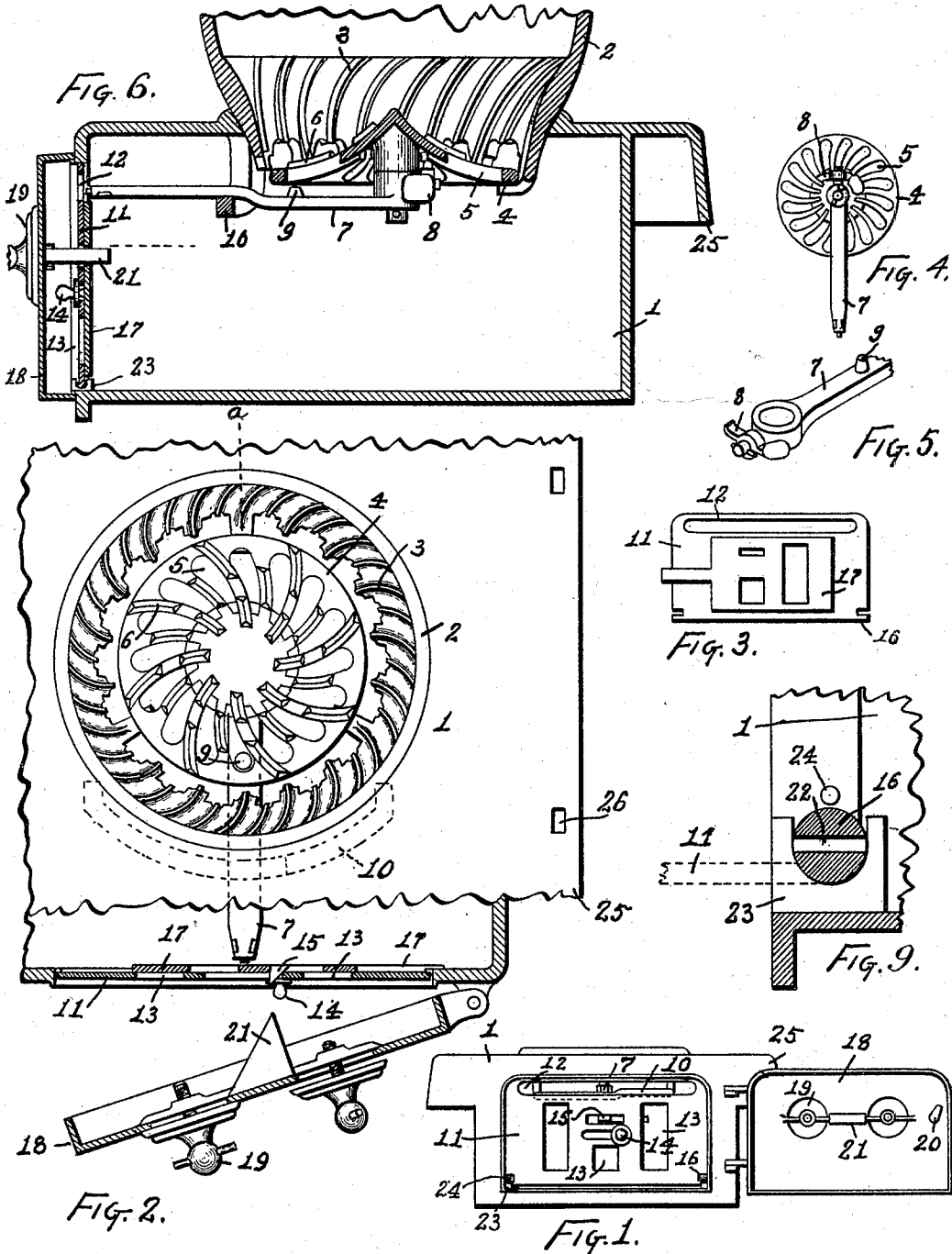


F. A. KIEFER, L. KAHN & H. OSTERBERGER.
STOVE.

No. 585,677.

Patented July 6, 1897.



Witnesses:
E. R. Shipley,
M. S. Belden.

Frank Kiefer
Sagard Kahn
Henry Osterberger
by James W. See Attorney

(No Model.)

