(No Model.) 2 Sheets—Sheet 1.

E. D. TOOPS.

ELEVATOR GATE.

No. 482,286. Patented Sept. 6, 1892.

FIG. 1.

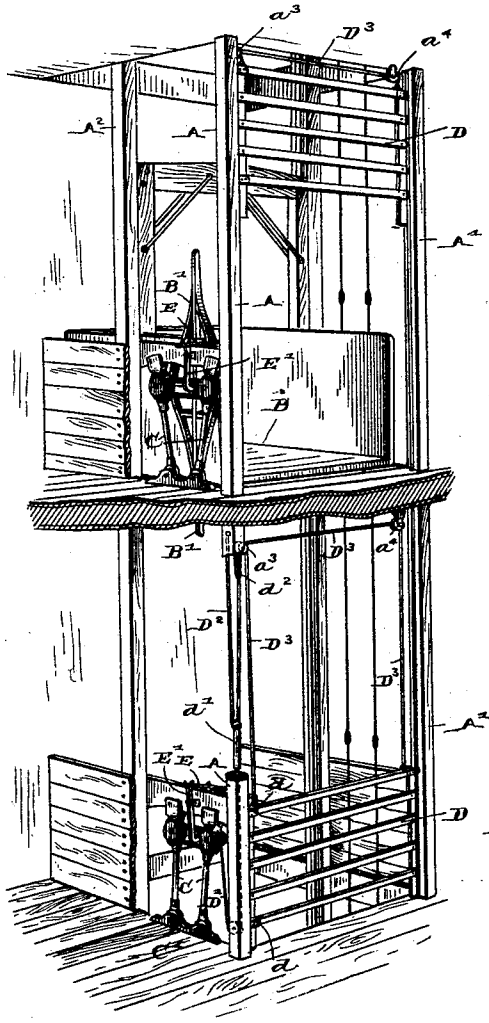
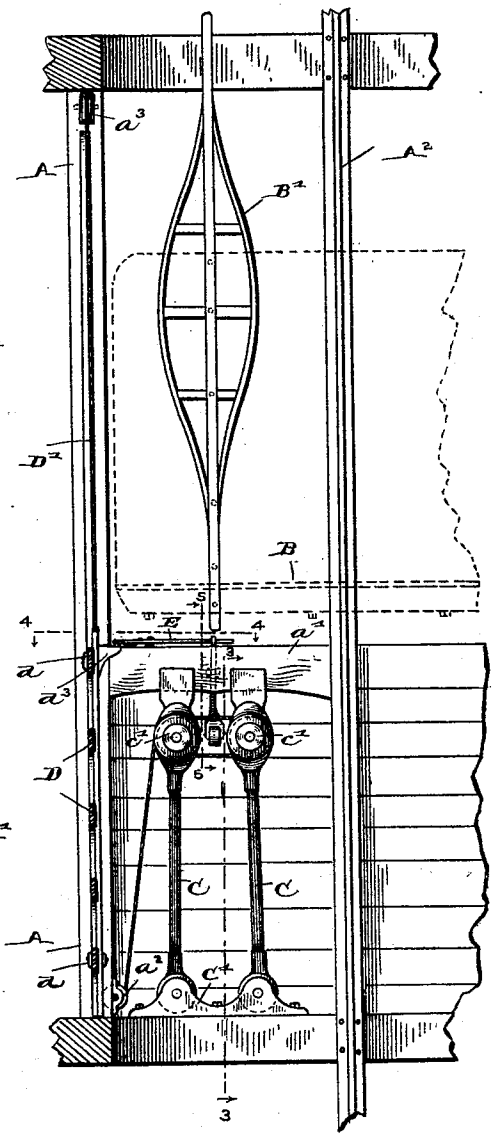


FIG. 2.



WITNESSES:

H. D. Healy.

Frank H. Hood.

INVENTOR

Emory David Toops,

BY

E. T. & W. Burnham,

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

E. D. TOOPS.

ELEVATOR GATE.

