3 Sheets—Sheet 1

N. A. BOYNTON.

STOVE-GRATE.

No. 171,091. Patented Dec. 14, 1875.

Fig. 1.

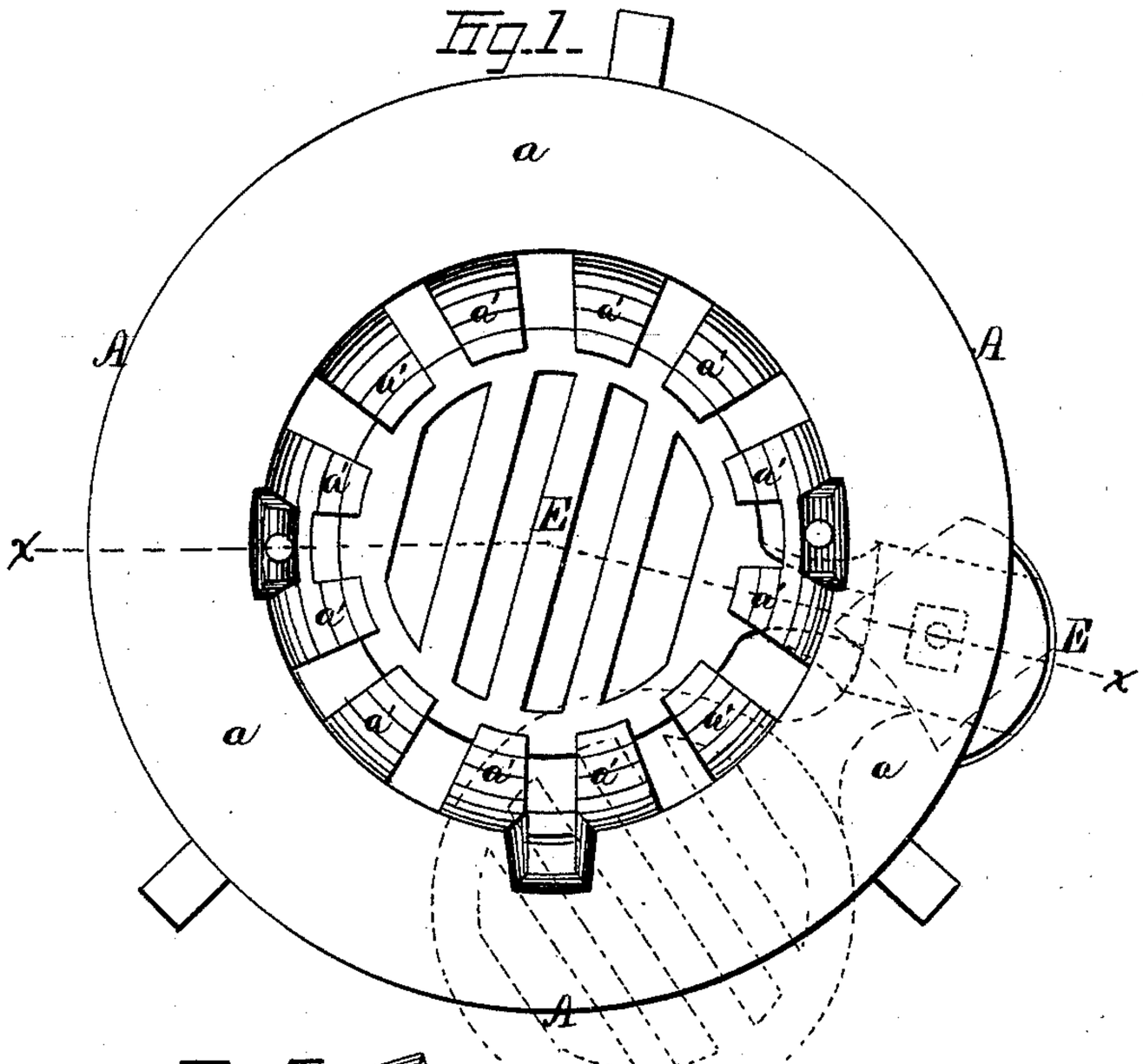
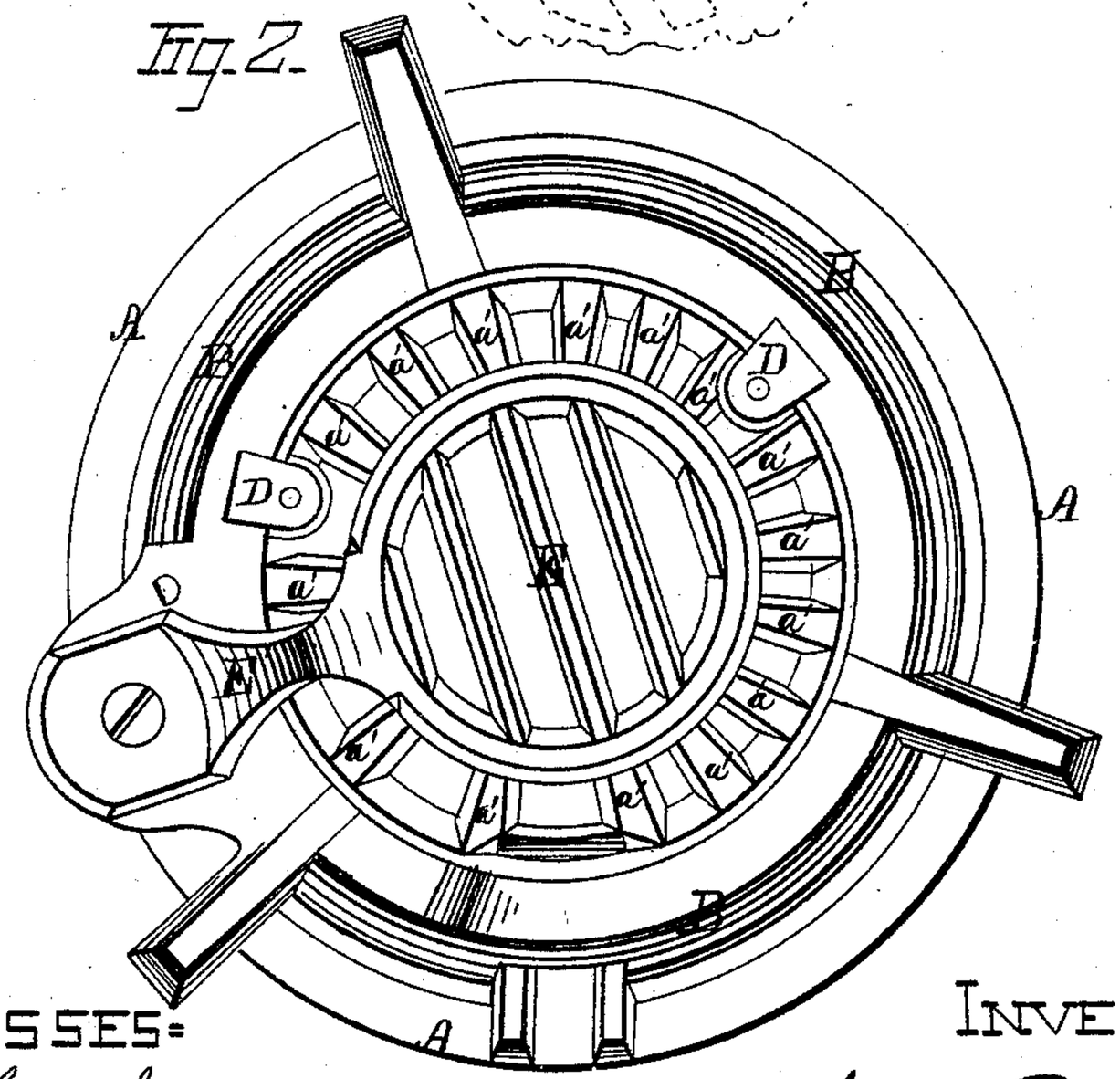


Fig. 2.



