(No Model.) 3 Sheets—Sheet 1.

L. BANNISTER.

GRATE.

No. 297,340. Patented Apr. 22, 1884.

Fig. 1.

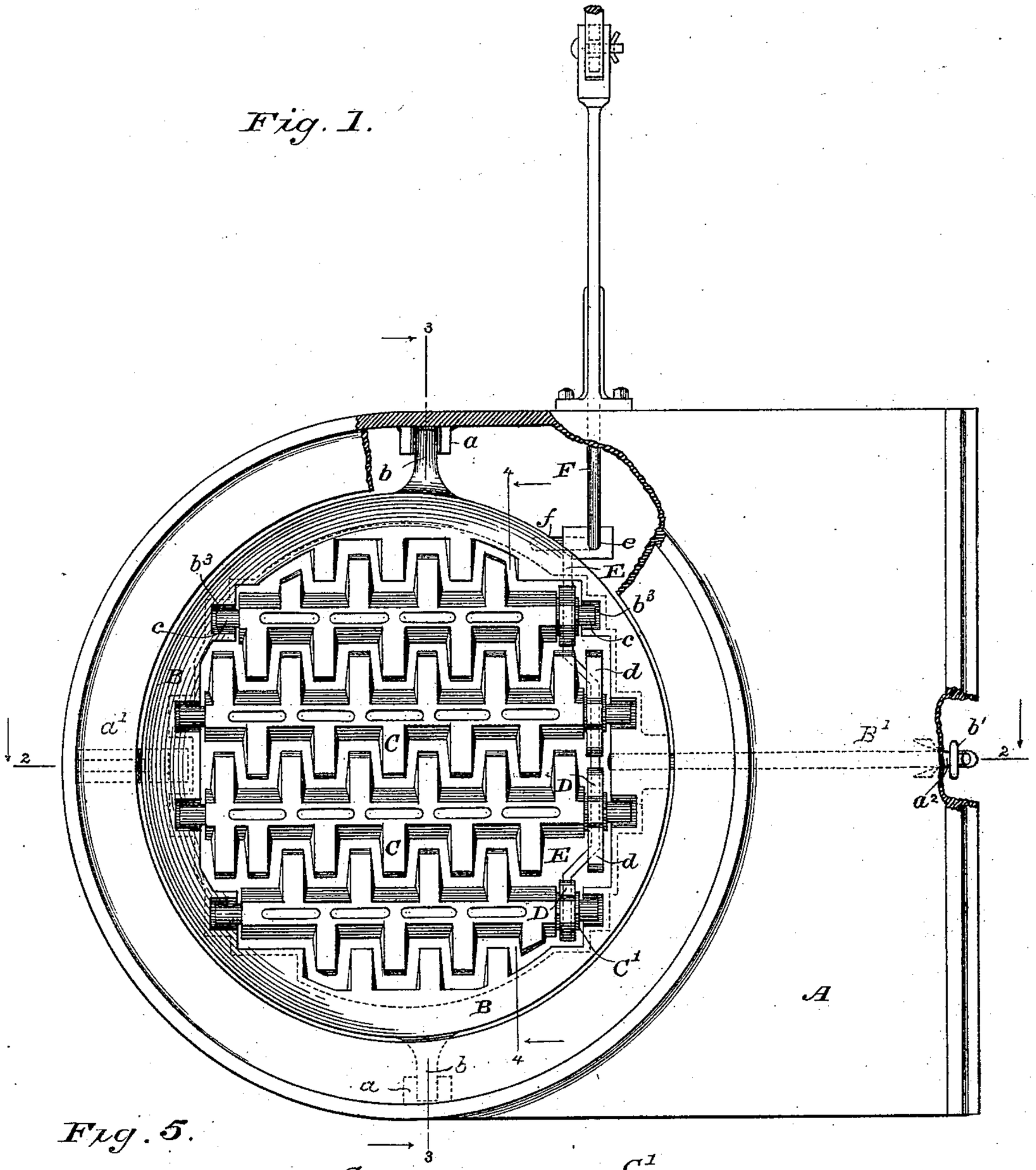
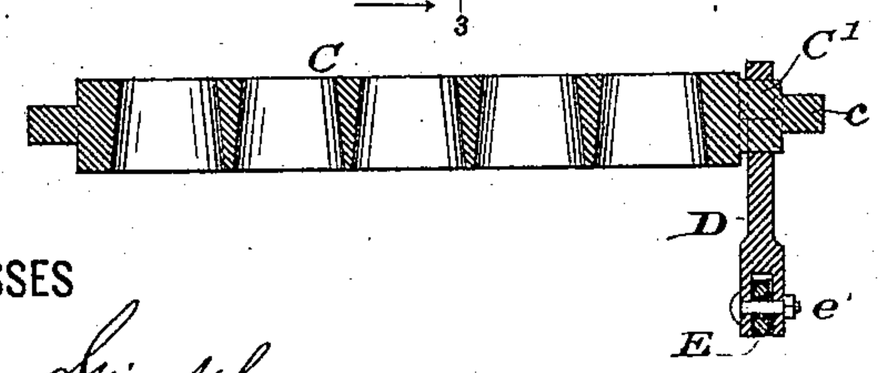


Fig. 5.



WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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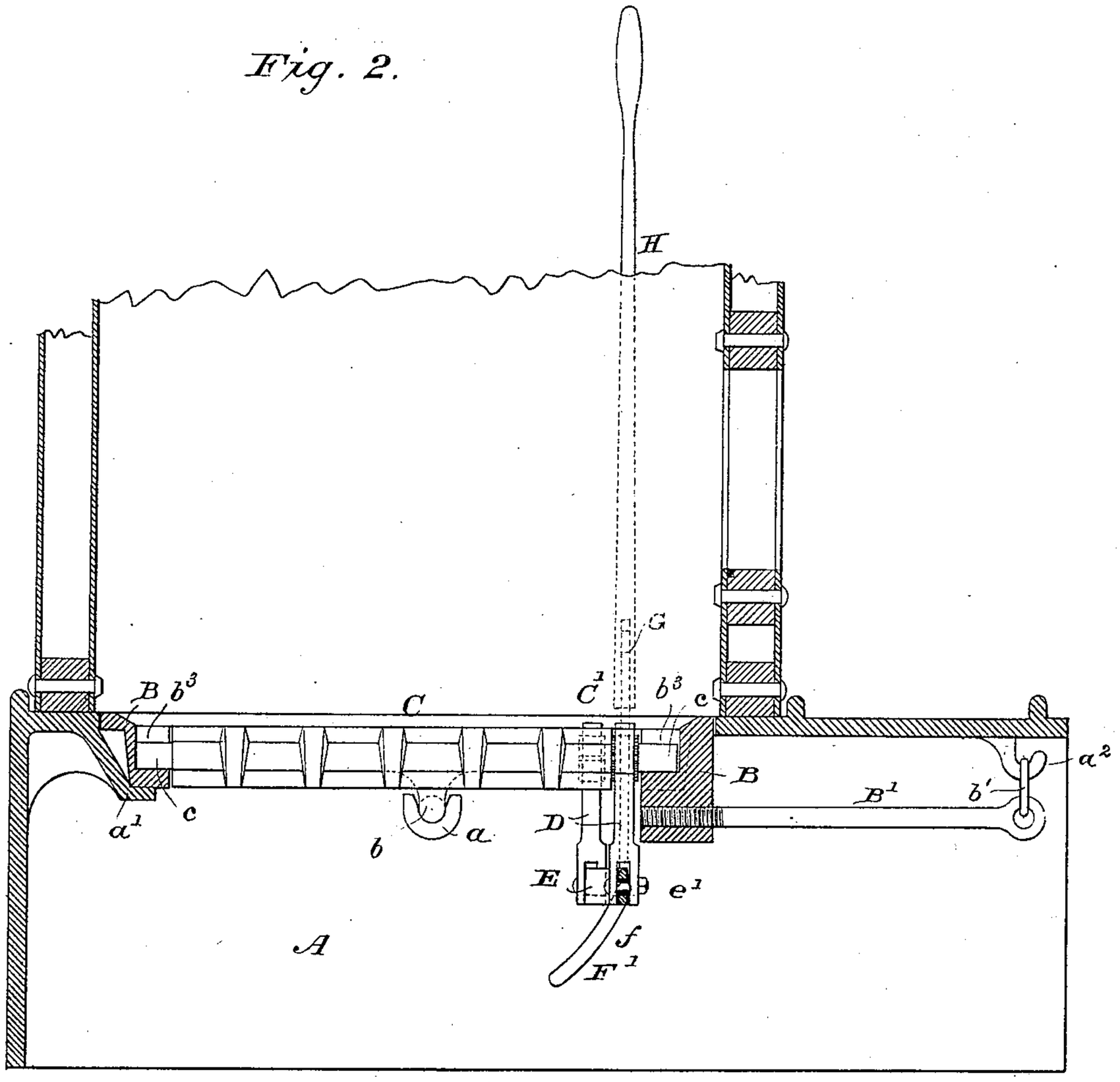
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

