

(No Model.)

J. N. BRIGGS.
VERTICAL CHUTE.

No. 369,390.

Patented Sept. 6, 1887.

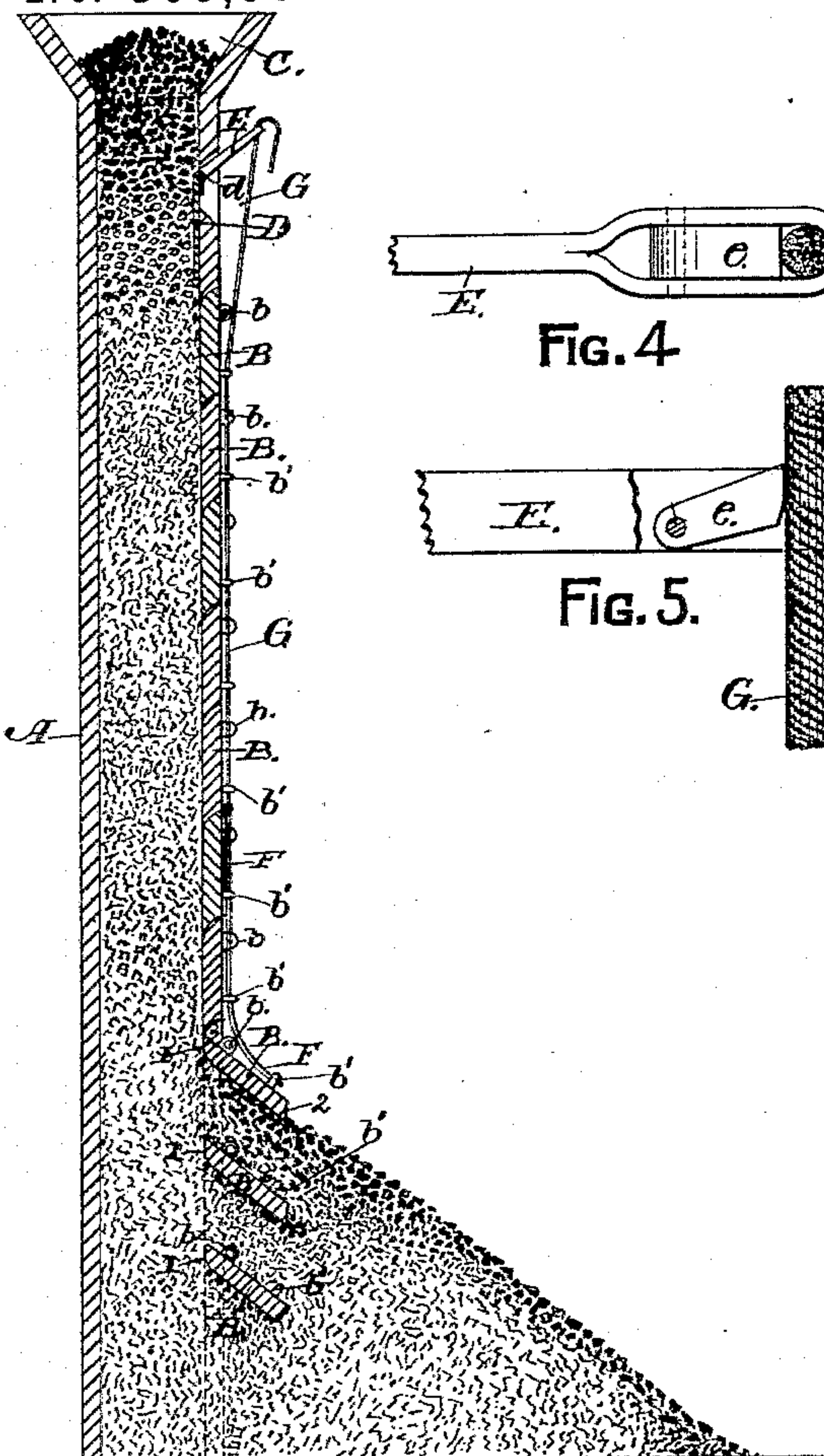


FIG. 1.

