.

No. 184,017. Patented Nov. 7, 1876.

Fig. 1.

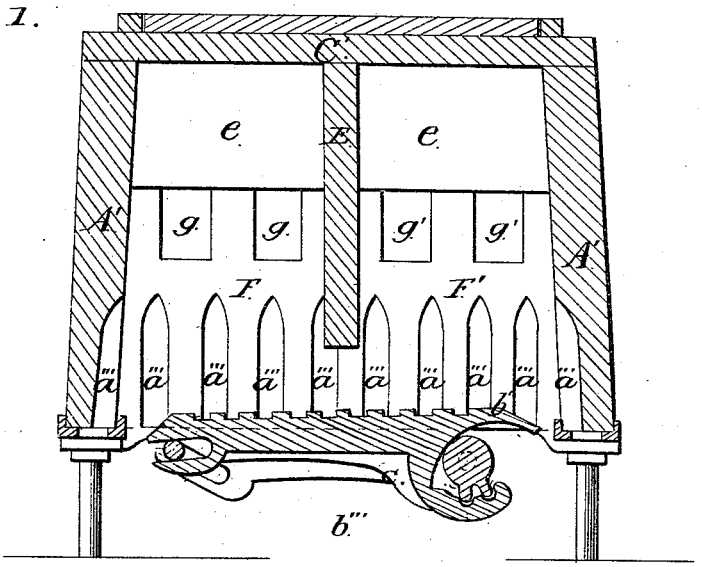


Fig. 2.

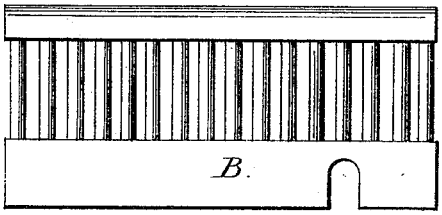
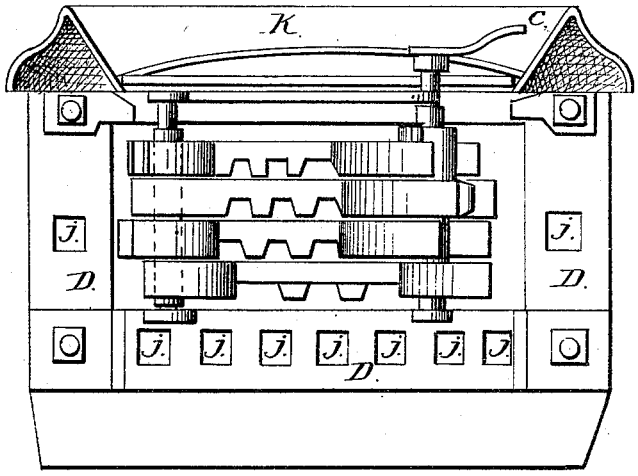


Fig. 3.



WITNESSES

Jas. L. Old
Wm. Dunn

INVENTOR

James Old

2 Sheets—Sheet 2.

J. OLD.

FIRE-PLACE GRATE.

No. 184,017. Patented Nov. 7, 1876.

Fig. 4.

