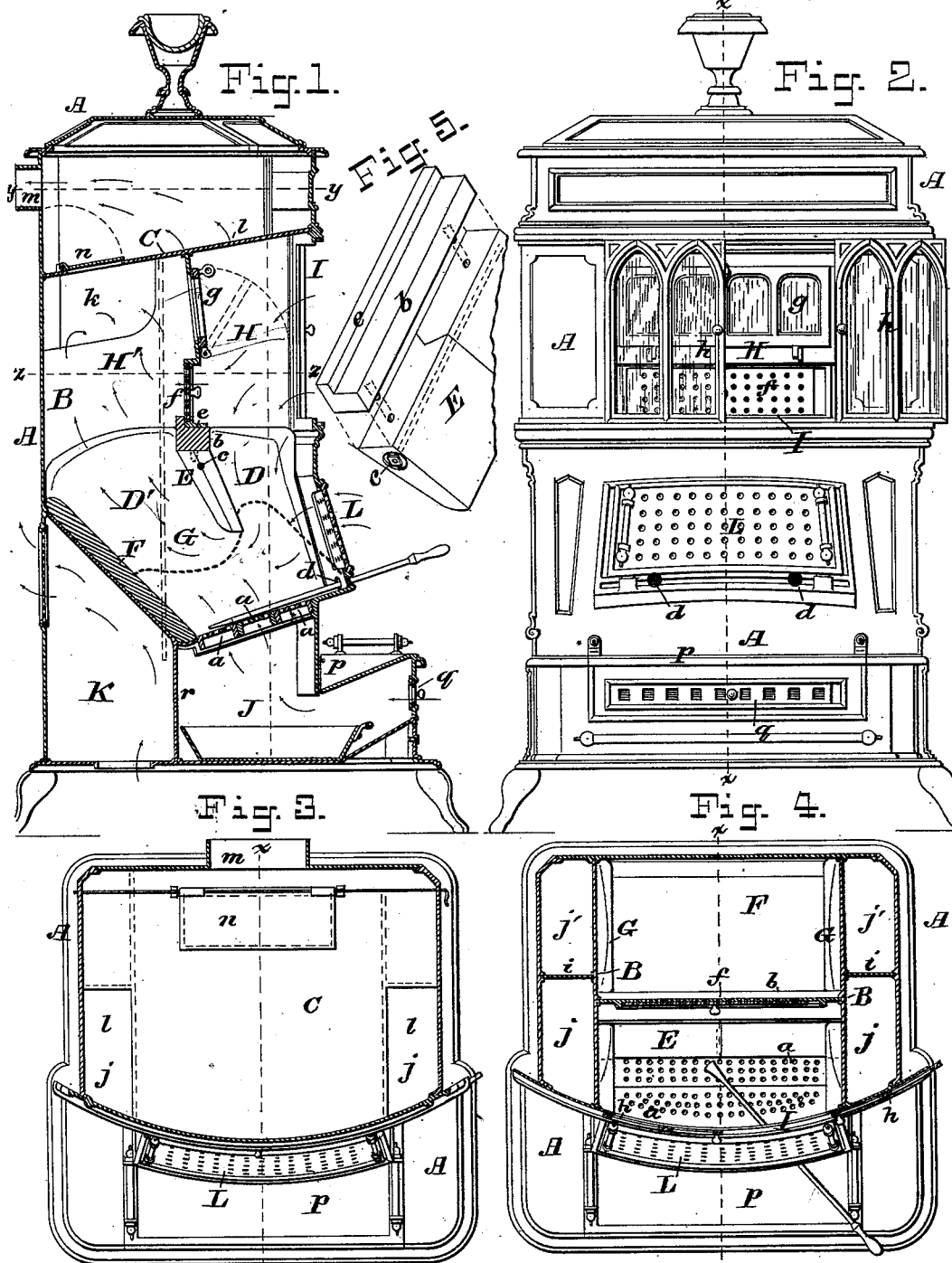


W. A. GREENE.
Parlor Stove and Heater.

No. 214,906.