No. 482,286. Patented Sept. 6, 1892.

FIG. 3.

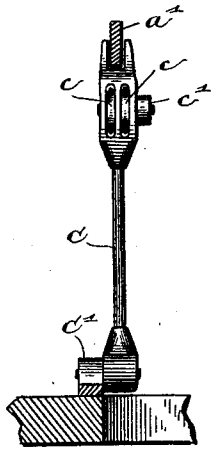


FIG. 7.

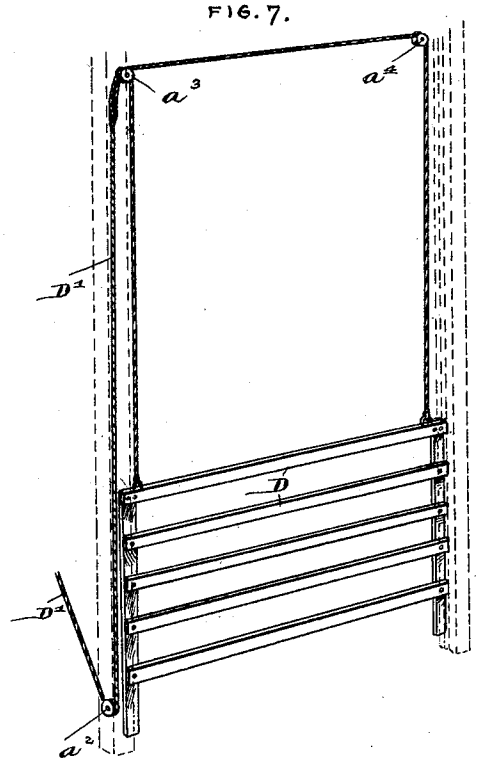


FIG. 4.

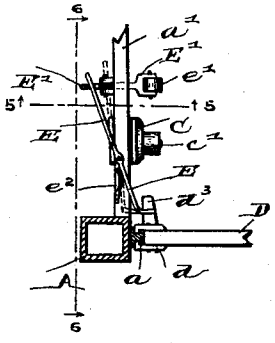


FIG. 5.

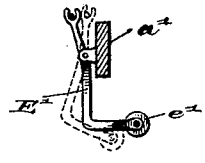
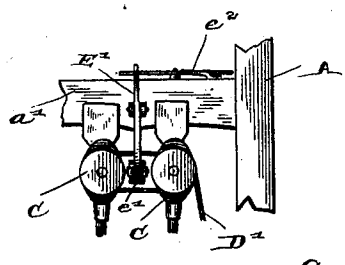


FIG. 6.



WITNESSES:

H. D. Neely.

Frank A. Hood.

INVENTOR

Emory David Toops,

BY

Ed. W. Bradford,

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EMORY DAVID TOOPS, OF INDIANAPOLIS, INDIANA.

ELEVATOR-GATE.

SPECIFICATION forming part of Letters Patent No. 482,286, dated September 6, 1892.

Application filed April 22, 1892. Serial No. 430,215. (No model.)

To all whom it may concern:

Be it known that I, EMORY DAVID TOOPS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Elevator-Gates, of which the following is a specification.

My said invention relates to various improvements in the mechanism for mounting and operating the gates of elevator-hatchways, whereby they are automatically opened as the elevator reaches a position, so that its floor is in substantially the plane of the floor of the building and automatically closed as the elevator moves away from this position.

It further consists in certain mechanism by which the gate is automatically locked when in closed position and automatically unlocked when the elevator reaches a position to open the gate, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view showing two floors of a building through which an elevator-hatchway extends, the elevator being shown at one floor with the gate open, the other gate and its operating mechanism being shown in the closed position. Fig. 2 is an inside elevation of one side of the hatchway, the elevator being indicated in dotted lines and the operating-cam thereon being shown in whole lines, the parts being in the position they occupy just after the elevator has passed or just before it reaches the floor; Fig. 3, a detail sectional view on the dotted line 3 3 in Fig. 2; Fig. 4, a similar view looking downwardly from the dotted line 4 4 in Fig. 2; Fig. 5, a similar view on the dotted line 5 5 in Figs. 2 and 4; Fig. 6, a detail elevation looking in the direction of the arrows from the dotted line 6 6 in Fig. 4, and Fig. 7 a view showing a modified arrangement of the cords by which the gate is hung.

