(No Model.) 3 Sheets—Sheet 1.

# G. M. EAMES & J. STEVER.

## Elevator Hatch Door.

**No. 243,532.** **Patented June 28, 1881.**

Fig 1.

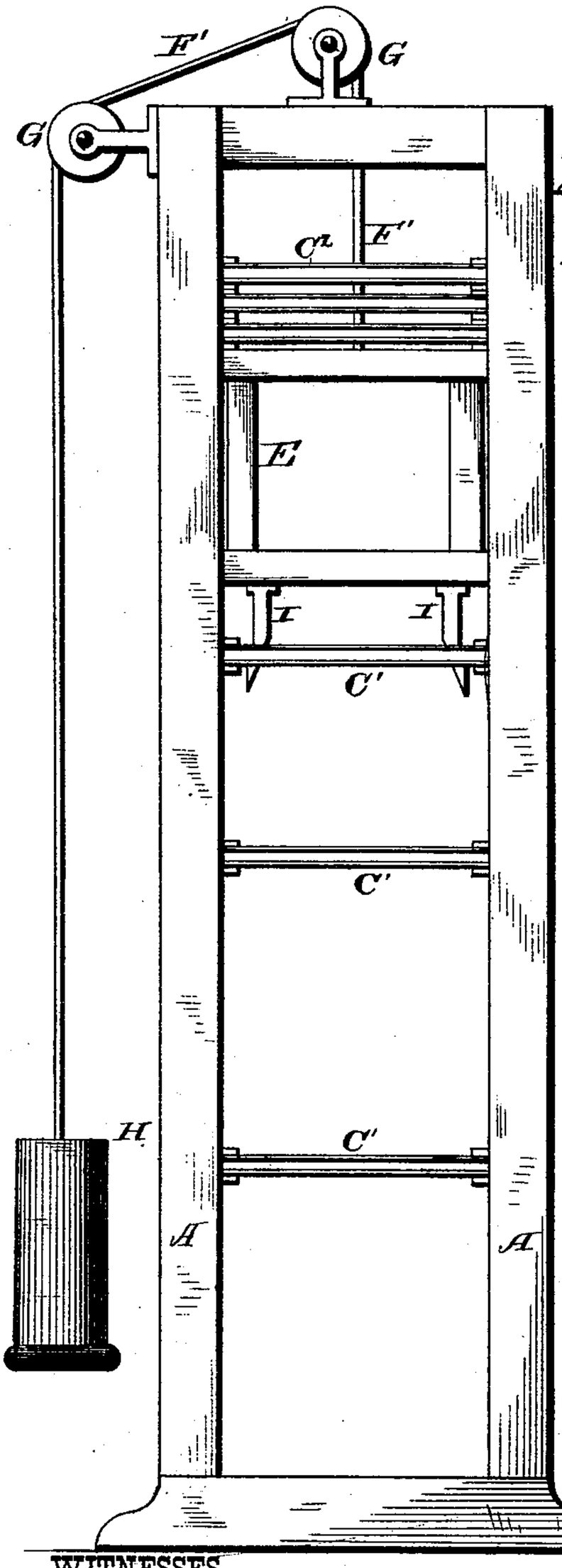
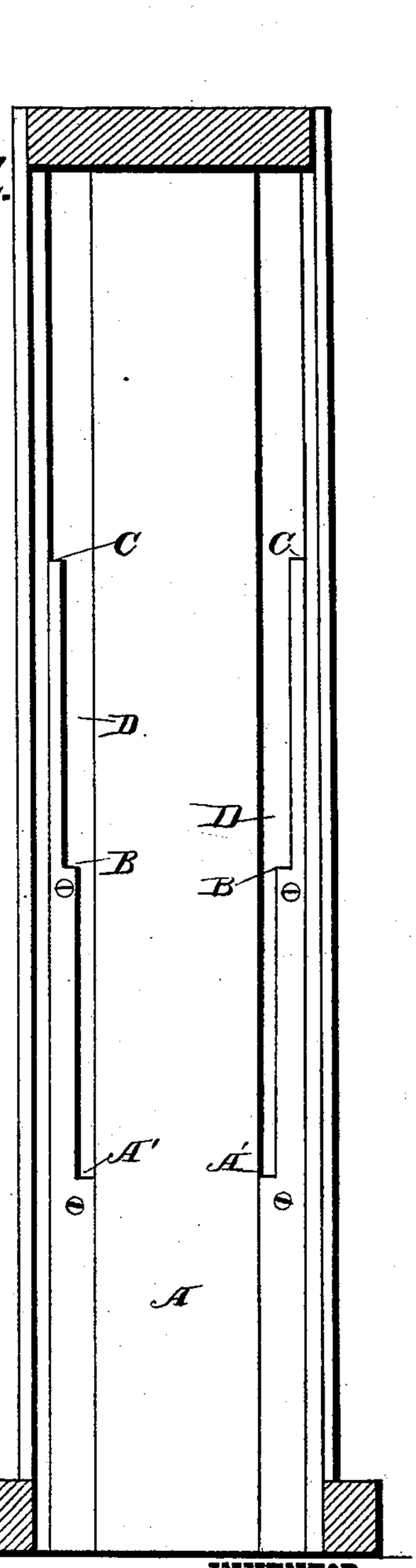



