(No Model.)

J. LITTLE.

ELEVATOR.

No. 457,479. Patented Aug. 11, 1891.

Fig. 1.

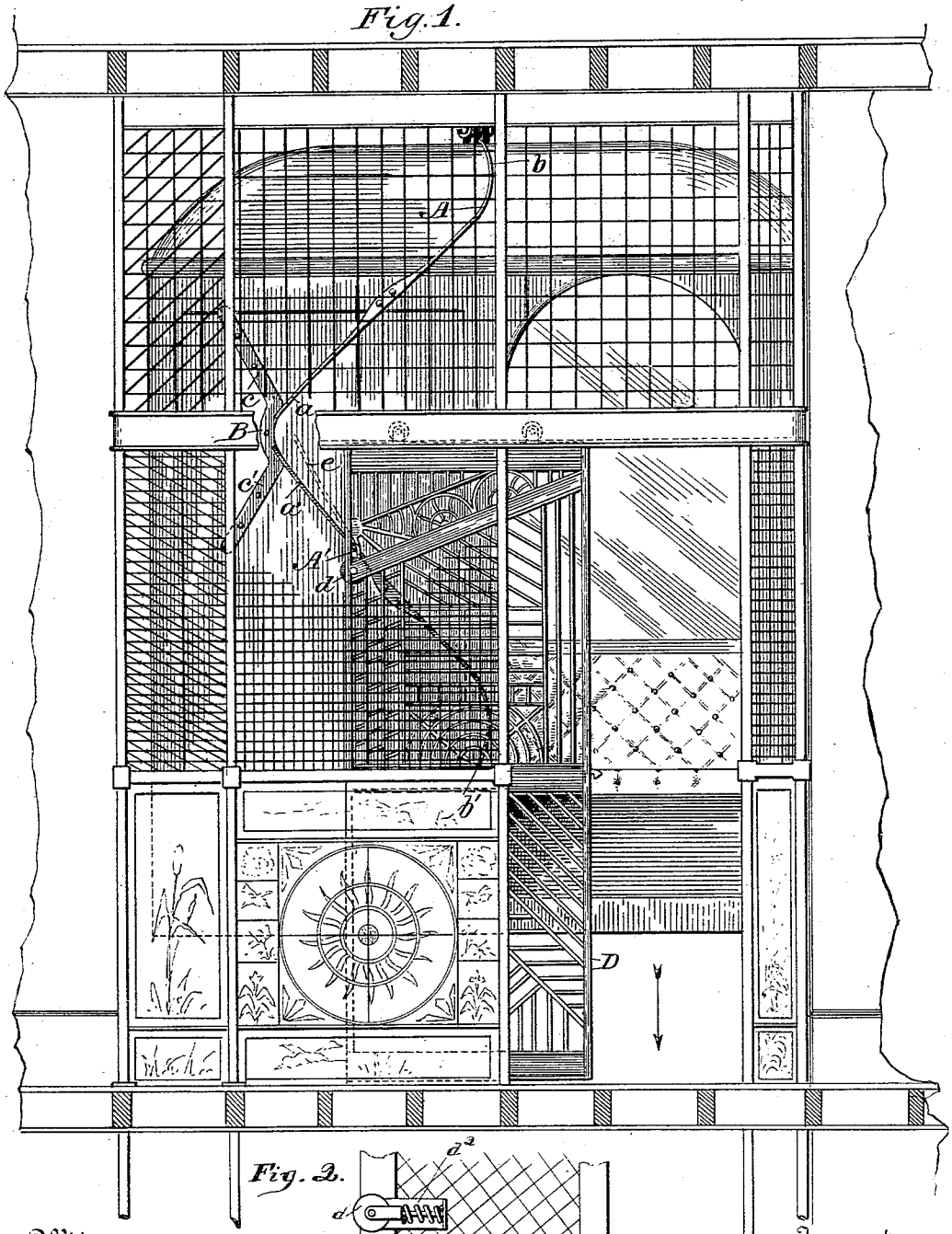


Fig. 2.

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

UNITED STATES PATENT OFFICE.

JOHN LITTLE, OF XENIA, OHIO.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 457,479, dated August 11, 1891.

Application filed January 23, 1891. Serial No. 378,842. (No model.)

To all whom it may concern:

Be it known that I, JOHN LITTLE, a citizen of the United States, residing at Xenia, in the county of Greene and State of Ohio, have invented certain new and useful Improvements in Safety Devices for Elevators; and I 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 appertains to make and use the same.

My invention relates to improvements in devices for closing the doors of elevators, particularly that class of elevators used for passenger service; and the objects of my improvements are to provide mechanism for automatically closing the doors of elevator-wells when the same are left open, either through accident or carelessness on the part of the operator or attendant, (except at such times as may be necessary to have the doors open for ingress or egress,) and thereby avoid accidents, which frequently occur when doors of elevators are not properly closed by the operator before commencing to ascend or descend the elevator-shaft. It is not my purpose, however, to dispense with the usual duties of the operator in regard to closing the doors, but merely to insure the closing of doors when the same are improperly left open. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a front view of an elevator-shaft partly broken away, showing the door of the well or shaft partly open and the cage descending. Fig. 2 is a detail illustrating the method of attaching the spring-pressed roll to the door of the elevator-shaft.