WITNESSES:

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Prindle and Deane, his Attys

3 Sheets—Sheet 2.

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Fig. 3.

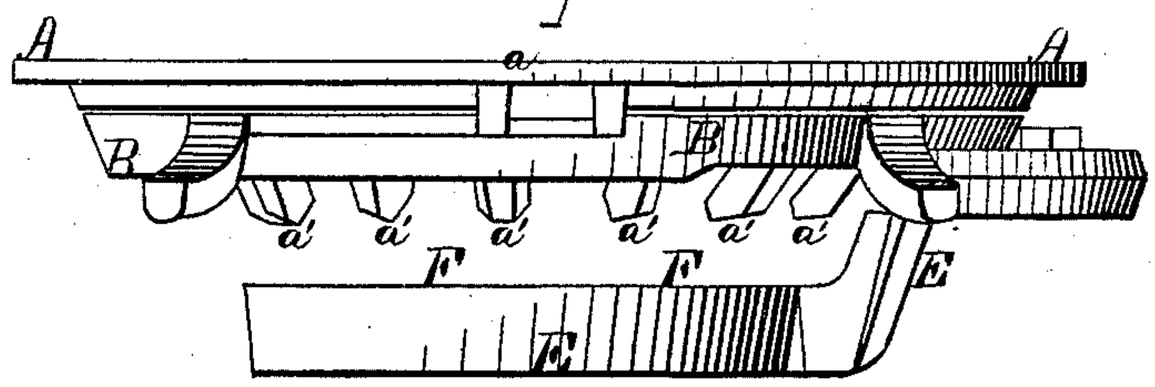
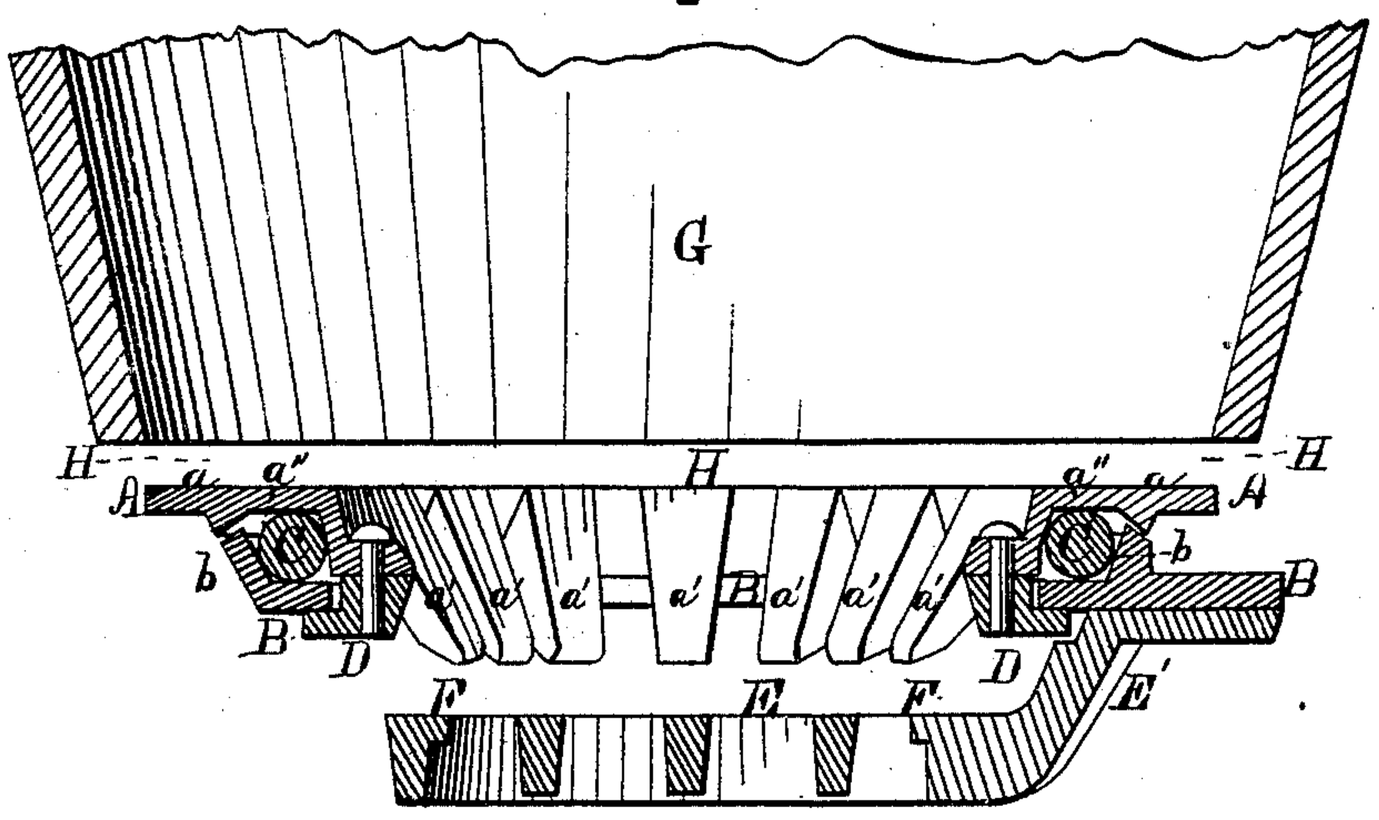


