

UNITED STATES PATENT OFFICE.

ALEXANDER J. BLAIKIE, OF STERLING VALLEY, NEW YORK, ASSIGNOR OF ONE-HALF TO JOHN HUNTER, OF SAME PLACE.

AUTOMATIC HATCHWAY FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 370,308, dated September 20, 1887.

Application filed June 7, 1887. Serial No. 240,551. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER J. BLAIKIE, a citizen of the United States, residing at Sterling Valley, in the county of Cayuga and State of New York, have invented new and useful Improvements in Automatic Hatchways for Elevators, of which the following is a specification.

My invention relates to automatic devices for opening and closing elevator-hatchways and for securing the closed hatches until the approach of the car or platform.

The invention consists in the combination, with a hinged hatch, of levers pivoted in the elevator-well above and below each floor, and connected with the hatch, and cams mounted on said levers to engage inclined guideways on the car and operate the hatch as the car approaches or leaves each floor.

The invention also consists in the combination, with the car and hinged hatch, of brackets operated by the car to secure or release the hatch as the car passes.

The invention further consists in the construction and combination of the automatic devices for operating and supporting the hatches of an elevator, as hereinafter more fully set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical sectional view of an elevator-car, its passage-way, and two floors of a building, the car being shown in position above the closed safety-hatches of a lower floor and in the act of passing between the opened hatches of an upper floor. Fig. 2 is a side view of the same, showing one of the guide-posts of the elevator-well, with a section of the car and the mechanism for securely supporting the hatches in a closed or horizontal position.

The reference-numeral 1 designates one of the side posts or vertical guide-standards of an elevator which has the customary openings or hatchway-approaches to the floors 2 of the building. In these approaches or openings are arranged the horizontal doors or hatches 3, which are pivoted or hinged in pairs to the opposite side walls of the elevator-well, and are designed, as usual, for closing said well when the elevator car or platform 4 is not occupying the place of said hatches by being

opposite to or passing one of the floors of the building.

On one of the side walls of the elevator-well at or near the points where the safety-hatches are located, are pivoted the levers 5, through which the hatches are automatically opened by the passing car. These levers 5 are arranged in pairs, one for each half or leaf of the double hatches, as shown.

It will be seen that one lever 5 in each pair is pivoted above the floor, while the other lever is pivoted below the floor. These levers are pivotally connected by a slot, 19, in one engaging a pivot-pin, 20, on the other, which pin also connects them with one end of a bar, 6, that is pivoted at the other end to an arm, 7, which is rigidly secured to one corner of the hatch near its hinged edge. It will be observed that the engagement of the lever 5 by means of a slot, 19, and pin 20 is such as to enable them to move freely back and forth in operating the hatches, as hereinafter set forth.

To the extreme ends of the levers 5 are pivoted double wedge-shaped blocks or cams 8, which are designed to travel through suitable guideways, 21, formed in or attached to the car-frame, so as to move the levers 5 back and forth, thereby raising and lowering the hatches 3 as the car approaches or leaves each floor.

The guideways 21 are preferably formed by means of double inclines 9 and self-adjusting guides 10, arranged, as shown in Fig. 1, at the top and bottom of the car. The double incline 9 is made of any suitable material, and any slant that may be desirable to suit the speed of the car. These double inclines may be firmly secured to the car by suitable braces, or they can be attached securely to the boarding or panel work 16, that may be attached to the end of the car. Parallel with and adjacent to the outer sides of the inclines 9 are placed the self-adjusting guides 10, which are pivoted near one end and arranged to yield slightly to the passage of the cams 8 through the guideways 21, as hereinafter explained.

It will be seen that the upper ends of the upper guides 10 and the lower ends of the lower guides 10 are curved outward away from the double inclines to facilitate the engagement and disengagement of the cams 8 on the

hatch-actuating levers. The opposite ends of said guides 10 project a sufficient distance beyond the plane of the inclines 9, so that the points of the double wedge-shaped cams 8 will be turned into the guideways 21 as the car recedes from the hatches, yet not far enough but that the said cams will pass over said guides when the latter are approaching curved ends first.