In said drawings the portions marked A, A′, and A^2 represent the posts at the corners and sides of the hatchway; B, the elevator; C, the vibrating stocks arranged in one side of the hatchway; D, the gate, and E the lock.

The post A extends up from the front corner of the hatchway on that side on which the mechanism is located and is preferably formed hollow, with a strip *a* secured on its front face, which is formed with a T-flange, with which clips *d* on one end of the gate engage, as will be presently described. The post A′ is arranged at the opposite corner of the hatchway and is formed with a groove in its side adjacent to the post A, in which the other end of the gate is mounted. The posts A^2 are arranged centrally in each side of the hatchway and are formed with guides on their adjacent faces, on which the elevator is mounted and runs.

The elevator B is or may be of any construction or arrangement desired, the one shown being a common freight-elevator, such as is used in store-houses and similar places. Secured to the outside of one of its sides is a cam B′, which is preferably constructed of a central straight piece having bent or bulged, out pieces secured on opposite sides thereof, which pieces are braced by several cross-pieces arranged as shown.

It will be understood, of course, that the construction of this cam is immaterial, as it might be sawed from a single piece of wood or cast from metal without departing from my invention.

The vibrating stocks C carry sheaves *c*, and each has an antifriction-roller *c′* mounted on its outside, preferably on an extended end of the journal of said sheaves. At their lower ends they are hinged or pivoted in an appropriate housing C′, secured to the floor or other suitably-arranged timber alongside the hatchway. Above the stock proper each is bifurcated or grooved and mounted to slide on a track formed in the under edge of the cross-bar *a′*, which extends between the posts A and A^2 at an appropriate height from the floor. The track for each stock is curved, the curve being the arc of a circle, the center of which is the pintle or pivot on which said stock is hinged or pivoted.

The gate D is or may be of any common or desired construction, one end being mounted in a groove in the vertical post A′ and the other end being provided with clips *d*, which are arranged near the top and lower corners and embrace the T-flange of the strip *a* on the post A, and thus hold the gate steady in its movement up and down, preventing any

uneven movement and the usual binding resulting therefrom. Said gate is connected with the vibrating stock C by means of cords D′, D², and D³. The cord D′ is secured at one end in one of the stocks, then passes to the other stock and around one of the sheaves therein, then back and around one of the sheaves in the stock, to which its end is secured, and then down and under a sheave a^2 in the lower end of the hollow post A and into said hollow post, its other end being connected with a weight d' of substantially the same weight as the gate, which has a sheave mounted in its upper end. The cord D² is fastened rigidly at one end near the top of the post A and passes down and around the sheave in the top of the weight d' and is formed with a loop d^2 in its other end. The cord D³ is passed through said loop and both ends extended out of the hollow post over the sheave a^3, one end being extended down and secured to the corner of the gate adjacent to the post A and the other end being extended across to the other side of the elevator over the sheave a^4 and down and connected to the corner of the gate adjacent to the post A′.

In the construction shown in Fig. 7 I have shown the cord D′ formed with a loop at its upper end and the cord D³ connected directly therewith, which arrangement, while not affording as many advantages as the one just described, yet could be used, if preferred, as will be readily understood.

The lock E consists of a bar or rod pivoted near its center on a pivot e on the top of the cross-bar a', one end being adapted to engage with a catch d^3 on the corner of the gate and the other end extending out and resting between a bifurcated end of a pivoted angle iron or lever E′, which angle-lever is pivoted on the rear side of said cross-bar a' and is bent to extend in to a position between the antifriction-rollers c' on the inside faces of the stocks C, said inner end being formed to have an antifriction-roller e' pivoted therein. A spring e^2 is also mounted on the top of the cross-bar a' and arranged to bear against the bar E and normally press it into engagement with the catch d^3 and lock the gate.