Patented April 29, 1879.



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UNITED STATES PATENT OFFICE.

WILLIAM A. GREENE, OF ELIZABETHPORT, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO EDWIN R. CAHOONE AND ANDREW ALBRIGHT, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN PARLOR STOVES AND HEATERS.

Specification forming part of Letters Patent No. **214,906**, dated April 29, 1879; application filed December 10, 1878.

To all whom it may concern:

Be it known that I, WILLIAM A. GREENE, of Elizabethport, in the county of Union and State of New Jersey, have invented certain Improvements in Parlor Stoves and Heaters, of which the following is a specification.

This invention relates to stoves for heating purposes, adapted for burning bituminous coal or those fuels that are rich in hydrocarbons, the object being to prevent, as far as possible, the formation of smoke and the collection of soot in the flues and passages, as well as to prevent the escape of the same into the rooms.

Heretofore, with many stoves, grates, and heaters for warming rooms, the burning of bituminous or soft coal has been attended with such disagreeable consequences, arising from the escape of smoke or soot into the room at every puff of air, and the collection of soot upon the mica, in the flues, and upon other parts, that its disadvantages have outweighed the advantages of cheapness (in many localities) and its cheerfulness and eminent heating qualities, which would render it a universal favorite.

To mitigate these disadvantages, and to provide a parlor or heating stove that will combine cleanliness and economy with an open fire, is the object of my present invention, which I will now describe.

In the drawings which illustrate my invention, Figure 1 is a vertical section of my heating-stove, taken in the plane of the line *x x* in the several figures. Fig. 2 is a front elevation of the same. Fig. 3 is a horizontal section of the stove, taken in the plane indicated by the line *y y*, Fig. 1. Fig. 4 is a horizontal section of the stove, taken in the plane of the line *z z*, Fig. 1. Fig. 5 is a perspective view of the pendent partition.

Let A represent the body or outer shell of the stove, which may be of any suitable design or contour. In the present case the invention is shown as adapted to a stove with a swelled or rounded front; but this is not essential. The sides and top of the stove have double walls, with an air or flue space between them.

B represents the inner side walls, and C the inner or lower roof-plate over the combustion-chamber. The fire-box is divided, in some degree, into two parts, D D', by a pendent partition, E. (Shown in detail in Fig. 5.) The bottom of the fire-box is composed of removable perforated sections *a a*, arranged to slant back from the front of the stove to a back plate, F, which slopes up to the back wall of the stove, forming an angle with the bottom of the fire-box, as shown. This back plate and the side linings G are made of fire-clay, soap-stone, or any suitable refractory material. The partition E has bearings in sockets in the side linings, and slants toward the front of the stove, occupying about one-half the depth of the fire-box.

In Fig. 5 I have shown the preferred method of constructing the partition E. It is made of steatite, soap-stone, or other suitable refractory material, in three pieces, the top bar, *b*, extending across the fire-box, and doweled to the lower portion, as shown. The lower part is cut in two about midway of its length, the halves being held together by a long bolt or rod, *c*, with a head on one end and a nut on the other. This rod extends entirely through the two parts.

As both ends of the partition are housed in the refractory side linings G, it will be seen that the bolt or rod *c* is protected in all its parts from the direct heat of the fire.

To prevent the flames from passing through the joint or joints between the pieces, whereby the metal rod or bolt might be injured, and to prevent the pieces from slipping past each other, I prefer to provide them with V-joints, as shown in Fig. 5. Other forms of interlocking joints may, however, be employed.

The lower part may be formed from three or more pieces; but I prefer two for a stove of ordinary size. The object of cutting the lower portion of this partition into two or more pieces is to allow for expansion and contraction, as it is liable to break from the action of these forces if made in one piece. It may also be made cheaper from smaller pieces.