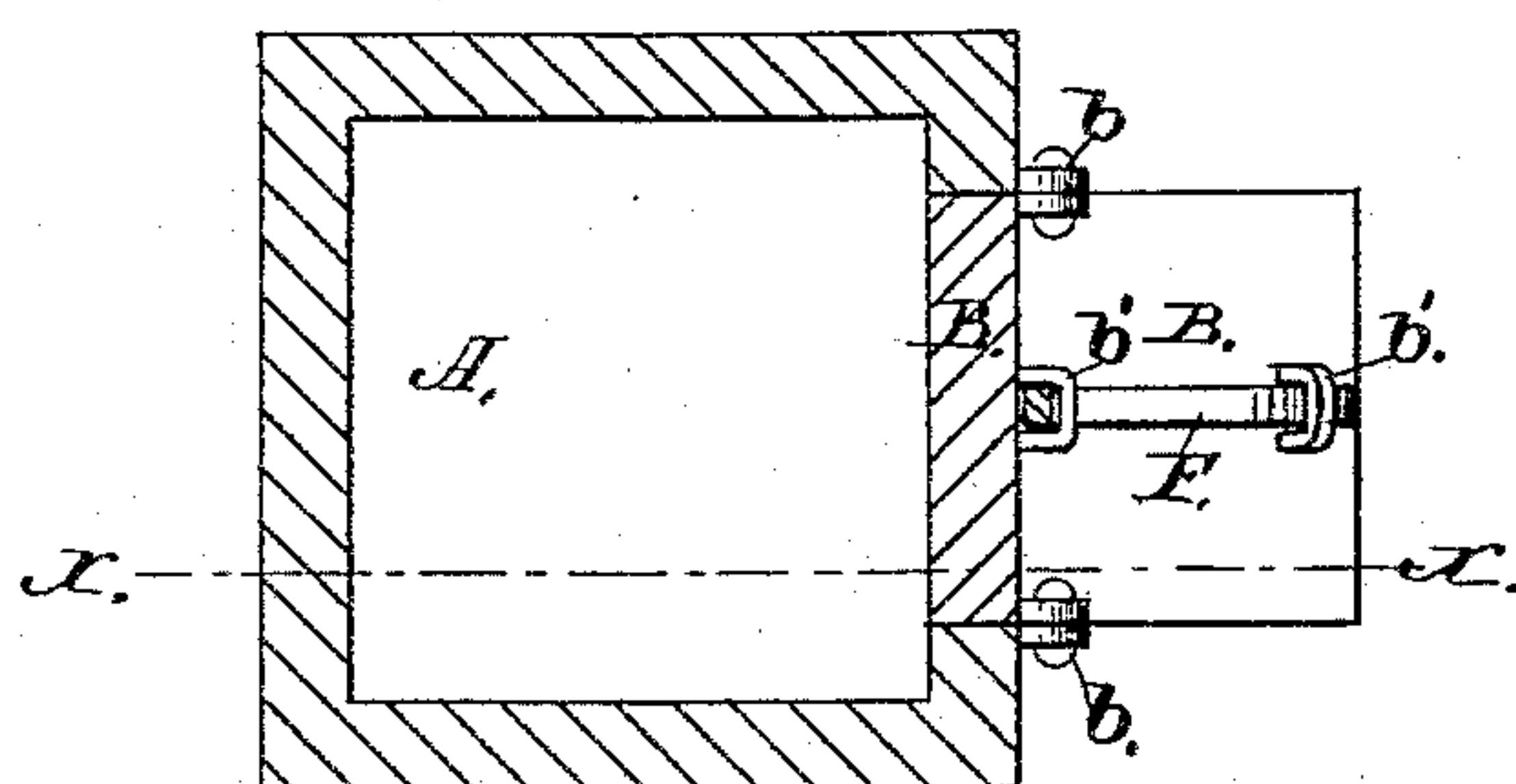


FIG. 3.