The operation of my said invention is as follows: The cam B′ on the side of the elevator and the stocks C are arranged so that the antifriction-rollers c' thereon will come in contact one with each side of said cam. As the elevator passes to a position approaching the floor, the narrow end of the cam passes between said antifriction-rollers, and the progress of the elevator being continued said cam operates to force said stocks apart, which operates to draw the cord D′ out from the hollow post A and around said stocks, and through the cord D² and cord D³ operates to elevate the gate, as will be readily understood. It will be seen that the number of sheaves in the stocks being multiplied or the width of the cam being increased, the operation will be to take up more of the cord as said stocks spread away from each other, and thus raise the gate to a greater height, it being an easy matter to thus adjust the mechanism so that the gate may be raised just such a height as may be desired, whether it be great or but slight. By the arrangement of the cord shown in Fig. 1 fewer sheaves or a narrower cam are necessary than in the arrangement shown in Fig. 7 to secure the same elevation of the gate, as double the length of the cord D² is withdrawn by the operation than that of the cord D′. As the cam passes between the antifriction-rollers c, the point of its central bar, which is curved at these points, strikes the antifriction-roller e' and throws it back from between these rollers, holding it in this position while the elevator is at this floor or until it has passed, the operation being to also throw the inner end of the bar E in the opposite direction and release its opposite end from engagement with the catch D³ and unlock the gate. After said roller is released by the passing of the gate the spring d^2 operates to throw said catch back, thus locking the gate and preventing any accidents resulting by the opening of the gate when the elevator is not in the hatchway. These locking parts are preferably inclosed in an appropriate casing, (which is omitted in the drawings in order to enable the parts to be shown more clearly,) and any tampering with the lock is thus prevented.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an elevator-gate mounted to slide between vertical posts alongside a hatchway, cords running over appropriately-arranged sheaves and connecting said gate with a pair of stocks pivotally supported at their lower ends alongside the hatchway, and a spreading device mounted on the elevator and arranged to come between said stocks and force them apart as said elevator comes to the proper position, whereby said gate is automatically operated, substantially as set forth.

2. The combination of an elevator-gate, a pair of vibrating stocks arranged alongide the hatchway, cords running over appropriate sheaves and connecting said gate with said stocks, and a cam secured to the side of the elevator and arranged to pass between said stocks, whereby they are spread apart and the gate elevated, substantially as set forth.

3. The combination of the elevator having the cam rigidly secured to its side, a pair of pivoted stocks arranged alongside the hatchway and provided with sheaves and antifriction-rollers, the elevator-gate, and cords running over appropriate sheaves and connecting said gate and sheaves on said vibrating stocks, said cam being arranged to pass between said antifriction-rollers on said stocks and spread them, whereby the gate is operated, substantially as set forth.

4. The combination of the elevator-gate, the

vibrating stocks pivoted or hinged at their lower ends alongside the hatchway and formed to engage with appropriately-formed tracks at their upper ends, cords connecting said gate with said vibrating stocks, and the device secured to the elevator for spreading said stocks, whereby said gate is operated, substantially as set forth.

5. The combination of an elevator-gate arranged to slide in vertical ways, cords upon which said gate is hung, and means for operating said cords so as to raise the gate, one of said cords being connected with the operating mechanism, and the other being fastened securely at one end and extended through a loop or around a sheave on the end of said first cord and formed with a loop in its other end through which the cord which is connected to the gate extends, one end being connected with one corner of the gate and the other end passing to the other side and being connected to the other side of the gate, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 13th day of April, A. D. 1891.

EMORY DAVID TOOPS. [L. S.]

Witnesses:

E. W. BRADFORD,

FRANK W. WOOD.