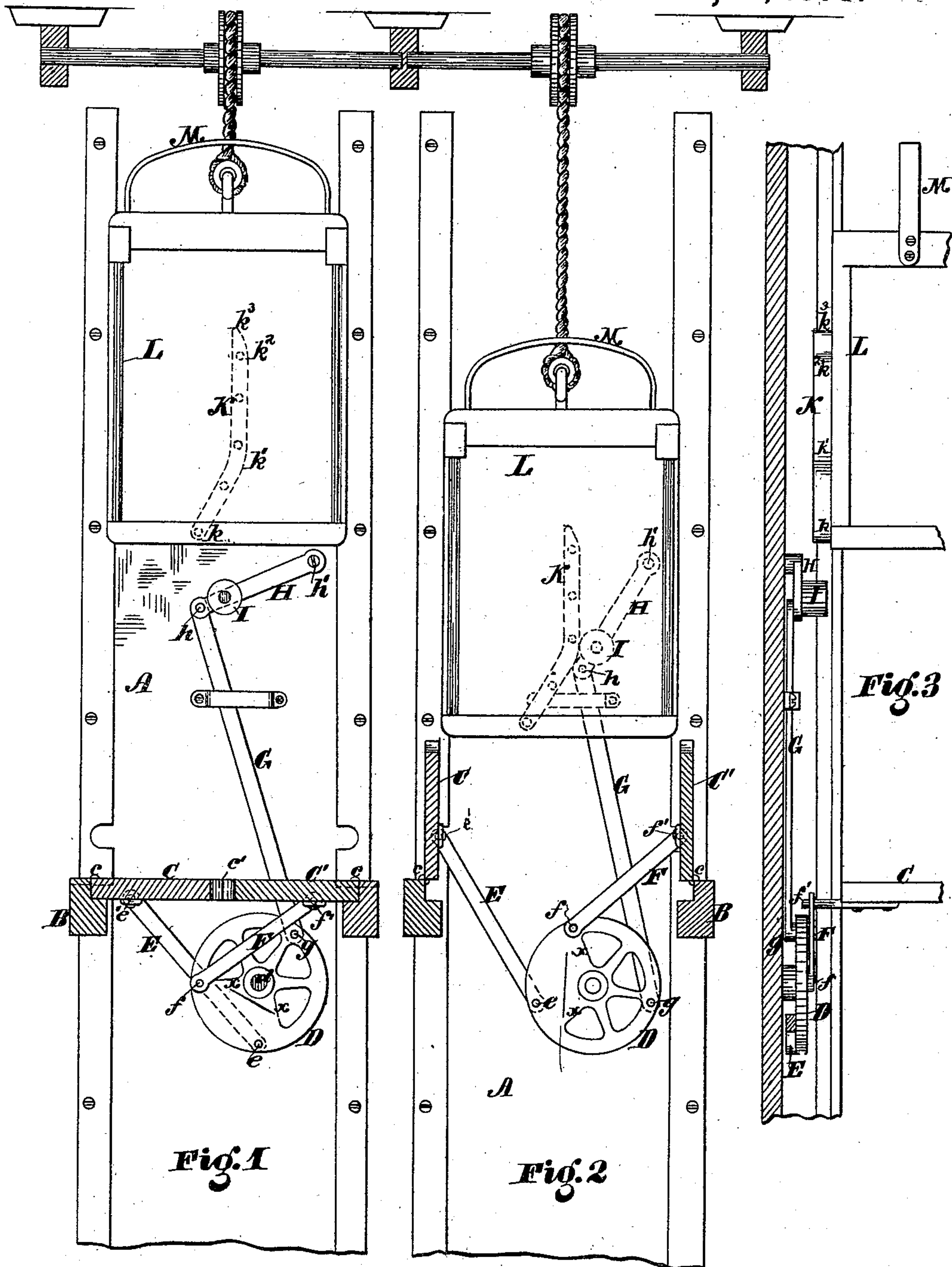


R. F. BANCROFT & J. I. ASHMORE.  
Hatchway Door Mechanism.

No. 205,605.

Patented July 2, 1878.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

REUBEN F. BANCROFT, OF CAMDEN, NEW JERSEY, AND JOHN I. ASHMORE,  
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## IMPROVEMENT IN HATCHWAY-DOOR MECHANISMS.