Fig. 4.



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3 Sheets—Sheet 3.

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Fig. 5.

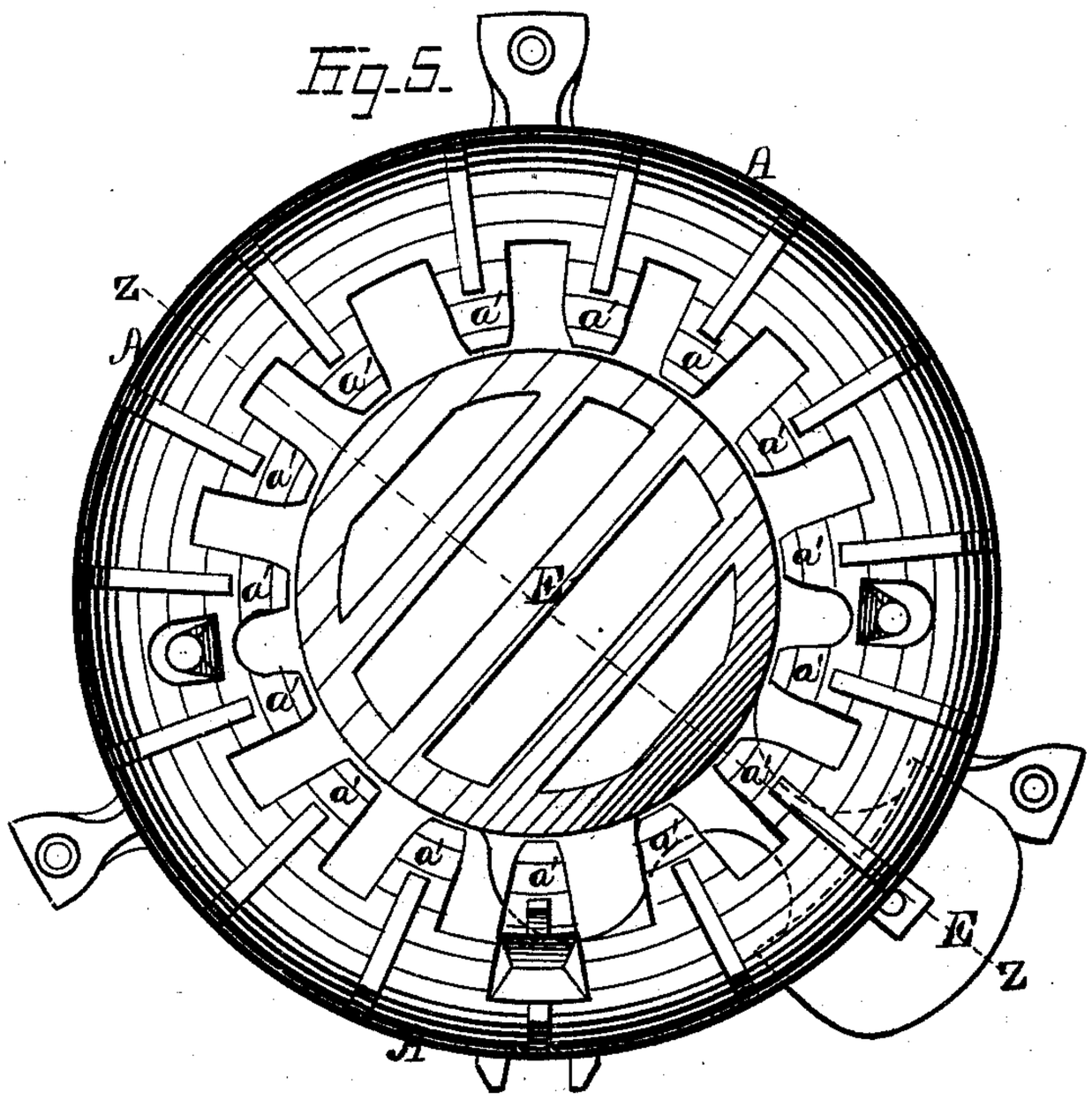
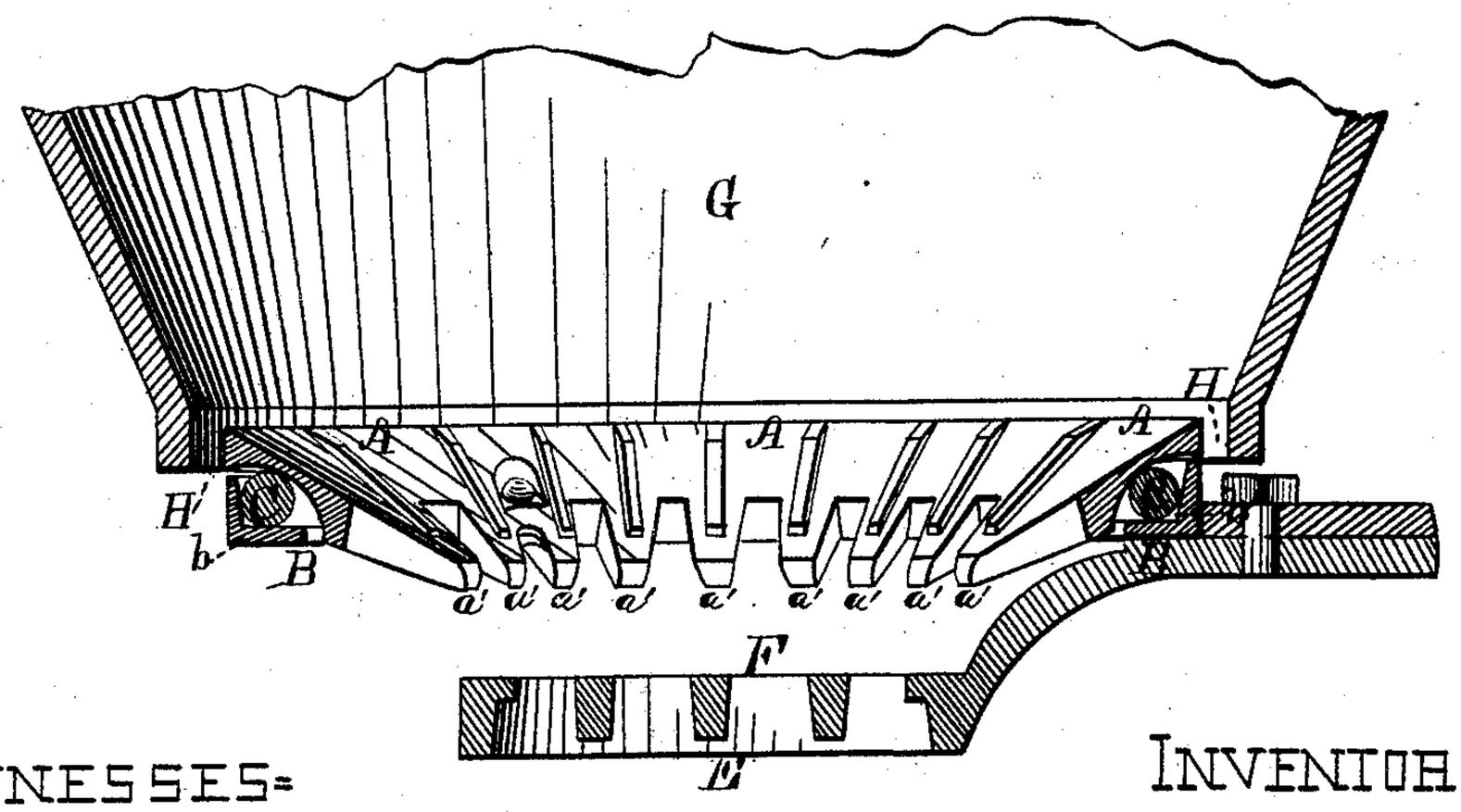


