(No Model.)

W. K. CROFFORD.

DOOR FOR HOISTWAYS.

No. 373,053. Patented Nov. 15, 1887.

Fig. 1.

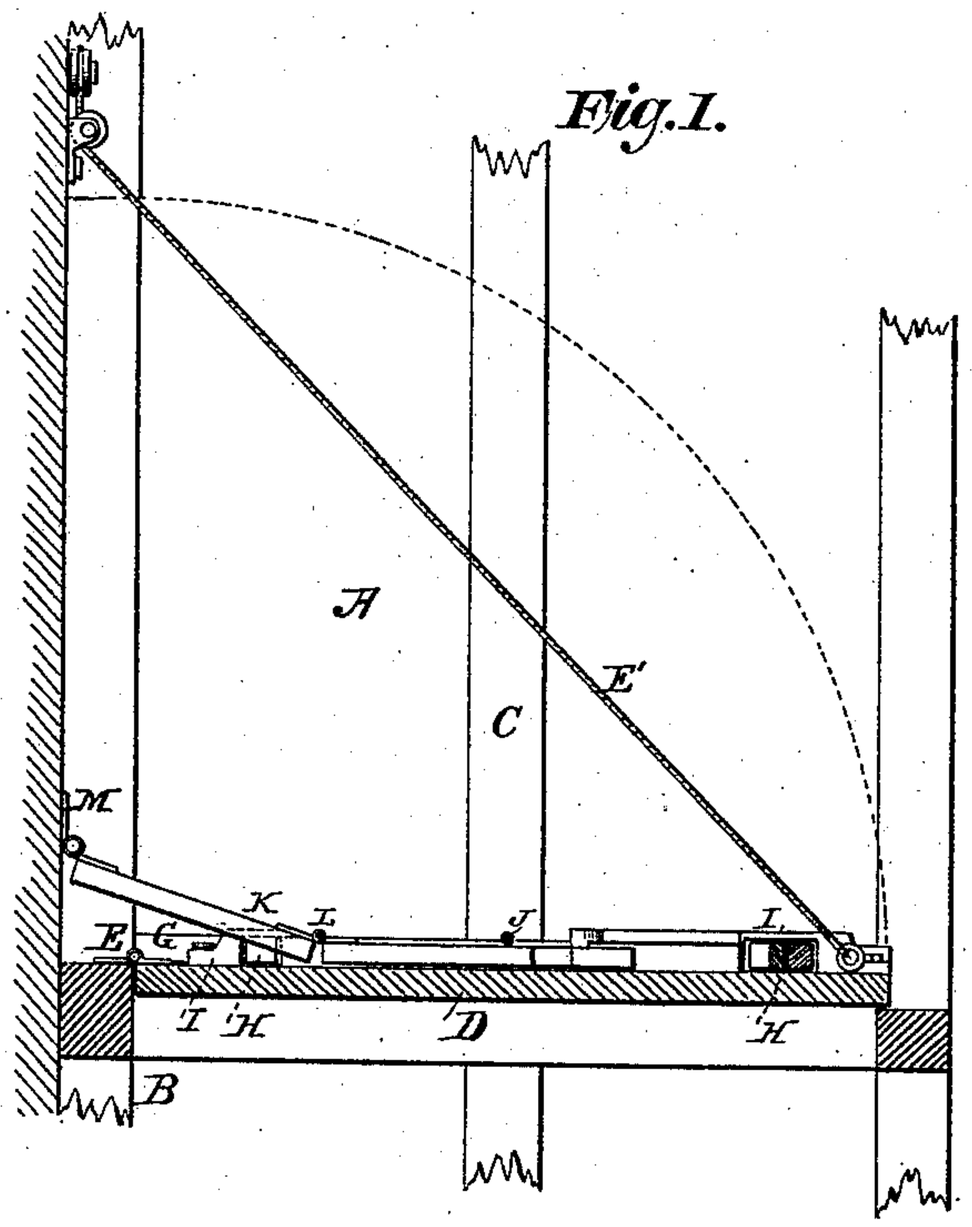
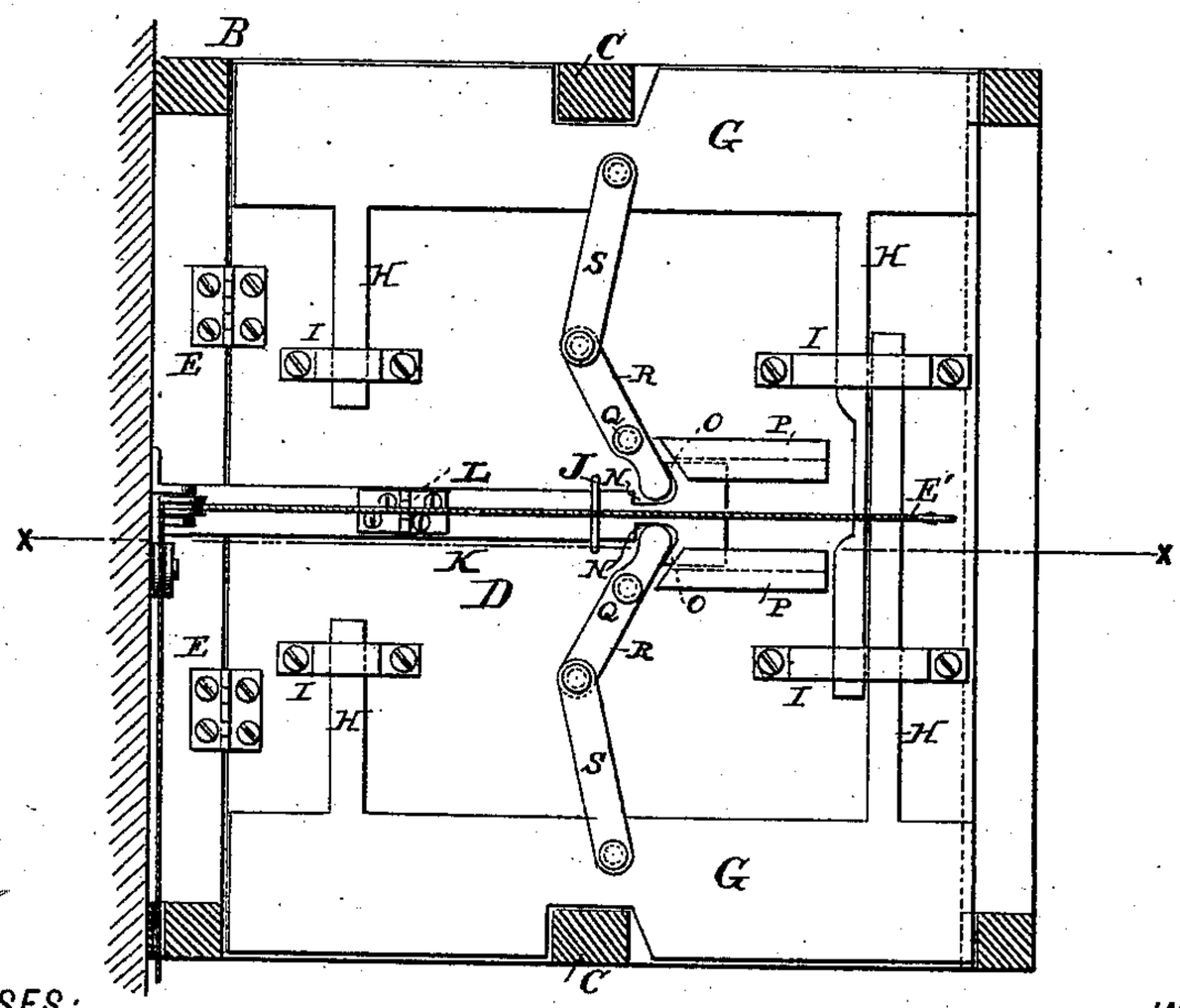


