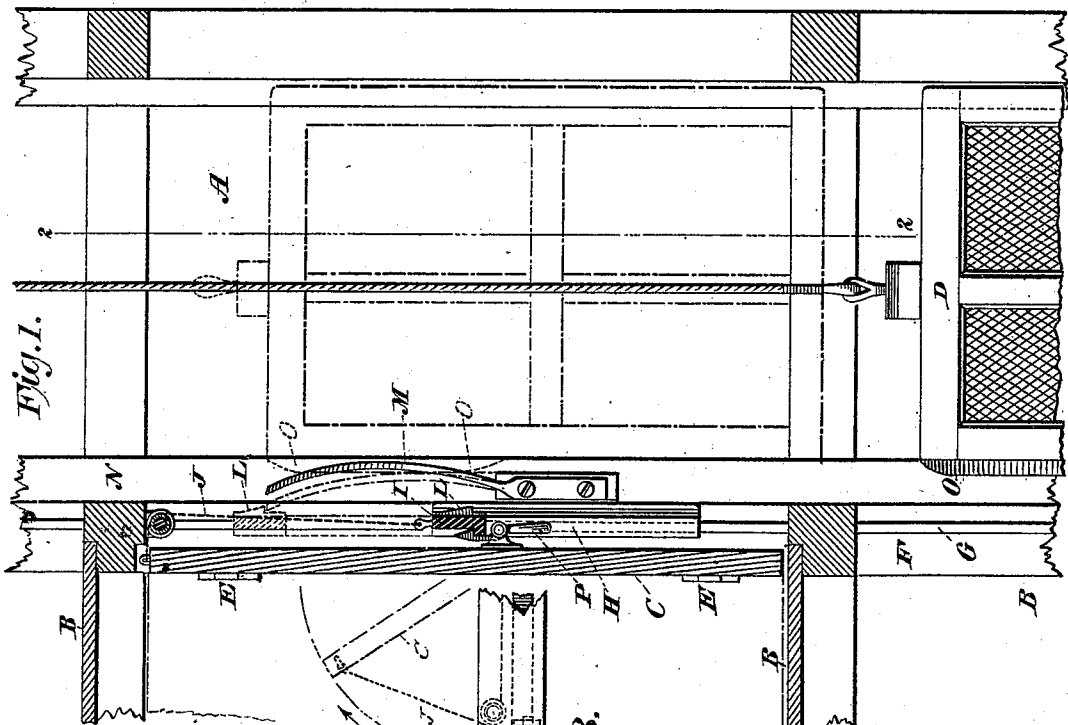
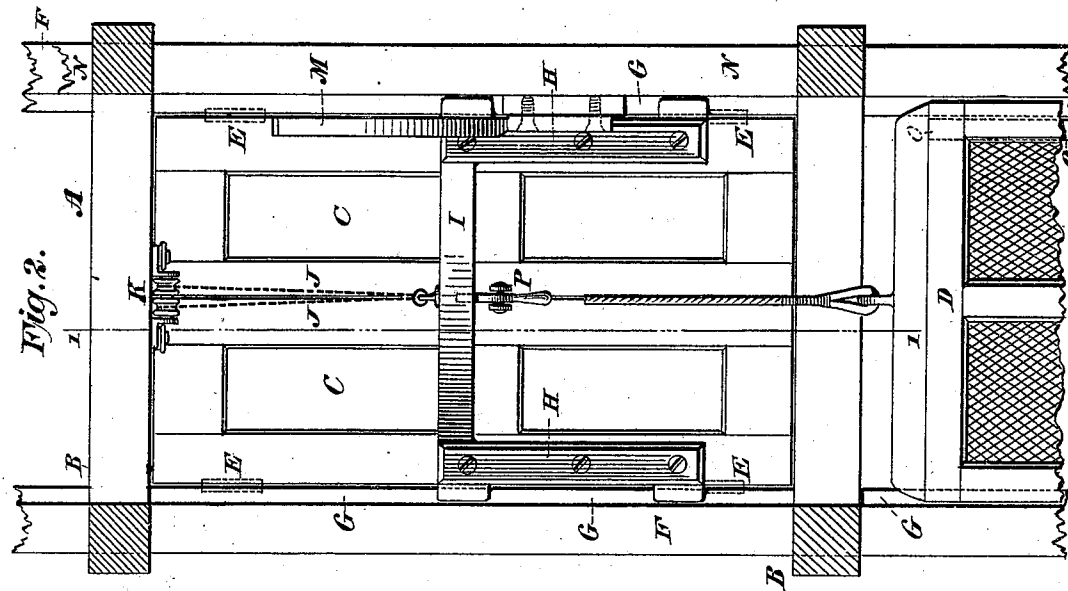


(No Model.)

