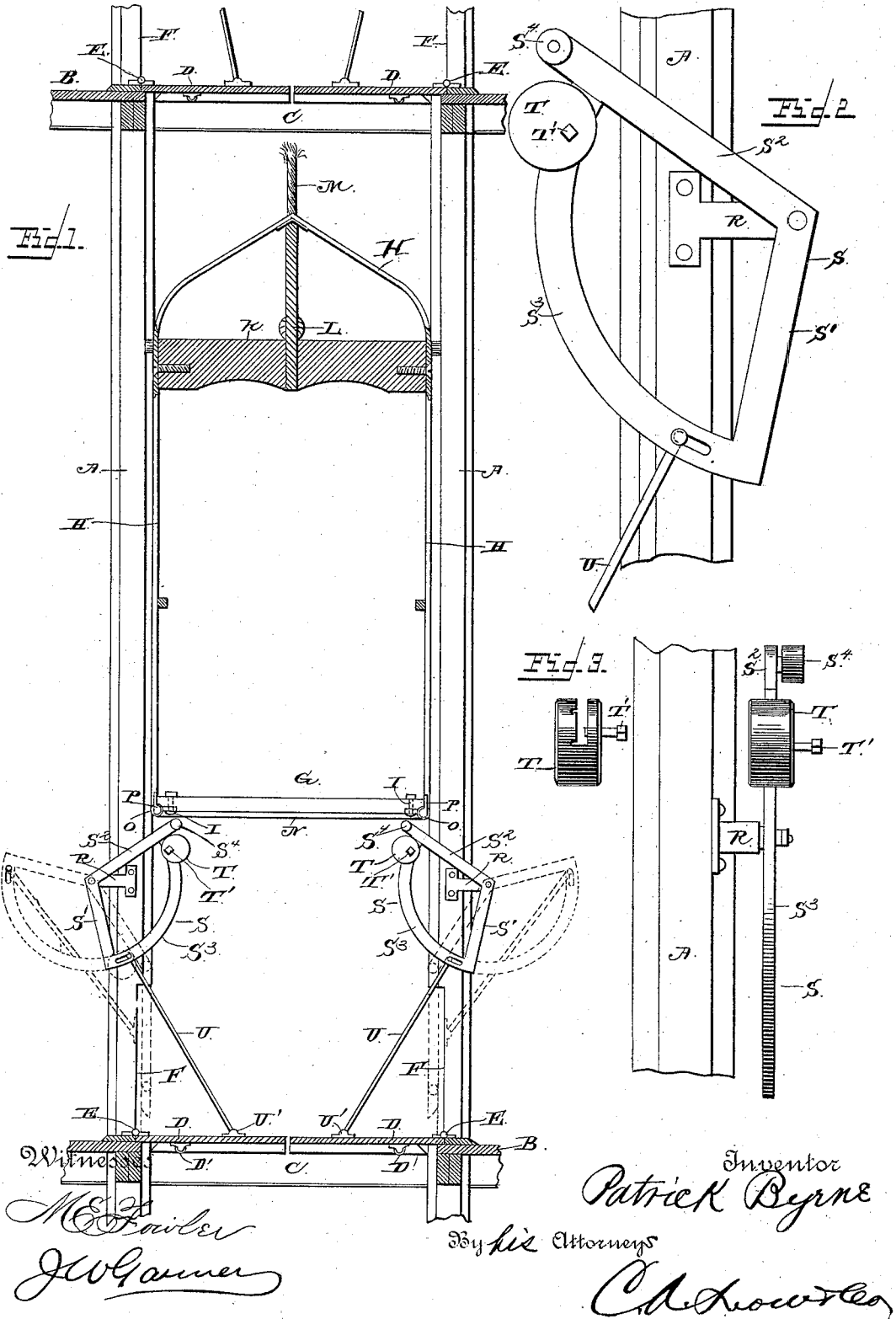


(No Model.)

P. BYRNE.
HATCHWAY OPERATING DEVICE.

No. 365,791.

Patented July 5, 1887.



UNITED STATES PATENT OFFICE.

PATRICK BYRNE, OF NASHVILLE, TENNESSEE.

HATCHWAY-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 365,791, dated July 5, 1887.

Application filed July 23, 1886. Serial No. 202,877. (No model.)

To all whom it may concern:

Be it known that I, PATRICK BYRNE, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful Improvement in Hatchway-Operating Devices for Elevators, of which the following is a specification.

My invention relates to an improvement in elevators, and more particularly to the hatchway-doors of the same; and the object of my invention is to provide balanced elevator-doors for the hatchway and mechanism for automatically opening and closing the same as the elevator ascends or descends; and my invention consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claim.

In the drawings, Figure 1 is a vertical sectional view of an elevator provided with balanced automatically-operating hatchway-doors embodying my improvements. Fig. 2 is an enlarged detail view of one of the operating-arms. Fig. 3 is a detailed end elevation of the same.

A represents the usual vertical guide-posts.