Fig. 2.



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UNITED STATES PATENT OFFICE.

WARREN K. CROFFORD, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM BARDSLEY, OF KEARNEY TOWNSHIP, NEW JERSEY.

DOOR FOR HOISTWAYS.

SPECIFICATION forming part of Letters Patent No. 373,053, dated November 15, 1887.

Application filed March 17, 1887. Serial No. 231,241. (No model.)

To all whom it may concern:

Be it known that I, WARREN K. CROFFORD, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Doors for Hoistways, of which the following is a specification.

The invention relates to improvements in doors for hoistways, and particularly to a novel construction and arrangement of operative parts, whereby slides arranged one at each side edge of the door may be given a simultaneous lateral movement outward beyond said edges during the closing of the door, and inward from over said edges during the opening of the door, the purpose of the slides being, when the door is closed, to cover the customary spaces between the side edges of the door and the adjacent surfaces forming the walls of the hoistway. It is essential that the slides have a quick movement inward during the first part of the opening of the door and a corresponding movement outward during the latter part of the closing of the door, the slides operating only during a portion of the movement of the door. To effect this movement of the slides in a manner which renders their use efficient in every particular is the object of the invention, and this is accomplished by means of an operative combination of elements, hereinafter described, especially constructed and arranged to insure the proper movement of the slides with certainty and safety. One door, with the slides and operative devices, will be arranged at each floor of the building. In the drawings, however, I illustrate but one door, this being sufficient to fully demonstrate the construction and operation of the invention.