In the accompanying drawings, A A′ represent two spring-metal plates or guides attached to the traveling cage of the elevator in oppositely-inclined positions in the manner indicated in Fig. 1. These plates may be secured at their central portions to the cage by means of any suitable fastening device, and their inner converging ends *a a′* are adapted to rest against the main portion of the bracket B at a point back of the doorway the full width of the door, while the other outer curved ends *b b′* project to a point substantially in line with the rear edge of the door when the latter is closed, whereby the door may be thrown open its full width at any landing or floor of a building without coming into contact with the guides. On either the up or down movement of the cage a projection or guide-roll *d*, attached to the door, will be engaged by one of the spring plates or guides, and thereby the door will be closed as the cage ascends or descends. The bracket B has two arms *c c′*, which extend from the main portion thereof at an acute angle to the guides, as shown, for a purpose hereinafter described. By this construction, in the event that the door of the elevator-shaft is left open when the cage is above or below the doorway on either the upward or the downward movement of the cage, the projecting stud or friction-roll *d*, fixed to the door, will come into contact with the outer side or back of the guide A or A′, as indicated in Fig. 1, and, traveling along said guide, will cause the door to slide backward therewith until the roll strikes the arm *c* or *c′* of the bracket B, whereupon the roll will force the spring portion *a* or *a′* of the guide away from the bracket, as indicated in dotted lines at *e*, and pass between such parts to the inner side or front of the guide A or A′, and, continuing its course along such inner side of the guide, will gradually close the door as the cage continues to move either up or down. At the moment that the roll has escaped from behind the guide-plate the door will have been opened to its full extent, and the cage will then be in a position for the ingress or egress of passengers, so that it may be stopped at that point, and when the cage is again started in either direction, if for any cause the operator should neglect to first close the door, the roll will be engaged by one of the guides and the door will be gradually moved forward and closed in the manner described. The ends *b b′* of the guides are preferably made in the form of a flat curved spring, so as to yield slightly when first engaged by a fixed stud or roll, and also for the purpose of allowing the same to spring back under an abnormal pressure, in excess of the pressure required to close the door in the event that any obstruction should prevent the same from closing, and the stud or roll *d* may be mounted upon a spring-pressed stem or shaft, as at d^2, Fig. 2, so as to afford a yielding resistance between the guide and

the roll when these parts first engage each other, and also for the purpose of yielding to obstructions which may prevent the door from closing, whereby injury or breakage of the parts will be prevented. It will thus be seen that with the described arrangement of guides and roll the cage will not be permitted to pass a landing at which there may be an open door without closing the same in passing, and that in leaving any landing after a stoppage the door will be automatically closed if the operator should neglect to close the same. As the cage approaches a landing at which the door stands ajar or partly open, the door will first be thrown widely open and then closed as the cage continues its movement up or down the shaft.

It is obvious that the arrangement of parts herein described may be reversed and that the stud or roll may be secured to the movable member or traveling cage of the elevator while the guides are attached to the other member or door of the elevator-shaft, and thereby accomplish the same results; but I prefer the arrangement shown and described. It is also apparent that the construction and arrangement of parts may be modified, and that the guides may be constructed of any suitable material instead of metal without departing from the spirit of my invention, and hence I do not desire to be limited to the exact construction shown and described. I am aware, however, that devices of the same general character above mentioned have heretofore been proposed for the purpose of automatically opening and closing the doors of elevators, and therefore I do not desire to claim, broadly, an inclined guideway attached to the cage or movable door, together with a roll or stud attached to one of said members for the purpose stated; but my invention, as above stated, is specially designed to prevent accidents by insuring the closing of doors that have been either accidentally or negligently left open or ajar by the elevator man or attendant, and is not intended to interfere with the usual duties of such attendant in respect to closing doors. To this end my improved guideways are constructed of spring metal or other suitable spring material, and are rigidly secured in position intermediate their ends and arranged in relation to the stud or roll which is secured to the movable door or cage of the elevator in such manner that the guides will remain normally inactive or out of contact with the roll when the doors of the elevator-shaft are properly closed; but on approaching a landing at which there is a door standing ajar or slightly open the outer ends of the guides will yieldingly engage the roll and automatically close the door.

What I claim, and desire to secure by Letters Patent, is—

1. In an elevator, the combination of the cage, the movable door, the stud or roll secured to one of said members, and the inclined curved spring-guides rigidly secured to the other member intermediate their ends only, so as to permit the free ends thereof to spring or yield when first engaged by the roll, said guides being arranged in relation to the roll so as to remain normally inactive when the doors of the elevator-shaft are closed, but adapted to yieldingly engage the roll and close an open or partly-opened door as the cage moves up or down the shaft, substantially as described.

2. In combination with the cage and movable door of an elevator, the automatic door-closing device comprising two separate oppositely-inclined centrally-secured curved spring plates or guides secured to one member and the stud or roll secured to the other member, said guides having their outer curved ends arranged in position to engage the roll while the cage is moving in either direction up or down the shaft, so as to automatically close the door in passing a landing, substantially as described.

3. In combination with the cage and movable door of an elevator, the oppositely-inclined separate spring plates or guides loose at their inner ends adapted to engage a stud or roll, so as to open the door as the cage approaches a landing and close the same when the cage moves in either direction from the landing, substantially as described.

4. In combination with the cage and movable door of an elevator, the oppositely-inclined spring plates or guides, the bracket having arms arranged at an acute angle to said guides, and the fixed stud or roll adapted to engage said guides and bracket, substantially as and for the purpose set forth.

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

JOHN LITTLE.

Witnesses:
GEORGE LITTLE,
CHAS. R. MERRICK.