Fig 2.

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(No Model.) 3 Sheets—Sheet 2.

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## Elevator Hatch Door.

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Fig. 3.

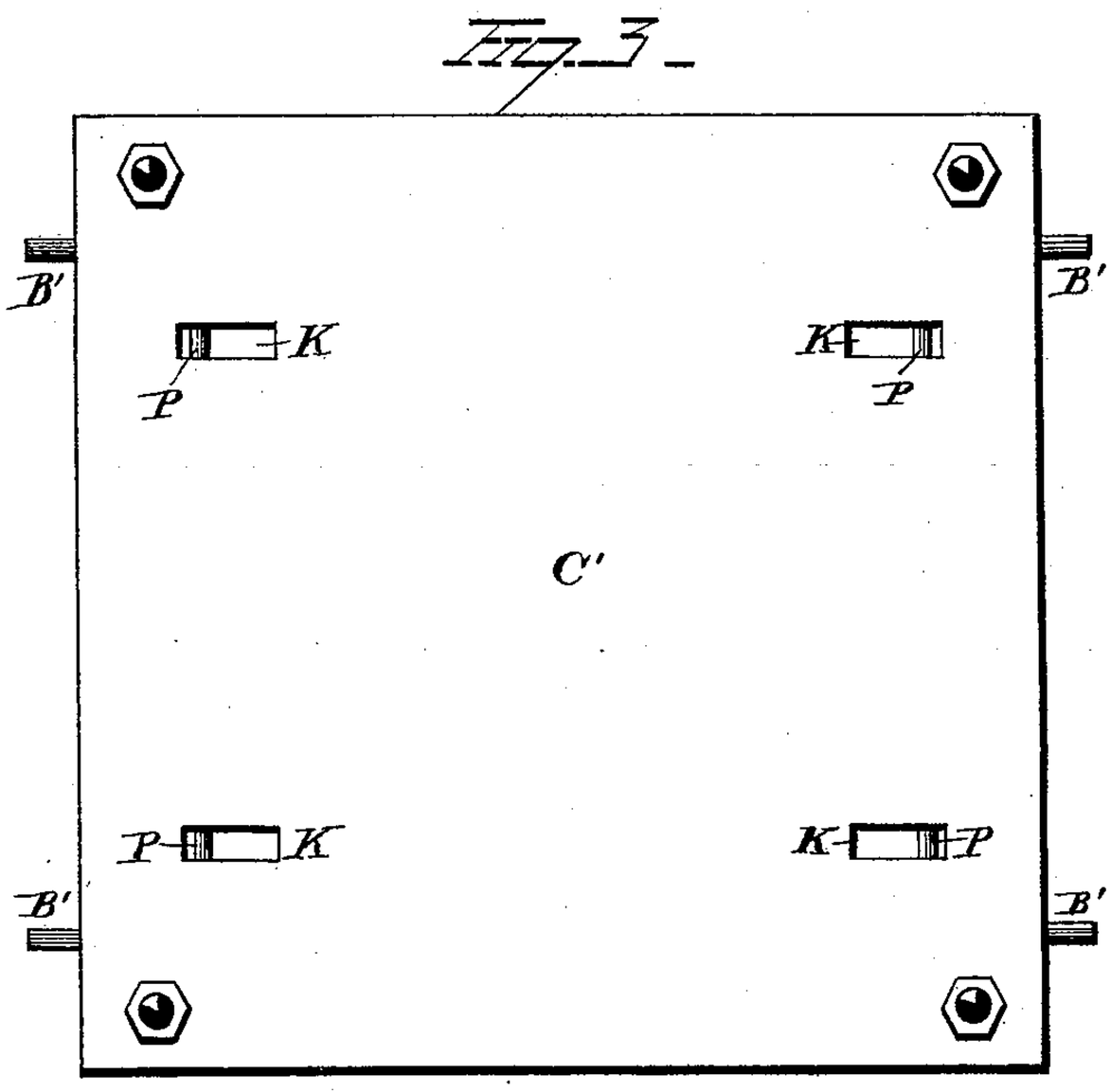
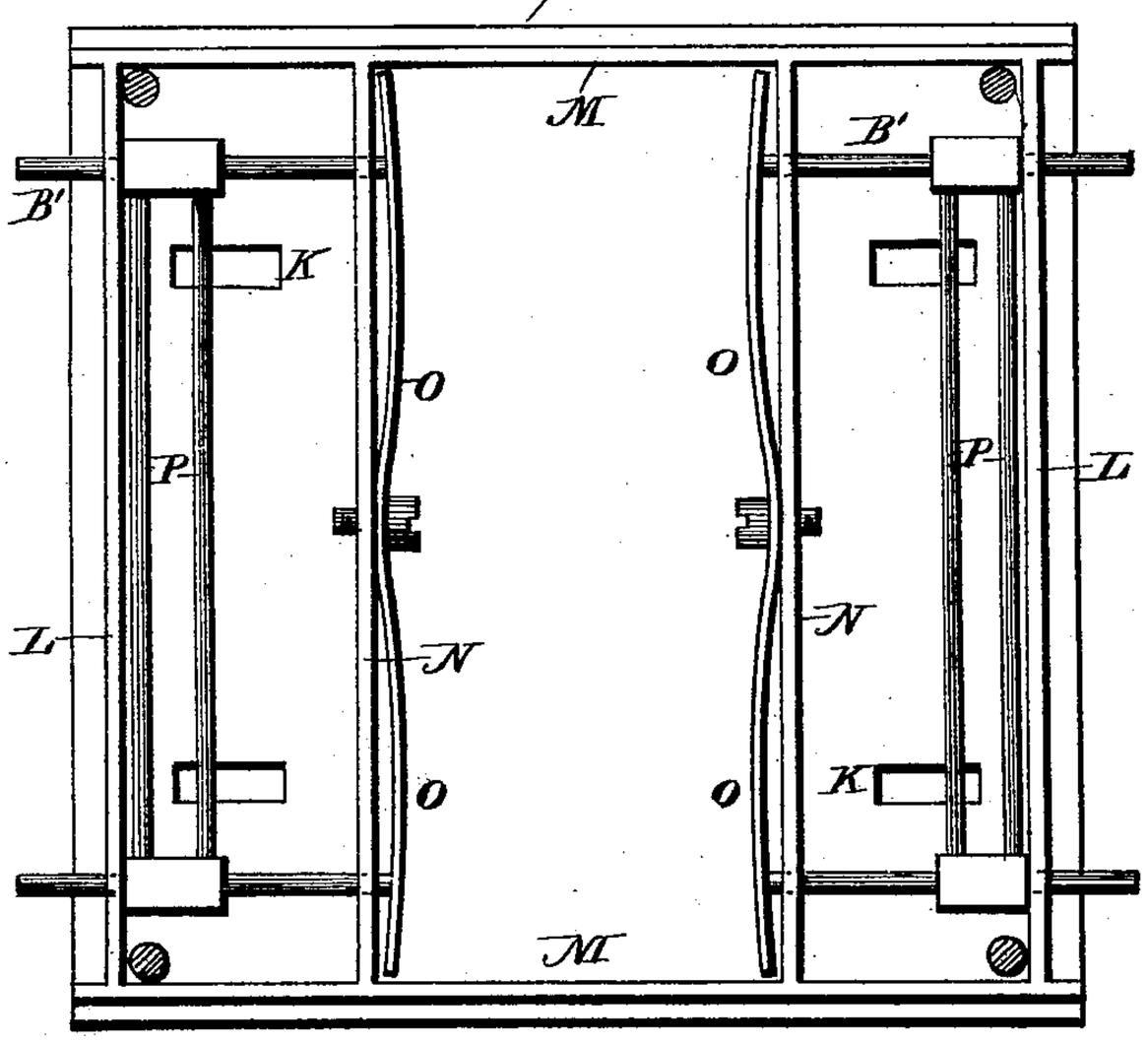



Fig. 4.