In the accompanying drawings, Figure 1 is a vertical section on the line *x x* of Fig. 2, which is a top view of the door and attachments, the frame of the hoistway, together with the side bars for guiding the elevator therein, being illustrated in section.

A denotes the hoistway or elevator-shaft; B, the frame-work around the same; C, the side bars or guides for the elevator, and D the door, which is hinged at E, and is adapted to be opened or closed by means of a rope, E′, passing over suitable pulleys.

The rope E′ forms no part of the present invention, since it is the usual rope in use by means of which the door may be opened upward upon its hinges. By drawing downward upon the end of the rope E′ it will open the door D, and then, when the tension on the rope is relieved, the weight of the door D will cause the latter to close over the hoistway. The slides G are arranged upon the upper surface of the door, one being at each side thereof, and being of equal length with the door, in order that when moved outward, as shown in Fig. 2, they will close the spaces between the side edges of the same and the walls of the hoistway. The slides G are provided with the lateral arms H H, respectively, which pass through and are in part sustained by the guides I I, respectively, secured upon the upper surface of the door.

Upon the upper surface of the door is arranged, in a guide, J, the front portion of the bar K, which consists of two parts hinged together at L, the upper part being hinged to the wall at M, (see Fig. 1,) whereby, when the door D is either opened or closed, the front part of the bar K may have a longitudinal sliding movement upon the face of the door without danger of the same becoming broken or disarranged, the hinges operating during this movement to allow the front portion of the bar the sliding movement, while the guide J retains it in close relation to the door. The front end of the bar K is provided upon opposite sides with recesses N and lateral extensions O, which are within, and during the opening and closing of the door are directed by guides P.

Upon the face of the door, and at opposite sides of the front portion of the bar K, are secured, by pivots Q, the levers R, the short arms of which are engaged by the recesses N in the bar K, while their longer arms extend outward upon an angle from the bar K, and have pivoted to their ends the links S, which serve to connect said levers with the slides G G.

In the operation of the moving elements the front portion of the bar K slides forward during the opening of the door D, and during this movement presses against the shorter arms of the levers R, causing them to turn upon their pivots, bringing their longer arms toward the bar K, and operating through the links S to withdraw the slides G over the upper surface

of the door, thus permitting the full opening of the door without danger of the slides being broken by coming into contact with the side guide-bars, C. The slides G G will remain wholly upon the surface of the door while the latter is open; but during the latter part of the closing of the same the bar K will be brought to its former position, and during its movement the lateral extensions O will press against the shorter arms of the levers R, causing the said levers to turn upon their pivots Q to their former position, being that shown in Fig. 2, which has the effect of forcing the links S and slides G outward, the latter being moved over the edges of the door against the side walls of the hoistway, and closing the spaces, which, without the slides, would be left open and prove to be a serious objection.

I am aware that the slides G G alone are not new on hoistway-doors, and I am also aware that bell-crank levers and ropes have been arranged to move said slides; but, after careful study of the subject I am convinced that neither the bell-crank lever nor the ropes have been entirely satisfactory, and that no movement so effectually adapted for hoistway-doors as I secure could possibly be obtained by any means heretofore constructed for the purpose.

The toggle-levers and links forming a part of my invention differ in their construction, arrangement, and effect, and the promptness and certainty of their action at the proper time from any device known to me for operating the slides, and effectually accomplish the purposes of their production.

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

1. In combination with a hoistway-door, the slides G G at opposite edges of the door, the bar K, formed of two parts hinged together and adapted to have a sliding movement during the operation of opening and closing the door, the levers R, pivoted upon the door and having their inner ends in engagement with the front part of the said sliding bar K, and the links S, which are placed at an angle to the longitudinal center of the door and are pivotally secured at one end to the longer arms of said levers and at their other ends upon the slides G, the slides and levers being free to open and close toward each other during the opening and closing of the door, substantially as and for the purposes set forth.

2. In combination with a hoistway-door provided with the slides G G at opposite edges thereof, the bar K, adapted to slide upon the door in a guide and provided with the recesses N, the levers R, pivoted upon the face of the door and having their shorter arms engaged by said recesses and their longer arms connected with the slides G G by means of the pivoted links S S, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 16th day of March, A. D. 1887.

WARREN K. CROFFORD.

Witnesses:
WILLIAM BARDSLEY,
CHAS. C. GILL.