2 Sheets—Sheet 2.

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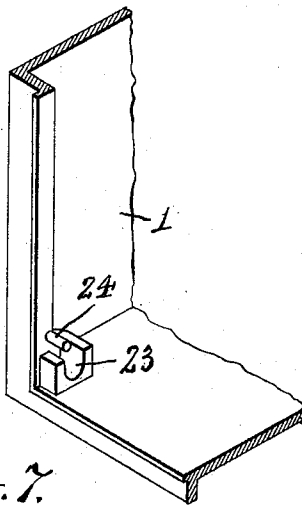


FIG. 7.

Witnesses:
E. R. Shipley.
M. S. Bibben.

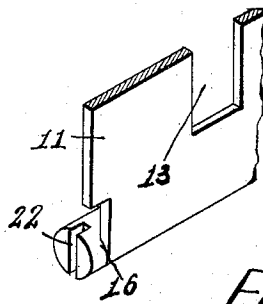


FIG. 8.

Frank Kiefer
Seyard Kahn
Henry Osterberger
Inventors
by *James W. See*
Attorney

UNITED STATES PATENT OFFICE.

FRANK A. KIEFER, LAZARD KAHN, AND HENRY OSTERBERGER, OF HAMILTON, OHIO, ASSIGNORS TO F. & L. KAHN & BROS., OF SAME PLACE.

STOVE.

SPECIFICATION forming part of Letters Patent No. 585,677, dated July 6, 1897.

Application filed June 27, 1895. Serial No. 554,205. (No model.)

To all whom it may concern:

Be it known that we, FRANK A. KIEFER, LAZARD KAHN, and HENRY OSTERBERGER, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Stoves, of which the following is a specification.

In modern heating-stoves the tendency is toward ash-pits which can be made perfectly air-tight. This precludes the presence of openings through which the shake-bar of the grate may protrude, and as a consequence the ash-pit door must be open when the grate is to be shaken. This is objectionable in that it lets ashes out into the room too freely. In our improved construction we provide a most efficient form of rotary and shaking grate operated by an interior shake-bar when the ash-pit door is open, an inner door being provided to retain the ashes, this inner door being a drop-door and forming a hearth when the ash-pan is to be removed.

Our invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of the base portion of a stove exemplifying our improvements, the ash-pit door being open to permit of the working of the grate; Fig. 2, a plan of the same broken away in parts and having some of the parts in section; Fig. 3, an elevation of the inside face of the inner door, which door will be termed the "guard-door;" Fig. 4, a bottom view of the grate and its shake-bar; Fig. 5, a perspective view of the shake-bar; Fig. 6, a section of the base portion and grate, the fire-pot appearing in vertical section in the plane of line *a* of Fig. 2; Figs. 7 and 8, perspective views of the guard-door hinge parts. Fig. 9 is a detail perspective of the guard-door partly broken away.

In the drawings, 1 indicates the ash pit or box; 2, the fire-pot, either integral or lined, seated, as usual, in the top opening thereof; 3, substantially vertical ribs upon the interior surface of the fire-pot, these ribs being arranged spirally, so that as clinker, &c., moves downward along the wall of the fire-pot it advances circumferentially and, conversely, circumferential motion of the clinker in a

certain direction will tend to lift the clinker along the ribs; 4, a circular grate supported in the base of the fire-pot, its periphery not reaching quite to the base of the wall of the fire-pot, whereby an annular escape-opening is left around the grate, the base of the fire-pot forming the outer margin for this annular opening, being roughened or toothed, the upper surface of the grate having a conical form, so that the tendency of clinker and ashes resting upon the grate is to move outwardly toward the annular discharge-opening; 5, substantially radial perforations through the grate, extending from near the periphery of the grate inwardly, leaving the central portion of the grate, however, unperforated; 6, ribs projecting from the upper surface of the grate and extending from near the center outwardly to the periphery of the grate, these ribs having spiral form, with the direction of spirality opposite that of the ribs 3 in the fire-pot, so that as the grate turns in a certain direction (with the sun in the exemplification) ribs 6 tend to move the clinker outwardly, as well as circumferentially, and this direction of motion of the clinker causes it to tend to rise along ribs 3 in the fire-pot; 7, a shake-bar mounted on a pivot under the center of the grate and projecting forwardly to near the front of the ash-box, where its outer end can be engaged by a shake-handle; 8, a pawl pivoted to the shake-bar and disposed under the unperforated central portion of the grate, the toe of the pawl being adapted to engage the ribs formed between the perforations of the grate, the pawl being counterbalanced, so that the toe tends to engage the ribs; 9, a spur on the upper surface of the shake-bar adapted to engage in one of the perforations 5 in the grate if the shake-bar be lifted somewhat; 10, a guide-bar supported in the ash-box under the forward portion of the shake-bar and serving to support the shake-bar normally at such height that spur 9 will be free from engagement with the grate, this guide-bar having at its right an elevated portion which when engaged by the shake-bar will hold the shake-bar in such elevated position that spur 9 will engage the grate; 11, a guard-door at the front opening of the ash-box and connected with the ash-box by base-