Fig. 6.



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UNITED STATES PATENT OFFICE.

NATHANIEL A. BOYNTON, OF NEW YORK, N. Y.

IMPROVEMENT IN STOVE-GRATES.

Specification forming part of Letters Patent No. **171,091**, dated December 14, 1875; application filed April 11, 1874.

To all whom it may concern:

Be it known that I, NATHANIEL A. BOYNTON, of New York, in the county of New York and in the State of New York, have invented certain new and useful Improvements in Stove-Grates; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figures 1 and 2 are plan views, respectively, of the upper and lower side of my grate, as constructed for use in a heating-stove. Fig. 3 is a side elevation of the same. Fig. 4 is a vertical section of said grate, and the lower end of the fire-pot, upon line *x x* of Fig. 1. Fig. 5 is a plan view of the upper side of said grate, as constructed for use in connection with a furnace; and Fig. 6 is a vertical section of the same, and of the lower end of its fire-pot, upon line *z z* of Fig. 5.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to increase the thoroughness and ease with which ashes, slate, and clinker may be removed from the fire-pot of furnace or stove; and it consists, principally, in combining with a main grate provided with a central opening, and arranged to rotate around its axial center, a supplemental grate placed below said central opening, capable of being moved laterally in a horizontal plane beneath the same, and having between its upper surface and the lower surface of said main grate a horizontal clearing-space, substantially as and for the purpose hereinafter specified. It consists, further, in combining with a main grate provided with a central opening, and arranged to rotate around its axial center, a supplemental grate, placed below said central opening, capable of being moved laterally in a horizontal plane from beneath the same, said supplemental grate being entirely independent of the motion of said main grate, substantially as and for the purpose hereinafter shown.