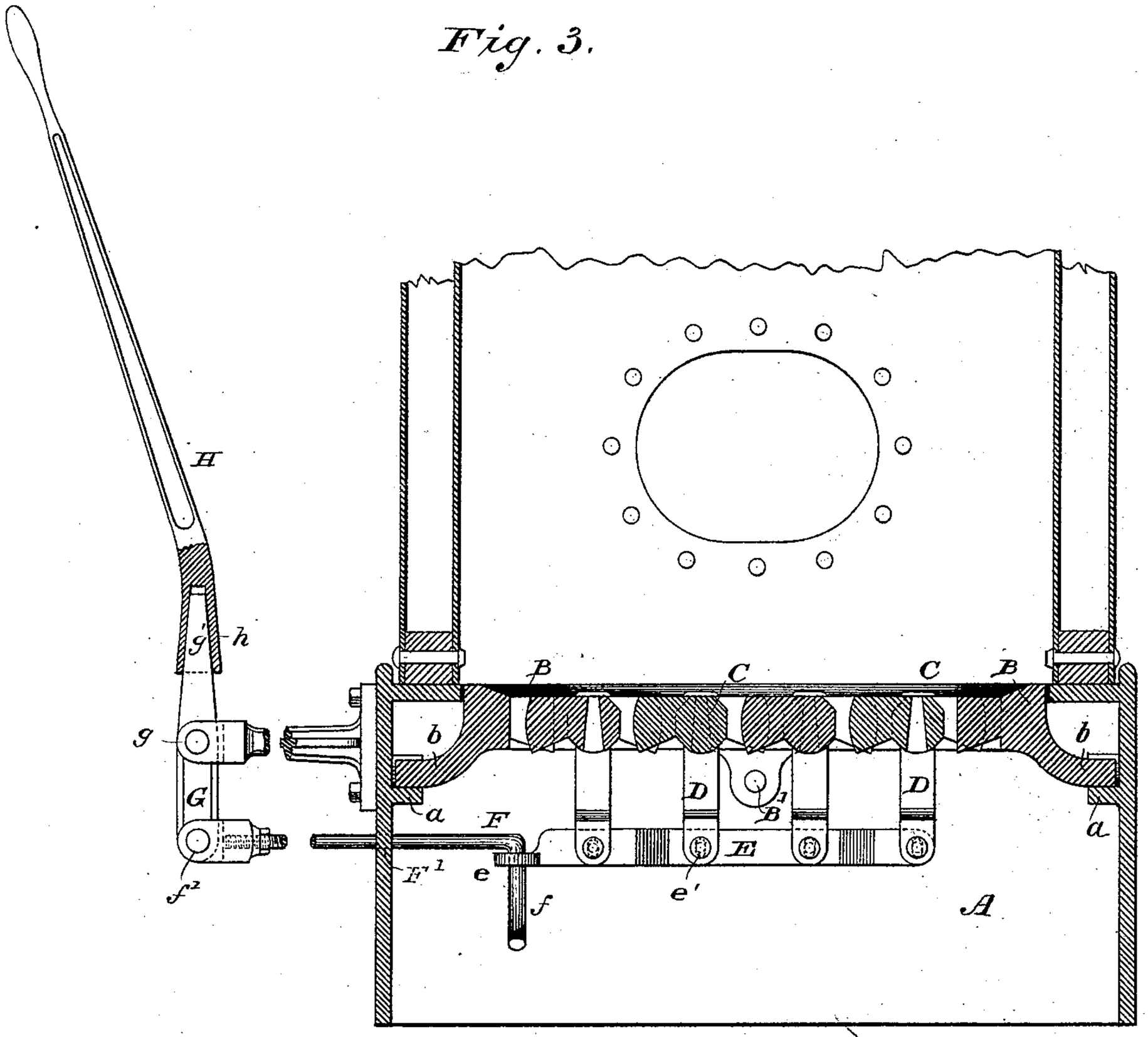
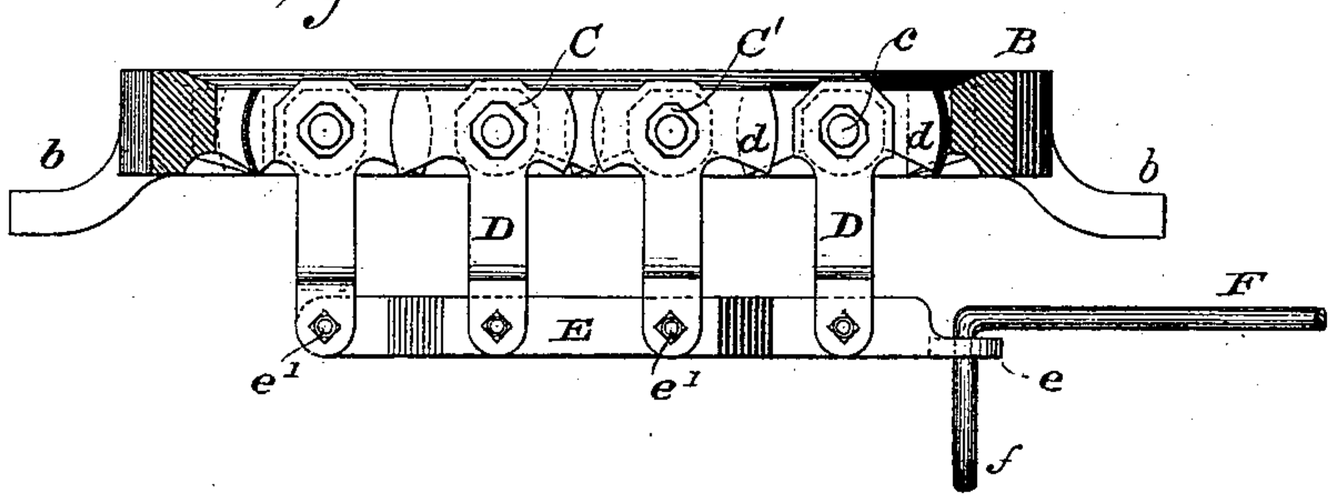