hinges 16, so that the door becomes a drop-door, which when open takes a horizontal position and forms a temporary hearth at the front of the ash-box; 12, a horizontal port in the guard-door to permit of the insertion and movement of the shaking-handle when applied to the shake-bar; 13, air-ports in the guard-door, which air-ports are provided with a register or closing plate 17; 14, rivet holding closing-plate 17 to the guard-door and working loosely in a slot in the guard-door, as usual with sliding registers; 15, a lug projecting outwardly from closing-plate 17 to serve in sliding the plate to open or closed position; 16, the pintles of the guard-door hinges before referred to; 17, the closing-plate of the guard-door, provided at one end with a projection forming a bolt which will latch the guard-door shut when the closing-plate is in position to close the openings 13; 18, the front door of the ash-box, opening to the side, as usual, and adapted when closed to close the front of the ash-box air-tight; 19, air-registers in this door of screw type and adapted for air-tight closure; 20, the latch of the ash-box door, the guard-door being recessed to make room for it; 21, an angular spur projecting from the inner face of ash-box door 18 and adapted when the ash-box door is closed to engage lug 15 and force closing-plate 17 to open position; 22, diametrical slot disposed vertically in the end of one or both of the pintles 16 of the hinges of the guard-door; 23, upwardly open seat-notches in the door-jamb of the ash-box to receive the pintles 16; 24, pins projecting from the side jambs of the ash-box horizontally over the pintles 16; 25, a skirting around the exterior of the ash-box; 27, a juncture-ring at the top of the fire-pot; 28, the usual drum-seating in the top of the fire-pot.

When the ash-box door 18 is closed, the closing-plate 17 is in open position, thus permitting air admitted through registers 19 to find its way freely past the guard-door. Ports 13 and the closing-plate may be omitted in some cases and slot 12 in the guard-door be made large enough to provide for the inward passage of all the air that registers 19 will admit.

If the grate is to be shaken, then ash-door 18 is to be opened and the shaker-handle used through slot 12, the guard-door thus preventing the usual outward passage of ashes. To prevent the drop-door accidentally falling while the shaker is being used, it may be latched by operating-lug 15 by hand, it being obvious that closing-plate 17 may be present as a latching device, even if it be not arranged to act as a closing-plate proper.

When the ash-pan is to be removed, then the guard-door is to be unlocked and let down, forming a temporary hearth of use in connection with the ash-pan and serving to prevent ashes falling to the floor as the ash-pan is removed.

If the shake-bar be used while over the low

portion of guide-bar 10, the shake-bar will act merely as a pawl-carrier, spur 9 being free from the grate, and consequently the oscillations of the shake-bar will, owing to the action of the pawl, result in rotary motion of the grate. During this rotary motion the clinker becomes ground up between the periphery of the grate and the base of the wall of the fire-pot and falls through the annular opening, ashes, &c., passing through the same opening and through openings 5 in the grate. While this grinding is going on the ribs 6 on the grate urge the clinker toward the annular opening, where the grinding takes place, and at the same time the spirality of ribs 3 in the fire-pot produces a lifting action upon the upper portion of the mass of clinker, thus permitting the grinding to take place in the annular passage, while the clinker being ground is comparatively free from the pressure of the clinker above, the grinding action being thus rendered more easy and efficient.

