2 Sheets—Sheet 1.

F. L. HOLMES.

Stove and Furnace Grate.

No. 197,634. **Patented Nov. 27, 1877.**

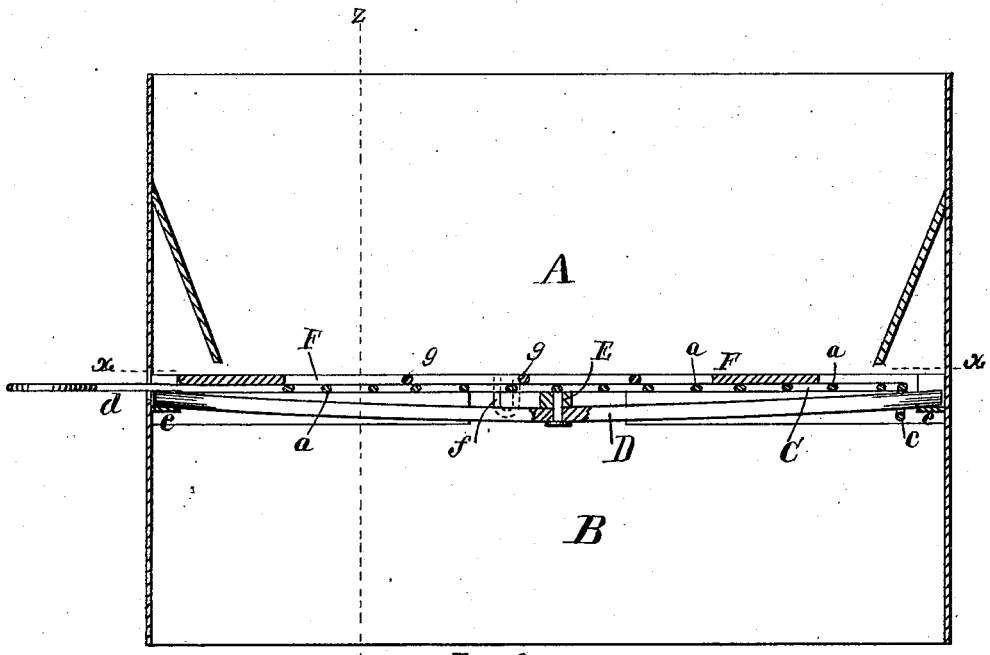

FIG. 2.

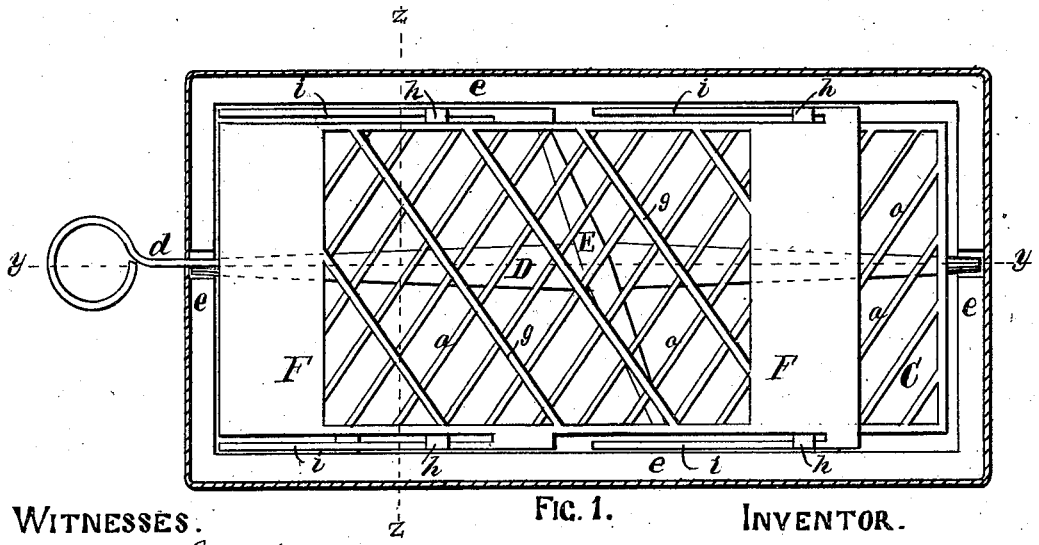

FIG. 1.