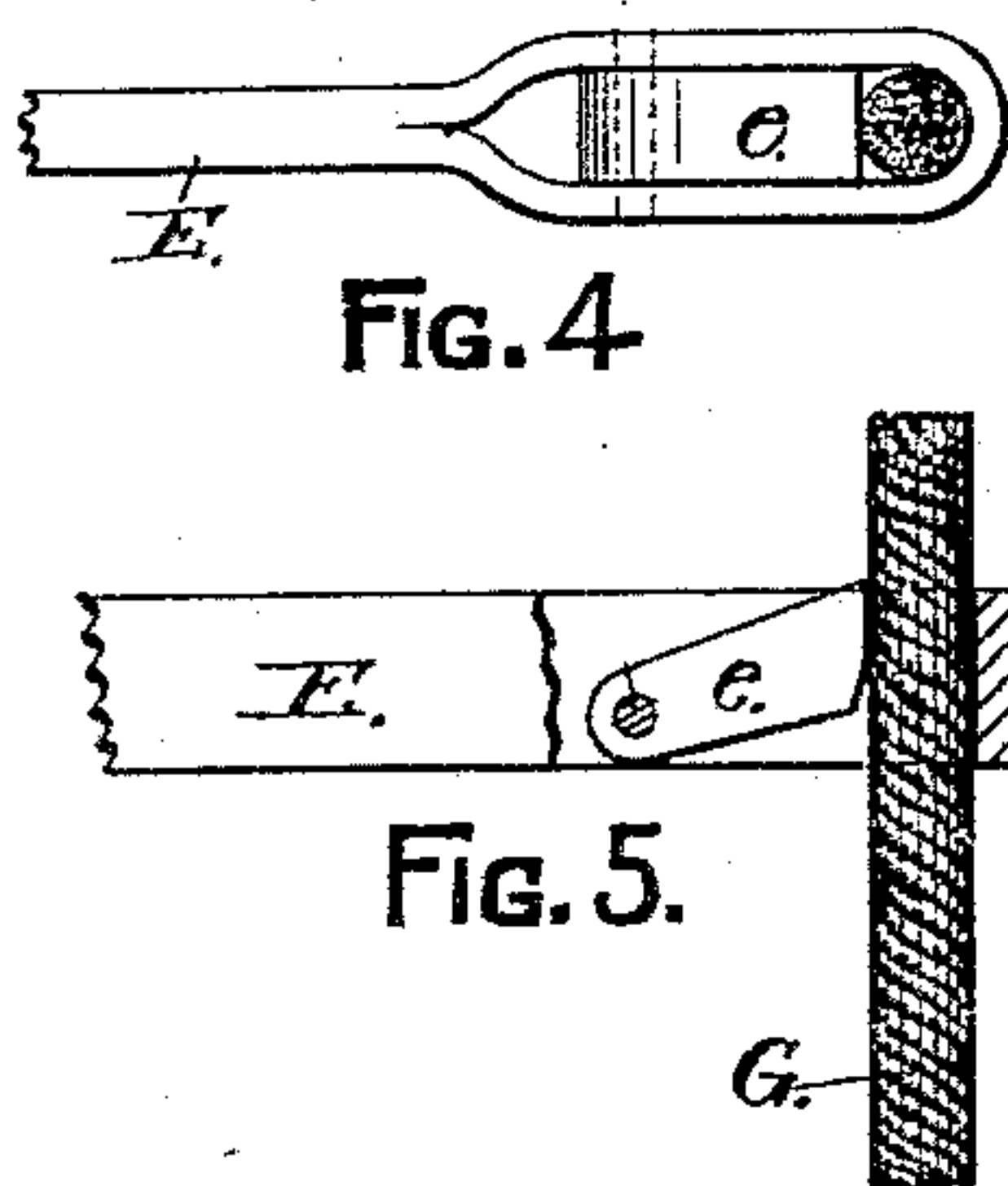


FIG. 4.

FIG. 5.