If the grate is to be shaken instead of being rotated, as when ashes only are to be discharged, then the shake-bar is moved over onto the high part of guide-bar 10, which brings spur 9 into engagement with a perforation in the grate and virtually locks the bar to the grate. Shaking motion given to the shake-bar will then be transmitted directly to the grate.

The seat-notches 23 and pin 24 are cast in the door-jamb of the ash-box, and when the guard-door is in place the pins 24 prevent the accidental displacement of the guard-door from its hinge engagement with the door-jamb; but by opening the guard-door a trifling distance one end of the door may be lifted from its seat-notch 23, the slot 22 passing the pin 24, and thus permitting the door to be removed, the door being inserted in place by a reverse operation. Slot 22 need be in but one of the pintles, for when one of the pintles is freed from its seat-notch 23 the other pintle may be withdrawn endwise from its seat-notch.

We claim as our invention—

1. In a stove having a draft-passage, the combination of a shaking grate, shaking mechanism for said grate accessible through said draft-passage, a guard-door for ashes situated within said draft-passage and a draft-door for closing said draft-passage.

2. As an article of manufacture, a stove having an ash-box, a door hinged thereto at one side edge of said door, and inner guard-door hinged to said ash-box and provided with a slot to give access to the shake-bar, and provided also with air-ports and a closing-plate mounted on said inner guard-door, and a device on the outer door engaging and forcing said closing-plate in position to open said air-ports when said outer door is closed, substantially as described.

3. In a stove, the combination, substantially as described, of an ash-box, a door hinged thereto at one of the side edges of said

door, an inner guard-door also hinged to said ash-box and provided with air-ports and with a slot to give access to the shaker-bar, and a port-closing plate mounted on said guard-door in position to be engaged and moved to open position by said first-mentioned door when the latter is closed, substantially as described.

4. In a stove, the combination of an ash-box, a door hinged thereto at one of the side edges of said door, an inner guard-door hinged to said ash-box, a catch on said guard-door to hold it closed, and operative means on said outer door engaging said catch and throwing it to its closed position when said outer door is closed, substantially as described.

5. In a stove, the combination of an ash-box, a door hinged thereto at one of the side edges of said door, an inner guard-door also hinged to said ash-box, and provided with air-ports, a combined catch and port-closing plate mounted on said guard-door, and means on the outer door engaging and throwing said combined catch and port-plate when said outer door is closed, whereby the catch is caught and the ports are opened when the outer door is closed, substantially as described.

6. In a stove, the combination, substantially as set forth, of a fire-pot, a circular grate mounted therein and provided with ribs, a shake-bar pivoted to the center of said grate, and a pawl pivoted to said shake-bar and adapted to engage the ribs of the grate and give to the grate an intermittent rotary motion as the shake-bar is oscillated.

7. In a stove, the combination with a fire-pot and a circular grate mounted therein and provided with ribs, of a pivoted shake-bar, mechanism actuated by the shake-bar for rotating the grate, mechanism for securing the grate

and shake-bar together by the elevation of the latter, and means for elevating the shake-bar.

8. In a stove, the combination, substantially as set forth, of a fire-pot, a circular grate mounted therein and provided with ribs and openings, a shake-bar pivoted to the central portion of said grate, a pawl pivoted to said shake-bar and adapted to engage the ribs of the grate, a spur upon the shake-bar adapted to engage the openings in the grate but disposed in such low position as to be normally out of engagement with the grate, and a guide-bar adapted to support the shake-bar in such high position that said spur will engage the grate.

9. In a stove, the combination, substantially as set forth, of a fire-pot having spiral ribs upon its inner surface and toothed at its base, a circular grate mounted therein and having its upper surface in conical form and provided with perforations and with spiral ribs, and means for rotating said grate.

10. In a stove, the combination, substantially as set forth, of a door provided with cylindrical hinge-pintles one of which is diametrically slotted, a door-jamb provided with open notches to receive said pintles, and pins projecting from the door-jamb over said pintles.

11. The combination with a stove and inner guard-door, of an outer door, and mechanism actuated by the outer door for latching the inner guard-door.

FRANK A. KIEFER.
LAZARD KAHN.
HENRY OSTERBERGER.

Witnesses:

ABRAHAM BALLINGER,
E. R. SHIPLEY.