WITNESSES.

N. W. Lombard,

Benj. Andrews. Jr.,

INVENTOR.

Fred L. Holmes.

F. L. HOLMES.

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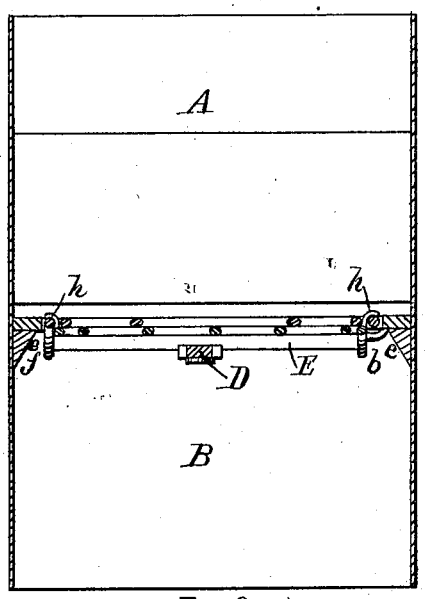

FIG. 3.

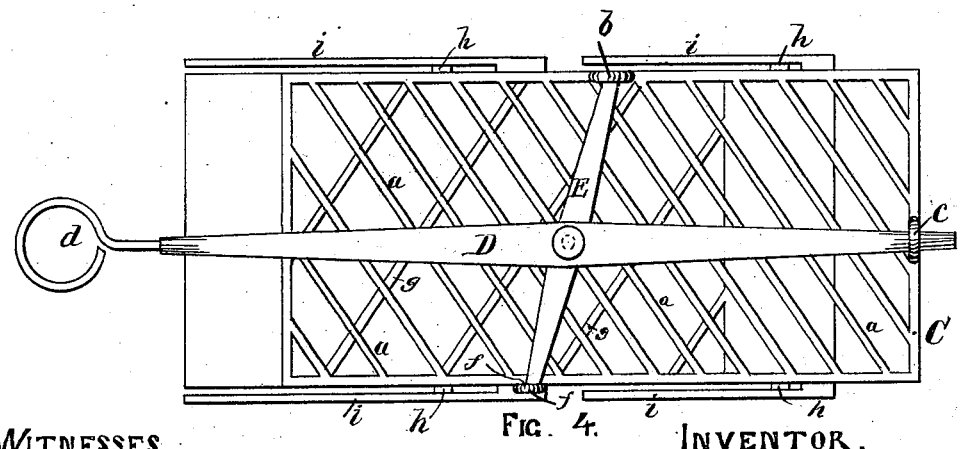

FIG. 4.

WITNESSES.

N. C. Lombard,

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UNITED STATES PATENT OFFICE.

FRED L. HOLMES, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN STOVE AND FURNACE GRATES.

Specification forming part of Letters Patent No. **197,634**, dated November 27, 1877; application filed October 10, 1877.

To all whom it may concern:

Be it known that I, FRED L. HOLMES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Grates for Stoves, Furnaces, or other heating apparatus, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to the construction and application of stove or furnace grates, and is designed to facilitate the separation of the ashes from the burning or partially burned coal; and it consists in the use, in combination with the fire and ash pots of a stove, furnace, boiler, or other heating apparatus, of two grates placed one above and in close proximity to the other, and adapted to be reciprocated in opposite directions at the same time, as will be described.

My invention further consists in the use, in combination with the fire and ash pots of a heating apparatus, of two grates placed one directly above and in contact with the other, and adapted to be reciprocated in opposite directions at the same time, said grates being each made up of a series of alternate openings and bars extending diagonally across the same from side to side, and so arranged relative to each other that the bars and openings in one grate shall cross the bars and openings of the other grate.

My invention further consists in the use, in combination with the fire and ash pots of a heating apparatus, of two grates placed one above the other, and in contact, or nearly so, therewith, and each connected to a lever pivoted at the center of its length in such a manner that an endwise movement of one of said grates will cause a corresponding movement of the other grate, but in an opposite direction.