In the front of the fire-box is a perforated removable plate, L, and below this are arranged

holes *d d*, for the insertion of the poker in slicing the fire and stirring down the ashes. The holes *d d* are arranged just above the level of the fire-bed *a a*, and this bed presents a smooth and level surface for the poker to play over in arranging the fuel, as will be more fully set forth farther on.

Above the fire-box is the combustion-chamber, which is divided, like the former, into two parts, *H H'*. The partition which divides this chamber rests in a rabbet or channel, *e*, in the partition *E*, and is provided, first, with a register, *f*, for the regulated admission of air in small quantities from the primary to the secondary combustion-chamber; and, secondly, with a door or plate, *g*, with mica panes, arranged for the double purpose of illumination and to provide access to the chamber *H'* from the front. This door or plate may be hinged, or be constructed so as to be removed entirely, as desired.

I is the charging door or opening, which I prefer to provide with double sliding doors *h h*, having mica panes for illumination. The spaces between the inner and outer side walls on each side are divided by vertically-arranged partitions *ii* into front and back flues, *j j'*, and openings *k k* in the inner walls, *B*, just below the sloping roof-plates *C*, permit the products of combustion to enter the back flues. They pass down these flues under the lower edges of the partitions, which stop short of the bottom, up the front flues, and out at openings *l l* in the plate *C*. From thence they pass to the exhaust at the pipe-collar *m*.

At *n* is shown a damper, arranged to close an opening in the plate *C*. This damper may be operated by means of a handle, *o*, in the usual way.

When starting the fire, or when otherwise desired, the damper *n* may be raised, so as to permit the gaseous products to reach the exhaust without following a circuitous course through the flues, and thus increase the draft temporarily.

J is the ash box or pit, which may contain a removable pan, as shown. This pit is covered by a sloping apron, *p*, arranged to overhang the front, and provided with an adjustable air-register, *q*. The ash-box does not extend to the back of the stove, but is stopped at the partition *r*, and back of this is a radiating-chamber, *K*. The air may enter this chamber from the bottom, and pass out at perforations or lattice-work at the back.

Having thus described the construction of my improved stove, I will now describe its operation: The fire is started under the pendent partition *E*, and the fuel, usually bituminous or soft coal, is fed into the primary or front fire-box, *D*, at the opening *I*. It takes fire at the back first, and as the temperature increases it becomes charred or coked, losing its hydrogen and free carbon. When sufficiently coked it is pushed back, wholly or partially, into the secondary fire-box, *D'*, by means of a poker thrust through the holes *d d* in the front.

The fire-bed being formed of perforated sections instead of grates, the fire must be stirred and sliced from above, the air being admitted through the perforations in small jets, evenly distributed over the entire surface of the bed, which is unusually large.

Soft coal cakes in coking, and to break up this mass the poker is inserted at the holes, as above stated, under the mass, and the wall of the hole used as a fulcrum for prying and breaking it up.

The sloping arrangement of the fire-bed and its smooth upper surface greatly facilitate the operation of pushing the fuel back under the partition *E*.

In the secondary fire-box the coal combines with the constantly-incoming current of air through the perforations in the fire-bed and becomes incandescent, its fixed carbon combining with the oxygen without smoke, or with very little smoke. In the meantime green or uncoked fuel is fed in at the charging-door, as needed, to supply the place of the coked coal pushed forward.

By reason of the pendent partition *E* and the partition superimposed thereon, which divides the combustion-chamber, the draft is invariably downward from the charging-door, so that no smoke will rise in the primary fuel and combustion chambers, while the hydrocarbons set free in coking are compelled to pass under the partition and through the incandescent mass in the supplementary or back fire-box. In this they are combined with the oxygen before they can reach the flues or the exhaust. Thus substances of which the visible parts of the smoke are composed are all combined and pass off as invisible products of combustion.

It will be seen that the products of combustion, mixed with more or less of the uncombined gases from the fuel, rises vertically in the secondary combustion-chamber to reach the flues. To secure perfect combustion therein air in small quantities may be admitted through the register *f* just above the pendent partition. This will consume the gases and produce a good degree of illumination in the back chamber, which may be seen through the mica panes in the door or plate *g*, and adds to the cheerfulness of the fire.