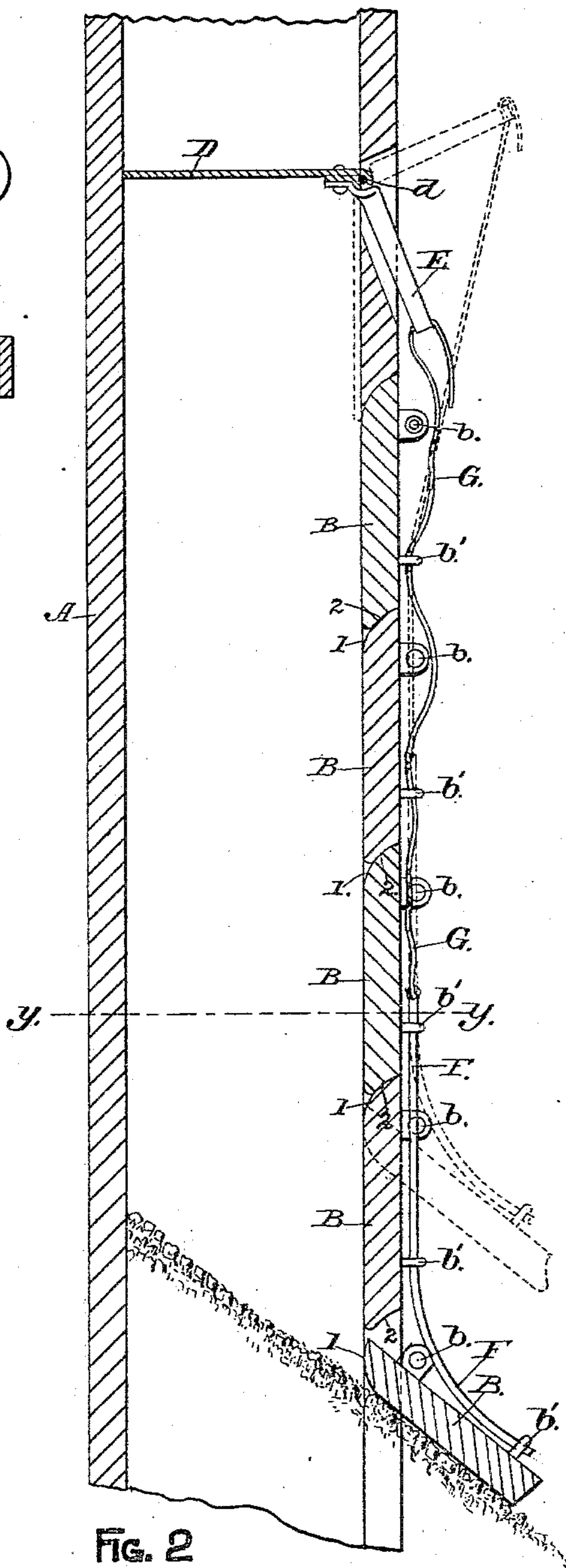


FIG. 2.

WITNESSES:

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by

INVENTION:

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UNITED STATES PATENT OFFICE.

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VERTICAL CHUTE.

SPECIFICATION forming part of Letters Patent No. 369,390, dated September 6, 1887.

Application filed June 16, 1887. Serial No. 241,471. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. BRIGGS, of Coeymans, in the county of Albany and State of New York, have invented new and useful
5 Improvements in Coal-Chutes, of which the following is a specification.

This invention consists of a vertical chute for conveying coal or other material from an elevation to a lower plane, said chute having
10 in one of its sides a series of interlocking doors or shutters hinged thereto and arranged one above another in such manner that neither door of the series except the lower one will be released preparatory to opening until the door
15 next below in the series has been opened far enough to effect such releasement, said doors being connected to an automatic disengaging device that is operated as hereinafter fully set forth and described; and the object of my in-
20 vention is to provide a chute for delivering coal from a higher to a lower plane without breakage. This object I attain by the mechanism illustrated in the accompanying drawings, which are herein referred to and form
25 part of this specification, and in which—

Figure 1 is a vertical section, at the line $x x$ on Fig. 3, of my chute filled with coal; Fig. 2, an enlarged vertical section of part of my chute when empty; Fig. 3, a horizontal section
30 of Fig. 2 at the line $y y$; and Figs. 4 and 5 are enlarged details of the rope-clamping device on the outer end of the arm of the tilting valve.