Fig. 4.



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UNITED STATES PATENT OFFICE.

LEMUEL BANNISTER, OF PHILADELPHIA, PENNSYLVANIA.

GRATE.

SPECIFICATION forming part of Letters Patent No. 297,340, dated April 22, 1884.

Application filed April 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL BANNISTER, a citizen of the United States, residing in the city and county of Philadelphia. and State of Pennsylvania, have invented certain new and useful Improvements in Grates, of which the following is a specification.

My invention more especially relates to that class of grates the bars of which are capable of being rocked separately and simultaneously for the purpose of agitating the fuel, the grate being also adapted readily to be dumped to clear the fire-box.

My improvements consist in certain novel organizations of instrumentalities for attaining these results.

The subject-matter claimed is hereinafter specifically designated.

The accompanying drawings represent so much only of the mechanism as is necessary to illustrate the subject-matter claimed, and show the invention as adapted to a round grate. My improvements are clearly applicable, however, to grates of polygonal outline. Where this latter form is employed a series of such grates might be used to secure a long fire-box or furnace, each section of which could be raked or dumped with facility.

Figure 1 represents a plan view of a grate with a portion of its supporting base or casing broken away to show the parts beneath. Fig. 2 represents a central longitudinal section therethrough on the line 2 2 of Fig. 1. Fig. 3 represents a vertical transverse section therethrough on the line 3 3 of Fig. 1, looking toward the front or handle end of the grate. Fig. 4 represents a vertical transverse section on the line 4 4 of Fig. 1, showing the ends of the grate-bars, their pendants, and coupling-bar, as seen from the front; and Fig. 5 represents a vertical longitudinal central section through one of the central grate-bars.

The base or casing A is shown as adapted to rest upon the ordinary ash-pit of a stove or furnace. The grate-supporting frame or ring B is provided with trunnions or journals *b*, which rock in bearings *a* in the case. The trunnions and bearings may be cast solid with the grate frame or casing, respectively, or they may be detachably connected therewith in well-known ways. These trunnions or pivots, it will be observed, are eccentric to the grate-frame—that is, they lie on one side of the central line passing transversely therethrough—in order to create a preponderance at one end of the frame to cause the grate to tip more readily. They may, however, be central.

In the drawings the grate is shown with its pivots nearer the front than the back in order to enable the grate readily to be lifted after being dumped. Its preponderance of weight is supported by a back-stop, *a'*, which may form a part of the casing or be detachably connected therewith. The grate is rocked by means of a rod or handle, B', projecting therefrom and locked in place, when elevated—that is, when the grate is in its normal position—by means of a hook, a^s, and a link, *b'*, or other suitable well-known fastening. As the bearings *a* of the trunnions *b* are open at the top, the grate-frame can readily be removed or replaced.