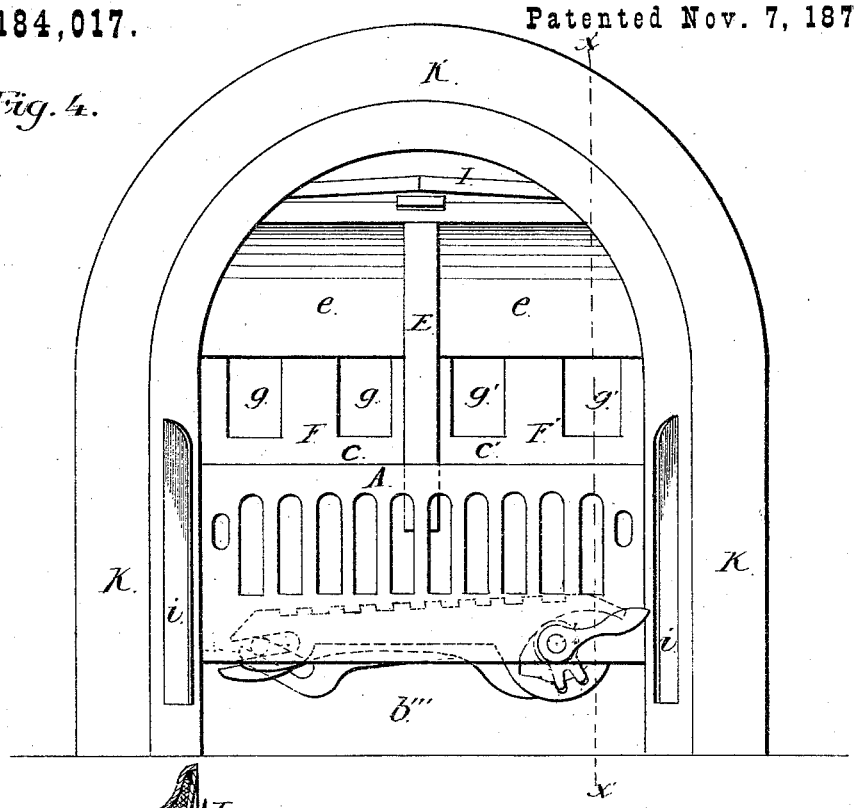
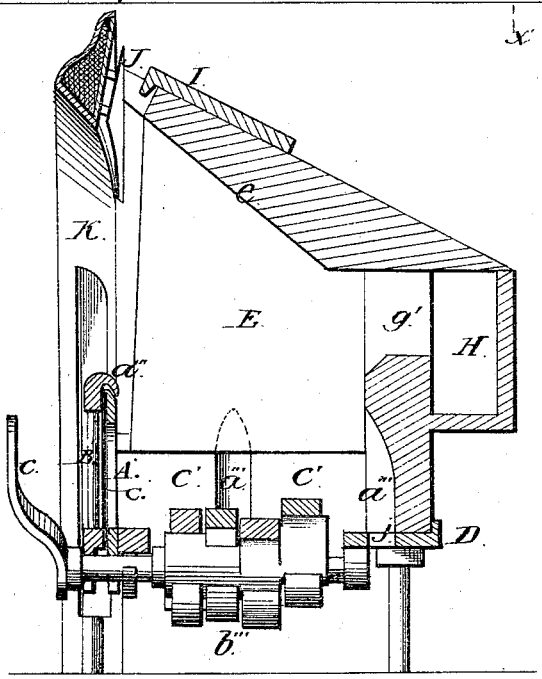
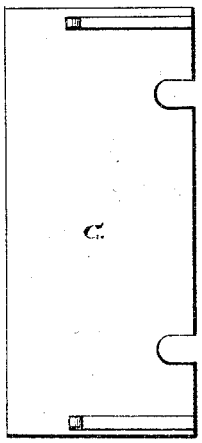


Fig. 5.





WITNESSES

Jas. L. Old
M. C. Dodson

INVENTOR

James Old

UNITED STATES PATENT OFFICE.

JAMES OLD, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN FIRE-PLACE GRATES.

Specification forming part of Letters Patent No. **184,017**, dated November 7, 1876; application filed February 23, 1876.

To all whom it may concern:

Be it known that I, JAMES OLD, of the city of Allegheny, county of Allegheny, and State of Pennsylvania, have invented certain Improvements in Grates, &c., of which the following is a specification:

The first part of this invention relates to an improvement in the construction of fronts for grate-baskets; and it consists of a front composed of two or three parts, the inner one of which is the front of the basket proper, while the outer one forms an ornamental front, and the middle one serves as a protection for the ornamental front, and can also be used as damper.

The second part of the invention relates to improvements in the construction of fire-places and stoves; the objects of which are, to economize the consumption of fuel by causing a more perfect combustion thereof, and also by effecting the combustion (more or less entire) of the gases and smoke arising from the burning fuel; and, further, to reduce the loss of heat occasioned by the escape thereof up the chimney.

In the drawings forming part of this specification, Figure 1 is a longitudinal section of a fire-place. Fig. 2 is the ornamental front of the grate. Fig. 3 is a bottom plan of the fire-place. Fig. 4 is a front elevation of the fire-place; and Fig. 5 is a vertical cross-section of the fire-place.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A represents the inner front of the grate-basket, constructed in the usual manner. B is the ornamental or outer front, and C is the middle plate. The front B may be made of any highly-polished metal, cold-rolled iron; or it may be made of iron or other metal, and plated. The front B is provided with a lip, a'', by means of which it is hung on the front A, as shown in Fig. 2. If desirable, however, it may be provided with hooks, and hung to the front of the fire-place. The fuel and fire are prevented from coming in contact with the ornamental front by the inner front A, and thus it is preserved from injury or defacement; and thus a handsome material may be used, and a highly-ornamental appearance be given to the grate. As a further protection to the ornamental front, the middle plate C may be used. It is placed between the fronts A B, and is made of thin sheet metal, perforated, or not, as may be desired. In addition to its affording protection to the ornamental front, the middle plate may be used as a regulator for the draft, and it may be arranged to slide to the right or left, by dividing it vertically in the center, and confining it in suitable ways. In connection with a grate-basket of this description I make use of a summer front for the fire-place. This summer front is used to cover the open fire-place above the grate-basket, and is placed in position after the removal of the outer ornamental front. It is supported by flanges on its inner side, which rest on the bars of the inner front, while the ornamental front is hung to supports affixed to the outer side of the summer front. The unsightliness of the ordinary fire-place is thus got rid of, and in place of it a fire-place and grate are obtained which are highly ornamental and tasteful.