As represented in the drawings, A indicates my coal-chute, which may be made of wood or
35 other suitable material, in a rectangular cross-sectional form and of any preferred size and height. Said chute is made open at one side nearly to its top, and this opening is provided with a series of doors, B, which are arranged
40 one above another and so as to swing upwardly on the hinge-joints b , as shown in Figs. 1 and 2. A hopper-shaped top, C, is fixed on the upper end of said chute A for the purpose of facilitating the operation of dumping coal
45 thereinto; and just below said top a tilting valve, D, is placed horizontally across the vertical opening in said chute, for a purpose hereinafter explained. The valve D is pivoted, as
50 A, and is provided with an arm, E, which projects outwardly from the side of the chute

above the doors B. Said arm may of itself be sufficient to overcome the weight of the valve D, so as to normally hold the latter in a horizontal position, as shown by the full lines in
55 Fig. 2; but when preferred a counter-weight may be attached to the arm E to effect the same purpose.

Each of the doors B has at its upper edge a transverse convex curve, 1, and at its lower
60 edge a corresponding concave curve, 2. The said curves fit each other in such manner that when the series of doors, or any number of them, are closed the lower edge of each one will interlock with the upper edge of the door
65 next below it, so that a higher door cannot be opened until the next lower door has been swung open to release it.

The doors B are automatically opened in succession by means of a curved bar, F, which
70 engages in a staple, b' , fixed in the outer face of each of said doors for that purpose. Said curved bar is connected by a rope, G, or other flexible connection to the outer end of the arm E in such manner that when the valve D is
75 tilted down, as indicated by dotted lines in Fig. 2, the door with which the curved end of the bar F is at any time engaged will be swung open by the downward movement of the valve D. The rope G, after passing through the sta-
80 ples b' of the several doors, passes through the outer end of the arm E, wherein it is held by an automatic clamping device, which preferably consists of an arm, e , which is pivoted to the arm E, and is provided with an eccentric
85 and that engages with the rope and clamps it against the outer end of the arm E, which is bent for that purpose. The arm e will permit the rope G to be drawn freely upward through the arm E; but when a strain is ap-
90 plied to said rope in the reverse direction the arm e will instantly bite upon the rope and prevent it from slipping through the clamping device.

The operation of my chute is as follows: The
95 chute A being empty, with the doors B and valve D closed and the rope G slackened up, so that the tilting movement of the valve D will not affect the doors B, the coal is dumped into said chute until the latter is nearly filled,
100 so that the succeeding charges of coal will have but little distance to fall and the danger of

breaking the coal greatly lessened. When the chute has become sufficiently filled, the rope G is drawn up and fastened by the clamping device to the end of the arm E, so that the lower door of the series will be opened to permit the coal to escape through the opening left by raising said door. If the discharge of coal so produced leaves the valve D free to perform its tilting movements, each subsequent charge of coal that is dumped into the chute will cause said valve to tilt and produce an opening movement of said door. When the coal in the chute has been lowered far enough to set the valve D free, the latter will resume its normal position, (shown in Fig. 2,) and thereby the door with which said valve is at the time connected will be closed to stop the flow of coal. The parts will remain in the position last referred to until a fresh charge of coal is dumped into the chute to again tilt the valve D and reopen the door to which said valve is connected. This action continues until the door is held by the discharged coal in its raised position, as shown in Fig. 1, whereupon the rope G is drawn up to a sufficient distance to cause the curved bar F to open the next door of the series, and this operation is continued

until the highest door of the series has been opened and the coal discharged therethrough. It will readily be seen that the quantity of coal discharged through the opening uncovered by each successive door of the series will increase in a very rapid ratio and that a single chute will be sufficient for distributing a large amount of coal.

I claim as my invention—

1. A vertical chute having in one of its sides an opening which extends from the bottom to or nearly to the top of said chute, said opening being provided with a series of interlocking doors, as and for the purpose specified.

2. The combination of a vertical chute having in one of its sides an opening provided with a series of interlocking doors, and a tilting valve fixed within said chute and connected with said doors, the said doors and valve being connected in such manner that the doors will be automatically opened by the dropping movement of said valve, as and for the purpose specified.

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Witnesses:

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