The grate-bars C are shown as provided at each end with trunnions *c*, resting in open bearings b^3 in the grate-frame B. The grate-bars are of the well-known studded, spiked, or winged variety, slotted longitudinally, and provided with connecting-webs at intervals, as shown in Fig. 5 of the drawings. The grate-bars represented in the drawings are substantially similar to those shown in Letters Patent No. 273,437, granted to me March 6, 1883. The form of the grate-bars, however, constitutes no part of the invention herein claimed, and their construction may be varied in various well-known ways without departing from the principle of my invention. A polygonal head, C', is formed on each grate-bar between its front spur and trunnion to receive the correspondingly-socketed head of a pendant, D. The pendant-heads are enlarged or provided with wings *d*, so as nearly to fill up the spaces between the grate-bars, and being within the fire-box assist materially in agitating the fuel. Each pendant is pivoted to a coupling-bar, E, beneath the grate. An eye, *e*, on one end of this coupling-bar fits loosely on a link-rod, F, the other end of which is pivoted to a lever, G, rocking on a pivot, *g*, on a bracket outside the casing, thus constituting a loose or swivel-joint connection between them. A rocking lever, H, provided with a socket, *h*, fits on the head *g'*

of the rocking lever, to rock the grate in well-known ways. The lower end, *f*, of the link-rod F is curved in the arc of a circle of which the trunnions *b* of the grate constitute the center, and consequently when the grate is dumped the coupling-bar slides down, thus connecting the rod without straining it. The bolts *e'*, connecting the pendants D with the coupling-bar E, pass through oblong slots in said bar, to permit a slight amount of play to compensate for any eccentricity of the grate bars or pendants. The link-rod F is connected with the rocking lever G by a pivot, *f'*, which accommodates the dumping movement of the grate above referred to. The link-rod traverses in a slot or guide, F', in the case A, the bottom of which serves as a rest or support for the link-rod when the grate is dumped. This slot should be made of such size and shape as readily to permit the link-rod or coupling-link F to be detached from the coupling-bar E, and may be closed by a removable plate or door in well-known ways.

The operation of the apparatus will readily be understood from the foregoing description.

The open bearings, as before remarked, permit of the ready removal or replacement of the grate-frame and grate-bars. Great facility is therefore afforded for ready access to all parts of the grate for cleaning or for other purposes, and the parts may also be assembled rapidly without difficulty. The latter can readily be rocked to agitate the fuel, and the whole grate can be dumped at once, instead of dumping each grate-bar separately. This rocking is readily effected by detaching the handle B', and as the preponderance of weight of the grate is to the rear it readily returns to its normal position, the link-rod F and its guide *f* readily accommodating the movements of the coupling-bar to this rocking movement.

It will also be obvious, so far as part of my invention is concerned, that the grate-bars might be arranged crosswise, instead of extending from front to back, as shown in the drawings, without otherwise varying the construction.

I am aware that, broadly, a pivoted dumping grate-frame has been provided with grate-bars pivoted transversely to the pivot of the frame and with devices for rocking the bars.

I am aware that a grate-frame having open bearings for the reception of rocking bars is old.

I claim as of my own invention—

1. The combination, substantially as herein-before set forth, of the casing, the grate-frame pivoted therein, the grate-bars pivoted in the grate-frame, their pendants, the coupling-bar, the link-rod connected with the bar by a swivel-connection, and the curved guide on the link-rod to enable the coupling-bar to conform without strain to the tilting movements of the grate.

2. The combination, substantially as herein-before set forth, of the tilting grate-frame, the grate-bars rocking therein, the pendants, the coupling-bar, the link-rod, the swivel-connection between the bar and link, and the guide-slot in the casing.

3. The combination, substantially as herein-before set forth, of the casing, its open bearings, the grate-frame, its trunnions resting in said bearings, the open bearings of the grate-frame, and the grate-bars resting therein, whereby both the grate-frame and grate-bars readily may be assembled or separated from each other and from the casing.

4. The combination, substantially as set forth, of the grate-frame, the grate-bars, the pendants for rocking the grate-bars interposed between the studs and trunnions of the grate-bars inside the grate-frame, and the wings *d* of the pendants, which constitute grate-bar teeth which serve to agitate the fuel.

5. The combination, substantially as herein-before set forth, of the casing, the tilting grate-frame, the grate-bars rocking therein, the tilting-handle of the grate-frame, the pendants, their enlarged heads, the coupling-bar, the link-rod, the loose or swivel-joint connection between the bar and link, the rocking lever, and the guide-slot in the casing.

6. The combination of the casing, the pivoted grate-frame, the trunnions on the sides of the grate-frame on which the frame rocks, the handle rigidly secured to the front of the grate-frame, and means for suspending the handle so as to hold the grate in a horizontal position, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 25th day of April, A. D. 1883.

LEMUEL BANNISTER.

Witnesses:
LEWIS G. FARMER,
JAMES F. SAVAGE.