As before stated, the products of combustion may at times pass directly to the exhaust through the dampered opening *n*; but ordinarily this damper will be closed, and they will pass through the openings *k k* into the rear side flues, thence down and under the flue-partitions, up the front flues, and through the openings *l l* to the exhaust, as indicated by the arrows.

The openings *k k* being arranged adjacent to the back wall of the stove, the gases are led away from the door or plate *g*, and the mica panes therein are thus kept free of contamination by soot or dust carried up by the draft.

It will be observed that no means of communication exists between the combustion

chambers above the register *f*, except by way of the door *g*, and this is kept closed while the fire is going. Consequently no smoke will arise in the primary combustion-chamber from the green fuel, and the mica in the doors *h h*, as well as that in the door or plate *g*, will be kept clean and untarnished. Moreover, the flues *j j'* will not be clogged up with soot, as in flues of stoves where soft coal is burned in the usual way.

The doors *h h* are ordinarily left open, so as to present an open fire; but when closed they serve as a blower, the air entering wholly at the register under the apron and through the perforated plate *L*. This last-named plate may be hinged to the stove or be entirely removable. It enables the fire-box to be got at and cleaned of clinkers, and permits the more ready removal of the sections of the fire-bed, should they need renewal.

I claim—

1. In a stove for burning bituminous or soft coal, and designed for heating purposes, the arrangement of a fire-box divided by a pendent partition, *E*, into two parts, *D D'*, and a combustion-chamber divided into two parts by a partition superimposed upon the partition *E*, as shown, and provided with an air-register, *f*, above the partition *E*, to admit air to the rear combustion-chamber, substantially as set forth.

2. In a heating-stove for burning bituminous or soft coal, the arrangement of the double fire-box *D D'* and double combustion-chamber *H H'*, with the partition between the front and back combustion-chambers, provided with panes of mica for illumination, substantially as set forth.

3. In a heating-stove for burning soft coal, having its combustion-chamber and fire-box divided into two parts by a cross-partition, the arrangement in said partition of mica-covered openings opposite the charging-door, and an air-register, *f*, below the same, and flue-openings *k k* at or near the back wall of the stove to lead the products of combustion away from the mica in the partition, substantially as set forth.

4. In a heating-stove for burning soft coal,

the pendent partition *E*, arranged to divide, or partially divide, the fire-box, the superincumbent partition extending from the partition *E* to the top of the stove, and provided with an air-register and mica panes; with the main walls or shell of the stove, and the side flues *j j'*, provided with inlets and outlets *k l*, all combined and arranged substantially as set forth.

5. The combination, in a heating-stove adapted for burning soft coal, of a pendent partition, *E*, refractory side walls *G*, perforated front plate, *L*, sloping refractory back plate, *F*, and sloping sectional perforated plates *a a*, all arranged to form a double fire-box, *D D'*, and the superimposed partition, provided with mica panes *g* and register *f*, substantially as specified.

6. The combination, in a heating-stove for soft coal, of the pendent partition *E*, having a groove or rabbet, *e*, along its upper edge, and the superincumbent partition resting therein and provided with mica-covered openings, substantially as specified.

7. In a parlor or heating stove provided with refractory side linings, a pendent partition, *E*, of soap-stone or other refractory non-metallic material, constructed of one cross-piece, *b*, of said material, and two or more pieces pendent therefrom, doweled thereto, and jointed together, the whole having its ends housed in the side linings, substantially as shown and specified.

8. In a stove, a pendent partition, *E*, composed of pieces of soap-stone or other non-metallic refractory material, fitted together with *V*-joints or their substantial equivalents, and held together by a metal rod or bolt, *c*, which passes through all the pendent pieces edge-wise, so as to be protected from the direct heat of the fire, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM A. GREENE.

Witnesses:

ARTHUR C. FRASER,
C. SEDGWICK.