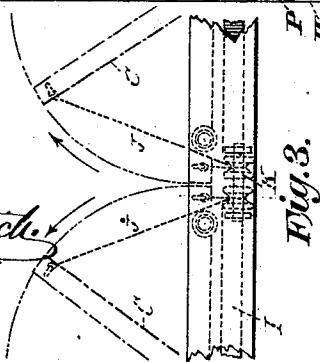
W. K. CROFFORD & W. BARDSLEY.
DOOR MECHANISM FOR ELEVATOR SHAFTS.

No. 516,699

Patented Mar. 20, 1894.



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UNITED STATES PATENT OFFICE.

WARREN K. CROFFORD, OF NEW YORK, N. Y., AND WILLIAM BARDSLEY, OF KEARNEY, NEW JERSEY.

DOOR MECHANISM FOR ELEVATOR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 516,699, dated March 20, 1894.

Application filed June 28, 1893. Serial No. 479,076. (No model.)

To all whom it may concern:

Be it known that we, WARREN K. CROFFORD, a resident of New York, in the county of New York and State of New York, and WILLIAM BARDSLEY, a resident of Kearney township, Hudson county, New Jersey, citizens of the United States, have invented certain new and useful Improvements in Door Mechanism for Elevator-Shafts, of which the following is a specification.

The invention relates to improvements in door mechanism for elevator shafts; and consists in novel means hereinafter described and claimed whereby the vertical hinged doors of elevator shafts may be automatically closed as the elevator carriage or hoist passes from one floor to another of the building.

The invention pertains particularly to the doors of fireproof elevator shafts, which doors are hinged at their vertical edges and extend the full distance between the floors of the building, so that the series of doors up through the building will, when closed, effectually close the shaft. It is essential to the safety of both life and property that the shaft doors be closed at all times except when during the operation of the carriage or hoist it is necessary to stop at the various floors of the building and take on or discharge freight or passengers.

In accordance with my invention the doors will remain closed until the attendant in the carriage or on the hoist on arriving at any special floor shall physically open the doors opposite to the carriage or hoist, and thereafter as the carriage leaves the floor to ascend or descend to another floor the said doors will automatically close and remain closed until again intentionally opened. The attendant in the carriage or on the hoist is not required to pay any attention to the doors after they have once been opened, since they will close automatically as the carriage or hoist passes on, and this is a feature of importance for the reason that time is thereby saved and possible accident averted.

The invention will be more fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section, on the dotted line 1—1 of Fig. 2, through an elevator shaft

employing doors and mechanism constructed in accordance with and embodying the invention. Fig. 2 is a like section of same on the dotted line 2—2 of Fig. 1, and Fig. 3 is a detached top view looking downward on the beam over the doors and showing by dotted lines the position of the pulleys and doors.

Referring to the accompanying drawings A designates the elevator shaft; B the various floors of the building; C the vertical doors extending between the floors B, and D the elevator carriage or hoist.

The doors C are for convenience arranged in pairs and secured at their vertical outer edges by hinges E.

At opposite sides of the door frame are beams F having vertical guides G, upon which are arranged to have a vertical movement the blocks H at opposite ends of the bar I, which extends across the doorway at the inner side of the doors C and is suspended by the chains J which extend upward over pulleys K, and are secured to the inner edges of the doors. When the transverse bar I, with its blocks H, is in its lower position, shown in Fig. 2, its weight will exert a pull against the doors C and hold them closed. The bar I, and blocks H, may be of any suitable material and dimensions, and since their purpose is primarily to constitute a weight pulling on the doors to close them, the invention is not in every instance confined to their form and dimensions, nor to the transverse bar and blocks in preference to other well known kinds of weights. The transverse bar I, when used for the weight performs a service hereinafter explained in addition to pulling on the doors, and hence the bar in the combination with other elements, as claimed, constitutes a part of our invention.

Upon the end of the bar I, is formed or secured the shoulder or catch L, shown in Fig. 1, which shoulder or catch when the bar I, is in its upper position, shown by dotted lines, is engaged by the spring M, which is secured to the beam N, and has a normal tension outward from the doors. Upon the carriage or hoist D, is the projection or cam O, which is in line with the spring M and comes into contact with and presses the said spring inward as the carriage or hoist reaches its position

opposite to the doors, as shown by dotted lines in Fig. 1.