The guides 10 are pivoted near their curved ends, and are provided with suitable springs, 11, which bear on stops or supports that are secured to some part of the car-frame. The guides 10 are thus normally held in proper position, and are yet free to yield somewhat to allow the cams 8 to pass by them without going through the ways 21.

To the side posts, 1, at a suitable distance below the hatch, are pivoted brackets 14, for supporting the hatches when closed. These brackets are normally forced outward into engagement with the closed hatches 3, and on the approach of the elevator-car they are automatically retracted by means of angle-levers 15, trip-levers 13, and intermediate connecting-rods 22 23, as shown, said trip-levers being depressed by a double incline, 12, on the car-frame.

As the elevator car or platform approaches a closed hatchway the double incline 12 comes in contact with one of the trip-levers 13, and through the angle-levers 15 and connections 22 23 retracts the brackets 14 to release the hatches. At the same time the curved ends of the guides 10 engage the adjacent pivoted cams 8 and cause the same to pass through the guideways 21 as the car moves outward, thus causing the pivotally-connected ends of the levers 5 to move toward the guide-post, and through the connecting-bar 6 and arm 7 actuate the hatches in such a way as to cause them to open for passage of the car. After passing through the guideways 21 at one end of the car-frame, the cams 8 travel along the straight surfaces 24, that connect the upper and lower double inclines 9, and then pass by or over the approaching guides 10 without going through the adjacent guideways, said guides yielding slightly under the pressure of the cams. The instant the car has cleared the hatches the next cams 8 in succession, which have passed over or by one set of guides 10 without engaging the adjacent guideways, will engage the guideways at the receding end of the car, and by traveling through the same will actuate the levers 5, so as to cause the connecting-bars 6 and arms 7 to close the hatches. When the doors or hatches 3 are closed and the inclines 12 have passed the trip-levers 13, the springs 18 force the brackets 14 outward in position to support the hatches securely until they are again automatically opened by the approaching car.

To keep the corner of the hatch opposite the one to which the arm 7 is attached from sagging and preventing the supporting-brackets 14 from catching under the hatch while being raised, I may employ a cord, pulley, and weight attachment, 25, as shown in Fig. 1; but this is not essential.

Having thus described my invention, what I claim is—

1. In an automatic elevator-hatchway, the combination, with each hinged hatch, of two levers pivoted in the elevator-well, one above the floor and one below the floor, said levers being pivotally connected at one end and provided at their other ends with cams to engage guideways on the elevator-car, and a bar connecting the pivoted ends of said levers to a rigid arm on the hatch, substantially as described.

2. The combination, with a hinged hatch and an elevator-car having inclined guideways, of an arm rigidly secured to said hatch, two actuating-levers pivoted in the elevator-well, one above and the other below the floor, said levers being pivotally connected, a bar connecting the pivotal ends of said levers to the rigid arms on the hatch, and a double wedge-shaped cam pivoted to the free end of each lever and adapted to engage the inclined guideways of the elevator-car, substantially as described.

3. The combination, with a hinged hatch and an elevator-car having a double incline, 12, on its side, of a pivoted bracket adapted to support the closed hatch, a spring for pressing said bracket into engagement with the hatch, a trip-lever, an angle-lever, and rods connecting said trip-lever with the angle-lever and the angle-lever with the bracket, substantially as described.

4. The combination, with an elevator-car, of the double inclines 9 and the yielding guides 10, carried by said car, and the levers 5, provided with cams 8 and connected with the elevator-hatches, substantially as described.

5. The combination of the hatches 3, having rigid arms 7, the levers 5, provided with cams 8, the connecting-bars 6, and the elevator-car having double inclines 9 and yielding guides 10, substantially as described.

6. The combination of the automatic hatches 3, the elevator-car having double incline 12, the pivoted brackets 14, angle-levers 15, trip-levers 13, and connecting-rods 22 and 23, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALEX. J. BLAIKIE.

Witnesses:

S. GERTRUDE CROSSMAN,
E. A. CROSSMAN.