In the annexed drawings, A represents an annular grate, the outer portion of which, *a*, is plain and solid, while its inner half inclines downward and inward, and is formed of a series of radial bars, *a'* and *a'*, that are separated by corresponding openings or spaces, are disconnected at their inner ends, and inclose a central opening, which has, preferably, about one-half the diameter of said grate. The grate A is placed above a suitable annular base or supporting-plate, B, and within their contiguous faces are formed corresponding grooves or channels *a''* and *b*, respectively, which latter receive and contain three or more metal balls, C and C, that have such dimensions as to prevent said parts from coming into contact, and form rolling bearings for, and upon which the grate may rotate freely in a horizontal plane. Lateral partitions within one or both of said grooves limit the circumferential motion of the balls, and prevent the latter from changing materially their relative positions. Two or more lugs, D and D, are secured upon the lower side of the grate A, and, extending downward inside of the plate B, and thence outward beneath said plate, prevent the latter and said grate from being separated. At a short distance below the central opening of the grate A is placed a supplemental grate, E, which is circular, open, or barred, and at one side is provided with an arm, E', that extends radially outward, upward, and again outward, and at such upper outer end is pivoted to or upon the lower side of the plate B, such arrangement enabling said grate E to be swung horizontally beneath or away from said central opening. The horizontal dimensions of the supplemental grate E are substantially the same as the central opening of the main grate A, so that when in position the former virtually closes said opening to the downward passage of coal, but in order that ashes and small pieces of slate or clinker may readily escape from the fire-pot when said main grate is rotated or "shaken," a space, F, is left between the lower side of the latter, and the upper side of said grate E, as seen in Figs. 3 and 4.

As thus arranged, it will be seen that the lower supplementary grate furnishes a support for the central portion of the base of the column of fuel, and being at rest when the main grate is shaken, enables the latter to rasp from the outer lower portion of said column of fuel the ashes, clinker, and slate that obstruct the draft, and prevent in a greater or

lesser degree the outward passage of radiant heat, such result being more readily obtained by the relatively stationary position of said supplemental grate. The refuse matter is ground up and passes readily outward through the space F between the grates, unless the hardness or size of any pieces prevents their proper reduction, in which event said pieces may be removed by turning the supplemental grate to one side, so as to leave the central opening unobstructed.

In practice it is found that after the fuel has burned for several hours, as in the morning, if the supplemental grate is turned to one side before the main grate is shaken, all refuse matter will fall into the ash-pit without disturbing the coal, which latter will form a self-supporting arch. If, now, said supplemental grate is returned to place, and said main grate shaken, the burning fuel will be loosened, and caused to fall downward to and rest upon said grate, the fire being then as clean as when first lighted.

This grate is more especially intended for stoves, and the fire-pot G is arranged as shown in Fig. 4, its lower edge being just within the outer edge of the main grate, and somewhat above the upper face of the same, so as to leave between said parts a space, H, for the outward passage of ashes, slate, &c. When used for a furnace, the whole upper surface of the grate A inclines downward and inward, and at equidistant points upon its solid portion are formed radial ribs *a'''* that assist in agitating the fuel when said grate is shaken. The fire-pot G at its lower end has somewhat larger dimensions than those of the grate A, and extends downward outside of the latter, as seen in Fig. 6, so as to form between their contiguous portions a vertical annular opening, H', through which refuse matter may pass.

This improvement enables a fire to be easily and quickly cleaned, and renders impracticable the usual accumulation of slate, clinker, and ashes, which displace the coal, impede the draft, and compel the dumping of the contents of the fire-pot and the building of a fresh fire.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with a main grate provided with a central opening, and arranged to rotate around its axial center, a supplemental grate placed below said central opening, capable of being moved laterally in a horizontal plane beneath the same, and having between its upper surface and the lower surface of said main grate a horizontal clearing-space, substantially as and for the purpose specified.

2. In combination with a main grate provided with a central opening, and arranged to rotate around its axial center, a supplemental grate, placed below said central opening, capable of being moved laterally in a horizontal plane from beneath the same, said supplemental grate being entirely independent of the rotary motion of said main grate, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of April, 1874.

N. A. BOYNTON.

Witnesses:
HENRY A. RICHARDSON,
HENRY T. RICHARDSON.