It may be assumed, for purposes of explanation, that the carriage or hoist is ascending from the position shown by full lines in Fig. 1, to that indicated by dotted lines; on reaching the latter position the carriage will come to a stop and the projection or cam O will have moved against the spring M, and pressed it inward to the position shown by dotted lines. The attendant in the carriage will then push the bar I, upward on its guides G, until the catch L, moves over and is caught by the upper end of the spring M, which being held at its inward position by the cam O, will retain its contact with the catch L, and support the bar or weight I, in its upper position, thus relieving the pull from the doors and permitting the latter to be freely pushed open. After the freight or passengers have been removed or passed from the carriage or hoist, the latter may as usual either ascend or descend, thus carrying the cam O, from contact with the spring M, which being relieved will spring outward free of the catch L, and permit the bar or weight I, to descend to its lower position and close the doors. The doors C are thus automatically closed by the moving away of the carriage or hoist, and are only opened by first relieving the weight therefrom.

In order that the doors C may only be opened from within the shaft, the locking catch P is provided to engage a shoulder on the weight or bar I, as soon as the latter lowers to position. The bar I, is thus locked in its lower position from within the shaft, and the doors thereby prevented from being pulled open from without the shaft.

The springs M are in line with each other up through the elevator shaft, and hence the one cam O on the carriage or hoist will answer for contact with any one of the springs. As long as the cam O is against the spring, and the end of the latter is against the catch L, the bar or weight I, will be prevented from descending, and hence at the close of day the carriage having been stopped for the night, the last doors opened to permit the exit of the attendant will be closed by hand.

During the ascent and descent of the elevator carriage the cam O will successively meet and press inward the springs M, but this will have no effect on the doors unless the carriage is stopped and the attendant actually elevates the weight to position to be supported by the spring and thereby relieve the doors.

In practice we recommend that the catch L, or cam O, or both catch and cam, be made of fusible metal, in order that if by accident or otherwise the doors through which the attendant makes his exit at the close of day should not have been closed, and a fire should occur, the heat would melt the catch or cam, or both, and thus permit the weight or bar I, to descend and securely close the doors. If

the cam O, or that portion thereof which acts on the spring M were of fusible metal, it would be unnecessary to have the catches L, of fusible metal also, since the melting of the cam at any floor of the building would operate to release the support for the bar or weight I.

Where the bar I, is made use of as a weight, instead of using some of the many ordinary forms of weights, it will, when released from the spring support, move downward across the doorway and while descending serve to prevent any person who might be within line of the doors from being swept into the elevator shaft.

From the foregoing description it will be noticed that the doors C remain closed at all times except when the weight is relieved therefrom, and the doors pushed open, and that the doors are closed automatically by the withdrawal of the support from the weight due to the carriage moving onward up or down the elevator shaft.

The doors C, are illustrated in the drawings as being the usual double doors, but, of course, the invention is equally applicable to single doors.

Without limiting ourselves to the details of construction, what we claim as our invention, and desire to secure by Letters Patent, is—

1. The elevator-shaft door hinged at its vertical edge, the weight for closing the same, and the flexible connection intermediate the said weight and door, the said weight being exposed within the elevator shaft and in position to be elevated by the hand of the attendant within the elevator carriage for the purpose of slackening said flexible connection to permit the door without resistance from the weight to be pushed open by the attendant, combined with the support for the weight when elevated, said support being normally out of its operative position, and the cam on the carriage, which acts when the carriage is at the floor to move the support into its operative position; substantially as and for the purposes set forth.

2. The elevator shaft door hinged at its vertical edge, the weight for closing the same, and the flexible connection intermediate the said weight and door, the relation of the parts being such that when the weight is elevated the door is left free to be turned on its hinges at will, combined with the support for the weight when elevated, said support being normally out of its operative position, the cam on the carriage which acts when the carriage is at the floor to move the support into its operative position, and a catch for locking the weight in its lower position when the door is closed; substantially as and for the purpose set forth.

3. The elevator-shaft door hinged at its vertical edge, the bar extending transversely across the door-opening for closing said door, and the flexible connection intermediate the said bar and door, the relation of the parts

being such that when the bar is elevated the door is left free to be turned on its hinges at will, combined with the support for the bar when elevated, said support being normally
5 out of its operative position, and the cam on the carriage, which acts when the carriage is at the floor to move the support into its operative position, substantially as and for the purpose set forth.

Signed at New York, in the county of New York and State of New York, this 24th day of June, A. D. 1893.

WARREN K. CROFFORD.
WILLIAM BARDSLEY.

Witnesses:

CHAS. C. GILL,
ED. D. MILLER.