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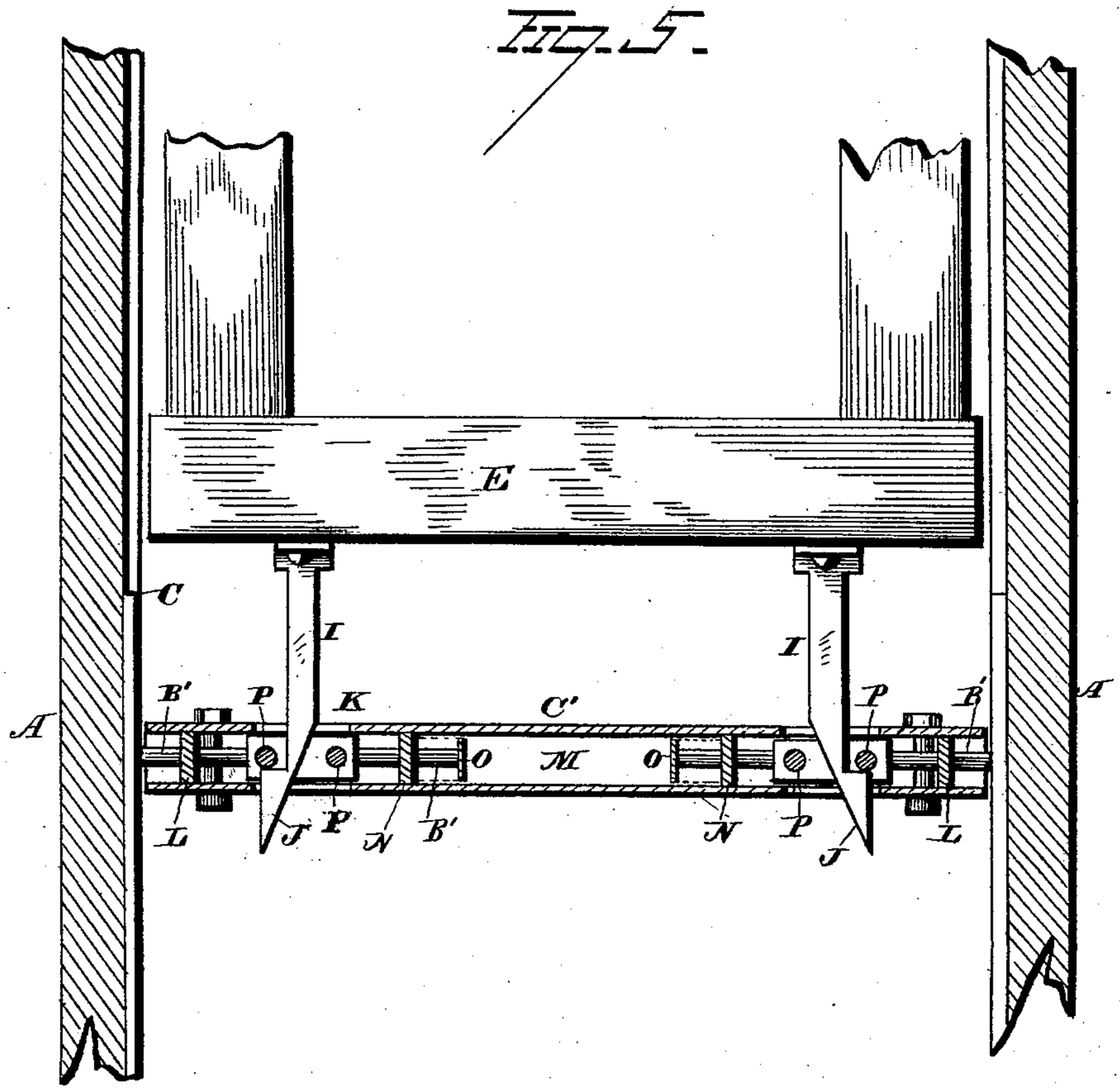
## Elevator Hatch Door.