My invention further consists in the use, in combination with the fire and ash pots of a heating apparatus, of two grates placed one above the other, and in contact, or nearly so, with each other, and adapted to be reciprocated in opposite directions at the same time, and also adapted to be rotated about an axis parallel with their line of reciprocation, so that, after the ashes have been sifted out of the coal by the reciprocations of the grates, the coal remaining upon said grates may be dumped into the chamber below the grates, if desired.

Figure 1 of the drawings is a section through the fire or ash pot of a cook-stove, and showing my improved grate in plan, the cutting-plane being on line *x x* on Fig. 2. Fig. 2 is a vertical section on line *y y* on Fig. 1. Fig. 3 is a transverse vertical section on line *z z* on Figs. 1 and 2, and Fig. 4 is an inverted plan of the double grates removed from the stove.

A is the fire-pot or ash-pot of an ordinary cook-stove, according as to whether my improved grate is applied as a fire-grate or a sifting-grate placed below the fire-grate. B is the ash pot or chamber, into which the ashes fall as they pass through the grate. C is the main grate, consisting of a rectangular frame, having a series of bars, *a*, extending obliquely from side to side thereof at equal distances from each other, as shown, and provided with the downwardly-projecting loops or eyes *b* and *c*, and with the operating rod *d*, which projects through the wall of the stove, and serves as a means of imparting a reciprocating endwise motion to said grate.

D is a bar extending longitudinally across the ash-pot B, and supported at its ends in bearings formed for the purpose in the ledge *e* in such a manner that it may be rotated therein, when desired. The bar D has pivoted to its upper side, near the middle of its length, the lever E, which, extending transversely across the ash-pot, engages at one end with the loop or eye *b*, which projects downward from the side bar of the grate C, and at the other end with a corresponding loop or eye, *f*, formed upon and projecting downward from the opposite side rail of the grate F.

The grate C is kept in proper position laterally by the loop or eye *c*, which surrounds or embraces the bar D near one end, and at the other end by the rod *d* passing through the wall of the stove or furnace.

F is a secondary grate, made in substantially the same manner as the grate C, except that its diagonal bars *g* are so arranged that when the two grates are placed one upon the other

they will cross the bars *a* of the grate C, as clearly shown in Figs. 1 and 4. The grate F rests directly upon the upper surface of the grate C, and is secured thereto by the hooks *h h*, projecting upward from the grate C, and embracing the side bars or rods *i i* in such a manner that the two grates may be free to move endwise in opposite directions, but cannot be separated from each other while in position in the stove or furnace, or in the act of rotating said grates to dump the coal or cinders resting thereon, which may be done when both of said grates are in a central position, or in such a position that the ends of said grates coincide with each other.

A great advantage is obtained by the use of the double reciprocating grate over a single reciprocating grate, inasmuch as the secondary grate serves as a clearer for the main grate, and prevents it from becoming clogged with clinkers.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the fire and ash pots of a heating apparatus, of two grates, placed one above and in contact, or nearly so, with the other, and adapted, in the manner described, to be reciprocated in opposite directions at the same time, substantially as and for the purposes described.

2. In combination with the fire and ash pots of a heating apparatus, two grates, placed one above the other, and in contact, or nearly so, therewith, each of said grates being provided with a series of bars extending obliquely across the same from side to side, with the bars of one grate crossing the bars in the other grate, and adapted, in the manner described, to be reciprocated in opposite directions at the same time, substantially as described.

3. In combination with the fire and ash pots of a heating apparatus, the grates C and F, bar D, pivoted lever E, adapted to engage at its opposite ends with each of said grates, and the operating-rod *d*, formed upon or connected to one of said grates, all arranged and adapted to operate substantially as and for the purposes described.

4. In combination with the fire and ash pots of a heating apparatus, the two grates C and F, the pivoted lever E, connected at one end with the grate C, and at the other end with grate F, and the operating-rod *d*, formed upon or secured to one of said grates, all arranged and adapted to operate substantially as and for the purposes described.

Executed at Boston, Massachusetts, this 8th day of October, A. D. 1877.

FRED L. HOLMES.

Witnesses:

N. C. LOMBARD,

BENJ. ANDREWS, Jr.