B are the floors, C the hatchways, and D are the doors to close the hatchways, the said doors being pivoted or hinged at their outer edges to the sides of the hatchway, as at E, and meeting at their inner edges centrally in the hatchways when the doors are closed, as shown in the lower portion of Fig. 1.

On the inner sides of the vertical posts A, immediately above the hatchways, are made vertical recesses F, which are of sufficient height to admit and receive the doors D when the latter are open, as shown by the dotted lines in Fig. 1, so that the inner sides of the doors will be flush with the inner sides of the posts.

G represents the elevator cage or platform, the sides of which that bear against the inner sides of the posts are provided with vertical metallic straps or tracks H. The lower ends of the said tracks are bent under the bottom of the cage or platform, and are secured thereto by means of vertical bolts I, and the said tracks extend above the cross-beam K at the upper end of the cage or platform, incline upwardly from the ends of the said beam, and meet

directly over the center thereof, as shown. A vertical brace-bar, L, extends upwardly from the beam K, and is connected to the central portion of the strap or guide above the cage.

M represents the elevating-rope, which is operated by the usual well-known mechanism to raise or lower the cage. Extending across the bottom of the cage is a guide-track, N, and at the ends of the said track, at the sides of the bottom of the cage, are journaled anti-friction rollers O, which are mounted in suitable frames or castings, P.

At a suitable distance above each hatchway and to the posts A are secured outwardly-projecting horizontal brackets R, to the outer ends of which are pivoted segmental rocking lever-arms S, the said arms having sides S' and S² arranged at an angle of about sixty degrees with relation to each other, and connected by a curved side, S³. The side S² projects slightly beyond the curved side S³, and is provided with an anti-friction roller, S⁴.

T represents a circular weight, which is slotted on one edge, and is thereby adapted to be fitted to the curved side of the lever-arm, and is provided with a set-screw, T', the function of which is to firmly secure the weight to the said side of the lever-arm. Near the point where the sides S' and S³ of the lever-arms meet is attached a connecting-rod, U, which extends to one of the folding doors and is connected thereto, as at U'.

The operation of my invention is as follows: The doors D are normally closed in a horizontal position over the hatchways, and the upper portions of the curved sides S³ and of the angular sides S² of the lever-arms project inwardly from the guide-posts into the vertical path traversed by the cage or platform. When the latter is elevated, the guide at the upper end of the cage strikes against the under sides of the doors, raising them to a vertical position and forcing them into the recesses F of the guide-posts. The said doors are provided on their under or inner sides with anti-friction rollers D', which bear against the guide or strap H.

It will be noted that the operation of opening the doors to a vertical position causes the rocking levers S to be moved through a quarter of a circle, thereby causing them to be entirely withdrawn from the inner sides of

the guide-posts, so as not to project into the pathway of the cage. When the lever-arms are in this position, their friction-rollers S⁴ are just flush with the inner sides of the guide-
 5 posts, and as the cage continues to rise the strap H bears against the said rollers and keeps the levers R in that position, so as to cause them to keep the doors open until the vertical track of the cage entirely clears the rollers S⁴.
 10 It will be observed that when the doors are in a horizontal position the levers S project inwardly, thereby throwing all their weight upon the inner sides of their fulcrums, and that the rods U are attached slightly beyond the outer
 15 sides of the fulcrums, thereby causing the projecting inner portions of the levers to counterbalance the doors. The weights T, which are attached to the levers, may be of any necessary weight, in order to cause the levers to
 20 exactly counterbalance the doors, as the weight of the doors for the hatchways of elevators varies in different cases. As soon as the ascent of the cage or platform brings the rollers S⁴ to the bottom thereof, the weight of the le-
 25 vers S causes them to reverse their movement and partly close the doors. The rollers S⁴ remain in contact with the bottom of the cage, and continue to bear and travel under the track N of the cage during a portion of the
 30 distance traversed by the cage, thus causing the doors to be closed gradually and at a speed exactly equal to the speed of the elevator. This prevents the doors from closing the hatchways with a bang, and thus avoids noise, and

also prevents the machinery from being in- 35
 jured by the jar and concussion. This operation is repeated at each floor during the ascent of the cage. When the latter descends, the track N on the bottom of the cage first strikes 40
 upon the rollers S⁴ of the rocking levers, causing the levers to be moved to the position indicated by dotted lines in Fig. 1, and thereby opening the doors to permit the cage to pass through the hatchway. While the cage is 45
 passing through the hatchway, the rollers D' of the doors bear against the vertical straps H, thereby keeping the doors open, and when the upper inclined portions of the strap reach the said rollers they cause the doors to be gradually closed, as before. 50

Having thus described my invention, I claim—

The combination, with the elevating cage or platform G, of the pivoted segmental rock- 55
 levers S, comprising the arms S¹ S² and curved arms S³, the arms S², projecting into the path of the cage or platform, the weight T, adjustable along the curved arms S³, and the rods U, connecting the doors with the arms S³, as set forth. 60

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

PATRICK BYRNE.

Witnesses:

SAM E. HARRISON,
 H. B. GRAY.