A′ A′ are the side walls of the fire-place. B‴ is the rear wall. C‴ is the top, and D is the frame or foundation, on which the walls rest. The side and rear walls are of fire-brick or metal, and they are provided with the vertical air-ducts a''' a''', &c., which lead from the ash-pit (represented by b''') to the fire-chamber c'. Through these ducts air is conducted from the ash-pit to the body of the fuel on the sides and rear, and thus a draft is caused to reach every part of the fire, and the result is, that accumulations of unburned fuel on the grate are prevented. Another advantage of these ducts is, that a draft of air heated to a moderate degree is delivered from them above the fuel, and injected into the gases and smoke arising from the fire, supporting their combustion in the heat-chambers presently described. E is the partition-wall, supported in front on the grate-basket, and at the back by legs, or by a recess in the rear wall of the fire-chamber. This partition divides the fire-chamber into two parts, F F′, and it reaches from the deflecting-tile e as far down below the fuel-level as may be necessary. It is arranged so as to be readily removed when desired, or for the purpose of converting the double fire-chamber into one.

A sliding door supported by flanges on the front of the grate-basket, and extending from the deflecting tile nearly to the hearth, and sufficiently wide to cover one of the chambers F F′ is used for the purpose of closing one of the fire-chambers. It is arranged to slide to the right and left, and covers the fire-chambers like a blower.

H is a heat-chamber, situated back of the fire-chamber, and extending the whole length thereof. It communicates with the fire-chamber F F′ through openings *g g′*, &c. The fire heats the chamber H to a high degree, so that smoke and gaseous products of combustion passing through it are consumed by the intense heat to which they are subjected.

The effect is produced by the following arrangement: When the fire-chamber F is closed, by the sliding door or blower before mentioned, the direct draft of this chamber to the chimney is cut off, while the draft of the chamber F′ is left open. The draft of the chamber F is then turned through the heat-chamber H, passing through the openings *g*, and after traversing the heat-chamber emerge through the openings *g′* into the open fire-chamber F′. The products of combustion are thus caused to pass from the chamber F through the heat-chamber, and thus the gases and smoke are almost if not entirely consumed. A supply of air, to mix with the smoke and gases, is conveyed by the ducts *a‴*, or from openings in the partition-wall E.

In addition to the advantage derived from the arrangement herein described, as a mode of effecting the combustion of the smoke and gases, are the additional ones of furnishing greater radiating and reflecting surface, enabling heat, from the open fire-place, to be used in a room or apartment above by placing a coil of pipe in the heat-chamber to supply heated air above in the usual manner; also, enabling the fires in the two chambers to be properly regulated.

In the construction of the heat-chamber H it may be either single or double, and it may be subdivided into several zigzag flues to give greater length to the draft from the closed chamber; or it may be constructed in Flemish course, or with bridges to interrupt the direct course of the draft, and expose the gases and smoke to the large extent of brightly-heated walls, &c.

I is a damper resting on the deflecting-tile *e*, which can be moved backward and forward by a flange on its front edge.

By means of this damper the opening to the chimney-flue can be contracted or expanded, according as it is desired to have a strong or weak draft, and thus the escape of heat up the chimney can be regulated. It also serves to close the opening when there is no fire to prevent soot, dust, &c., from falling on the hearth.

J is a plate, secured to the inner side of the arch of the front K, which protects the front immediately over the fire, where it is most exposed to the heat, and thus preserves the enamel from cracking. Between the plate and the front is an air-space.

Mirrors *i* are placed in the front K, either on the sides or in the arch, as may be desired. Polished mica plates may be substituted for the glass mirrors.

The frame D is made of cast-iron in separate pieces, or in a single casting. It is supplied with openings *j*, corresponding in number and position with the air-ducts *a‴*, thus enabling the air to pass into the ducts without interruption. The frame serves as the foundation of the fire-places. It has flanges cast on its upper sides, and the walls are built up from it, being held firmly in position without any liability to become displaced by the sinking of the surrounding walls, or from other causes. The arrangemements for fire-places herein described are equally applicable to stoves.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A grate-basket, the front of which is composed of the parts A B, the outer one of which is made of cold-rolled iron or any polished or plated metal of an ornamental character, substantially as and for the purpose described.

2. In combination with the fronts A B, the middle plate C, substantially as and for the purpose described.

3. The air-passages *a a*, &c., in the side and rear walls of the fire-place, in combination with the double fire-chambers F F′, the openings *g g′*, and the heat-chamber H, substantially as described.

4. The heat-chamber H, in combination with the fire-chambers F F′, communicating with each other through the medium of the openings *g g′*, substantially as described.

5. The division or partition wall E, in combination with the heat-chamber H and a sliding door or blower, substantially as described.

6. The frame D, provided with openings *j*, in combination with the side and rear walls of the fire-place and the air-passages *a‴ a‴*, substantially as described.

JAMES OLD.

Witnesses:
SAMUEL ANDERSON,
HARRY C. OLD.