No. 243,532. Patented June 28, 1881.

FIG. 5.

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# UNITED STATES PATENT OFFICE.

GEORGE M. EAMES AND JEREMIAH STEVER, OF BRIDGEPORT, CONN.

## ELEVATOR-HATCH DOOR.

SPECIFICATION forming part of Letters Patent No. 243,532, dated June 28, 1881.

Application filed March 26, 1881. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE M. EAMES and JEREMIAH STEVER, of Bridgeport, in the county of Fairfield and State of Connecticut, have jointly invented certain new and useful Improvements in Hatch-Doors for Elevators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in the construction of and devices for automatically operating hatch-doors to close the hatchways of an elevator-shaft, the objects being to prevent draft through the shaft in case of fire, and to avoid all possible accidents liable to occur owing to unguarded hatchway-openings.

With these objects in view our invention consists in the novel construction of the hatch-doors and in devices for operating two series of them, each of said series being located respectively above and below the elevator-car, and adapted to be successively collected upon the top of and distributed from the bottom of the car in its ascent, and to be engaged with the bottom of and distributed from the top of the car in its descent, so that the hatchways of the shaft will always be closed, whether the car is at the upper or lower terminus of the shaft or in transitu between them.

Our invention further consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of an elevator-shaft exhibiting the elevator-car, series of hatch-doors, and devices for operating them. Fig. 2 is a view of one side of the shaft, showing the graduated series of strips which support the hatch-doors. Fig. 3 is a plan view of a single hatch-door. Fig. 4 is a view thereof with the metallic covering removed. Fig. 5 shows the cam-hooks in engagement with one of the doors.

Let A A represent the sides of an elevator-shaft having four similarly disposed series of graduated steps, A′, B, and C, secured to the inner faces thereof and offering adjustment to the spring-bolts B′ of the hatch-doors C′, which close the hatchways of the first, second, and third stories respectively. These steps, which consist in this instance of bars of metal of different lengths graduated from the lower to the upper story, are located in vertical recesses D formed in the sides A A of the elevator-shaft.

E is the elevator-car, of ordinary construction, and actuated in reciprocating vertical movement through hoist-rope F′ by any suitable and approved devices, those here shown consisting merely of two mounted sheaves, G, and weight H. The lower face of the car is provided with four depending cam-hooks, I, which are rigidly secured thereto and have their barbed faces turned toward the sides of the elevator. The inner faces of said hooks are provided with planes or wedges J, inclining inwardly from their points. In length the hook should be sufficiently long to penetrate the entire number of doors of the lower series at once.

The hatch-doors C′, belonging to the series located below, and adapted to be engaged with the bottom of the elevator-car, are, as here shown, three in number. They are preferably constructed of metal, or covered therewith, and are pierced at suitable points with four elongated slots, K, to receive the hooks I, which operate to withdraw the bolts B′ from engagement with the steps. The frames of said doors consist of two side bars, L L, and front and rear bars, M M, joined at right angles to each other. Two bars, N N, having their ends joined to the front and rear bars, M M, and located in lines parallel with the bars L L, have the rear ends of the bolts B′ journaled in them, and also support springs O O, which constantly impinge upon and tend to force the outer ends of the said bolts outwardly.

The bolts B′, of which there are four to each hatch-door, are joined in pairs by two rods, P P, between each pair of which two of the hooks K′ are received. The inwardly-inclined faces of the said hooks impinge against the inner of the said bars P, overcome the springs O, and withdraw the bolts from engagement with the steps holding the hatch-door acted upon. This will be effected only in the descent of the car. In its ascent the moment any one door reaches its proper station the bolts will

be forced outward to rest on the top face of the steps. This forward motion of the bolts will carry the rods P toward the bars L L and release the barbs J of the hooks from engagement with the outer of said rods P, and allow the hooks to be entirely withdrawn from the door, and so deposit it at its proper station.