Specification forming part of Letters Patent No. **205,605**, dated July 2, 1878; application filed April 19, 1878.

*To all whom it may concern:*

Be it known that we, REUBEN F. BANCROFT, of Camden, Camden county, New Jersey, and JOHN I. ASHMORE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Self Opening and Closing Doors for Hatchways; 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, in which—

Figures 1 and 2 are front elevations of a hatchway with our improvements applied, showing doors and operative mechanism in position when closed and opened, respectively; and Fig. 3 is a broken side elevation of the same.

Our invention has for its object to provide a simple, effective, and comparatively inexpensive mechanism for automatically opening and closing the doors of hatchways on the descent and ascent of the platform, car, or cage; and our improvements consist in the peculiar construction, combination, and arrangement of parts hereinafter described, having reference primarily to a wheel which is journaled on the wall of the hatchway, and connected with each of the two folding doors by a separate lever, said wheel being actuated by connection with two other pivoted levers, one of which bears an anti-friction roller, with which an inclined plane or slanting way on the rear side of the platform, cage, or car comes in contact when the latter descends and ascends.

Referring to the accompanying drawing, A indicates a hatchway, and B one of the floors through which it passes. C C' are folding doors, hinged at *c c*, and meeting in the middle of the hatchway at *c'*. D represents a wheel, the axle of which is fastened to the wall of the hatchway at *d*, below the floor B. E and F, respectively, are levers fastened, by pivotal connections at *e* and *f*, to the wheel D, and, by similar connections at *e'* and *f'*, to the doors C C'. G is a long lever pivoted at *g* to the wheel D, and H is a shorter lever pivotally attached to the lever G at *h*, and to the wall of the hatchway at *h'*. I is a roller journaled on

the lever H, above the pivotal connection *h*. K is a rail fastened on the rear side of the car L, forming a slant or incline from *k* to *k'*, and a short curve from the point *k*<sup>2</sup> to the upper end, *k*<sup>3</sup>, ascending vertically between the points *k*<sup>1</sup> and *k*<sup>2</sup>.

The operation is substantially as follows: On the descent of the car the rail K meets the roller I, and pressing upon the same moves the lever G downward and laterally. The downward motion of said lever causes the wheel D to turn on its axle, thereby moving the levers E F upwardly, elevating the doors C C' and opening them fully for the passage of the car. When the car passes through the opened doors the rail K leaves the roller I, so that the levers G H are free to assume their normal position and the doors C C' to close. The doors, in opening having been pushed back slightly beyond the perpendicular, will not close by gravity while in this position. To bring them, therefore, into position where they will close, we construct the wheel D so as to be heavier in the segment indicated by the line *xx* than elsewhere. This may be accomplished by weighting the wheel at this point, or, by preference, in casting the wheel said segment is made solid, while the remainder of the wheel is open or skeleton, with the necessary spokes or arms to connect its rim and hub. As soon as the rail K clears the roller I the weighted wheel D will automatically revolve on its axle, drawing down the levers E F and bringing the doors C C' toward each other sufficiently far to enable them to close by their own weight.

In closing, the doors C C' will come down upon the bow or arch M on the car, and will thus avoid slamming. In ascending, the bow M will meet the doors C C', and, elevating the same, will move the levers as they were moved when the car descended. The roller I will also ride upon the rail K, and as it does not leave said rail until the doors have closed, the slamming of the latter after the ascent of the car is also avoided.

What we claim as our invention is—

1. In combination with the folding hatchway-doors C C', the wheel D and levers E F, arranged and operating substantially as shown and described.

2. In combination with the wheel D, the levers G H, substantially as shown and described.

3. In combination with levers G H and roller I, the car L and inclined rail K, substantially as shown and set forth.

4. The combination of doors C C', wheel D, and levers E F G H, substantially as shown and described.

5. The combination of doors C C', wheel D, levers E F G H, roller I, and rail K on car L, substantially as shown and described.

6. In combination with folding doors C C' and levers E F, the wheel D, weighted or formed heavier at one side than on the other, substantially as and for the purpose set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 16th day of April, 1878.

REUBEN F. BANCROFT.

JOHN I. ASHMORE.

Witnesses:

M. D. CONNOLLY,

CHAS. F. VAN HORN.