It is yet to be observed that no two of the doors of the lower or of the upper series of doors, $C^2$, are alike in so far as the bolts are concerned—that is to say, the bolts of the different doors $C^2$ are graduated in length, for the reason that the bolts of each door must be placed in position to engage with the respective steps thereof, and it has before been mentioned that no two sets of the steps are in line. Every hatch-door of the lower series has, however, a counterpart to those in the upper series, as in raising and lowering the car a door of each series occupies the same position. The latch-doors of the upper series are similar to those of the lower in general construction, but are different therefrom in being imperforate and having fixed instead of spring-pressed bolts. In the ascent of the car these doors of the upper series are successively collected, and in its descent they descend with it until their projecting bolts engage with the steps appropriate to them and their downward progress is checked. Assuming, now, that the car is at the lower terminus of the shaft, the doors of the upper series will close the hatchways of the first, second, and third floors, and the doors of the lower series will be engaged with the hooks attached to the under face of the car, while when the car is at the upper terminus of the shaft the reverse is true, as then the upper series of doors will be collected on the top of the car and the doors of the lower series will occupy the hatchways of the first, second, and third floors respectively. When the car is *in transitu* the doors of the different series will be disposed in the hatchways and on the top and bottom of the car, according to its location on the shaft.

We are aware that detached hatch-doors have been arranged to be raised by ropes and counter-weights, and forced downwardly by the elevator-car; also, that graduated steps have been provided for a series of hatchway-doors. Hence we make no broad claim to such construction and arrangement of parts.

We would have it understood that we do not limit ourselves to the exact construction shown and described, but hold ourselves at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an elevator, the combination, with two series of hatchway-doors located respectively above and below the elevator-car, of devices substantially as herein described, combined with the elevator-car for disconnecting the lower series of hatch-doors from their supports when the elevator-car descends, and for raising said series of hatch-doors and releasing them from the elevator-car when each one of said hatch-doors has reached its proper position in the elevator, while the upper series of hatch-doors are constructed to be collected upon and distributed from the top of the elevator-car, substantially as set forth.

2. In an elevator, the combination, with two series of hatch-doors respectively located above and below the elevator-car, of bolts projecting from the opposite sides of said doors, and a graduated series of steps adapted to engage with the bolts of the appropriate door and hold the same in proper position in the shaft, substantially as set forth.

3. In an elevator provided with two series of hatch-doors located respectively above and below the car, the upper series of said doors being provided with rigid bolts projecting from the sides thereof at suitable points to engage with their appropriate steps, formed in the side of the elevator-shaft, the lower series of said doors being provided with spring-pressed bolts projecting from the sides thereof at suitable points to engage with their appropriate steps, and adapted to be released from engagement therewith in the descent of the car by hooks attached to the bottom thereof, substantially as set forth.

4. In an elevator, the combination, with a series of hatch-doors located below the elevator-car, each of said doors being provided with spring-pressed bolts arranged to engage with appropriate steps located at the side of the elevator-shaft, of hooks depending from the bottom of the car, and adapted to pass through perforations in the doors and engage with rods connecting said bolts, and through them to withdraw the bolts from the steps with which they are engaged, substantially as set forth.

5. In an elevator, a series of hatch-doors located below the elevator-car, said doors being provided with spring-pressed bolts adapted to be laterally reciprocated by hooks attached to the bottom of the car, which pass through apertures in the said doors and withdraw the bolts from engagement with the steps located in the elevator-shaft by forcing back rods connecting two of said bolts, substantially as set forth.

6. In an elevator, the combination, with hooks attached to the bottom of an elevator-car, of a series of perforated hatch-doors provided with spring-pressed bolts adapted to be actuated by the hooks through the said perforations, substantially as set forth.

7. In an elevator, a series of hatch-doors adapted to be engaged with hooks attached to the bottom of the elevator-car when the same is at the bottom of the shaft, and to be distributed during the ascent of the car as the spring-pressed bolts of the several doors engage with their appropriate steps, and thus release the barbs of the said hooks from en-

gagement with the rods connecting two adjacent bolts, substantially as set forth.

8. In an elevator, a series of hatch-doors located below the elevator-car and adapted to close the hatchways of the different floors when the car is at the upper terminus of the shaft, and to have their spring-pressed bolts withdrawn from engagement with their appropriate steps by and to be collected upon hooks attached to the bottom of the car in the descent, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 14th day March, 1881.

GEO. M. EAMES.
JEREMIAH STEVER.

Witnesses :
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R. M. HOUSTON.