

(No Model.)

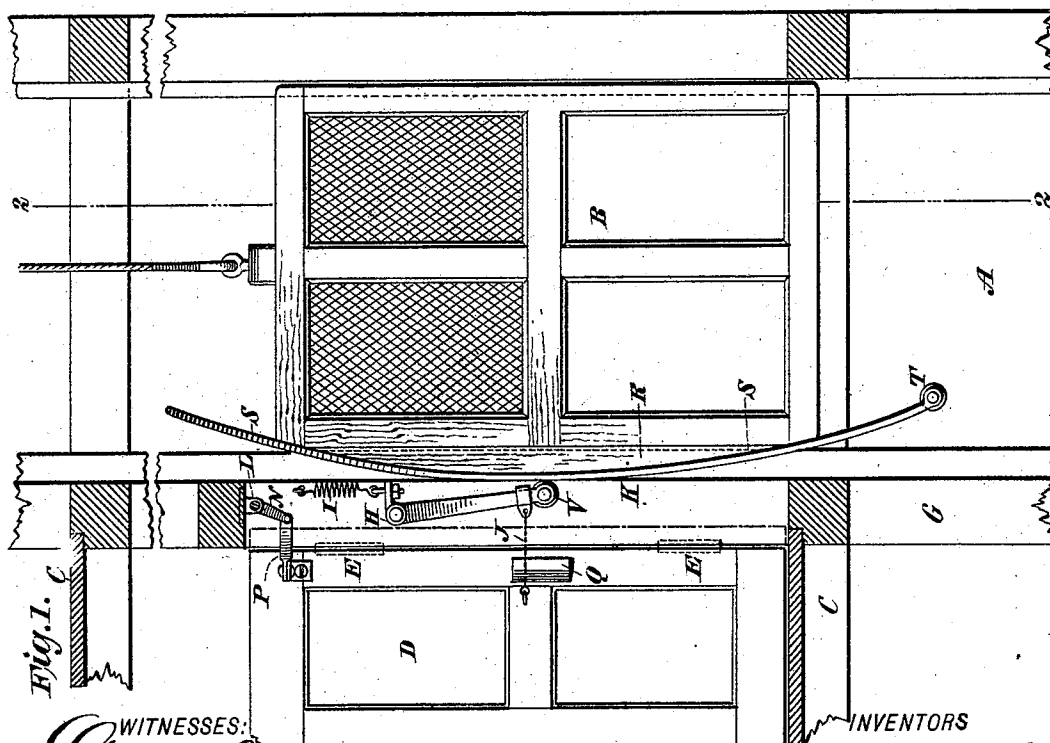
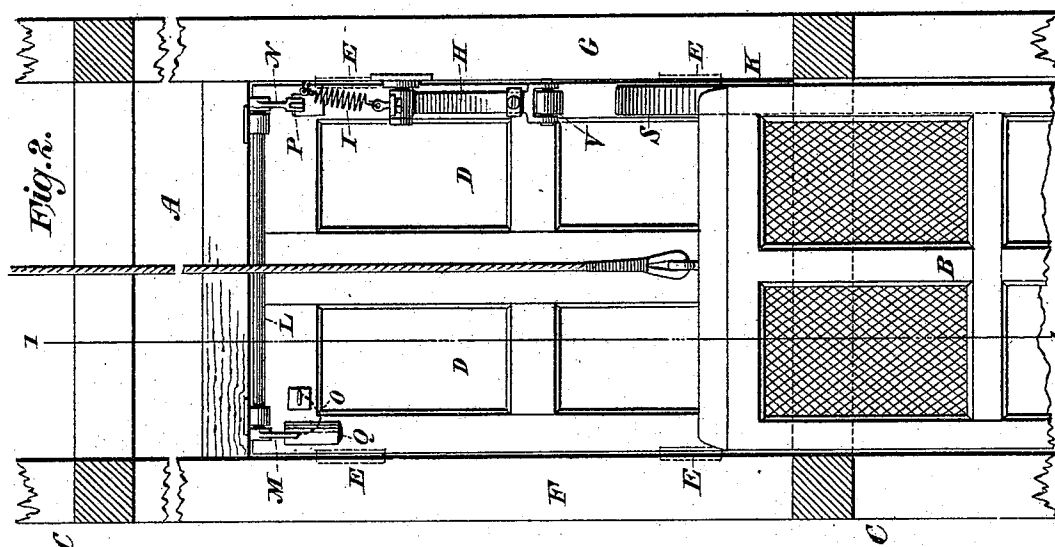
2 Sheets—Sheet 1.

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DOOR MECHANISM FOR ELEVATOR SHAFTS.

No. 516,695.

Patented Mar. 20, 1894.



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Fig. 3.

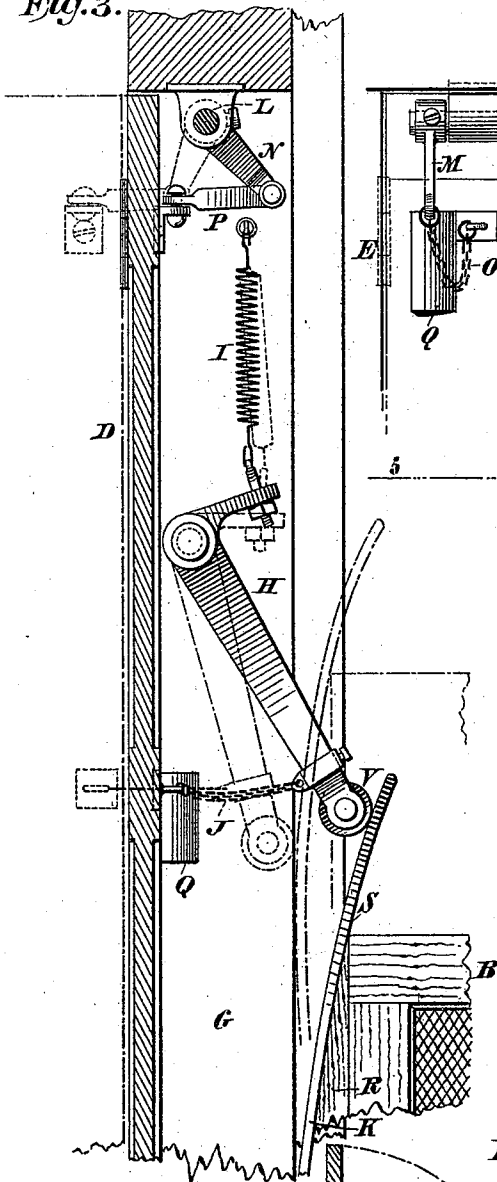


Fig. 4.

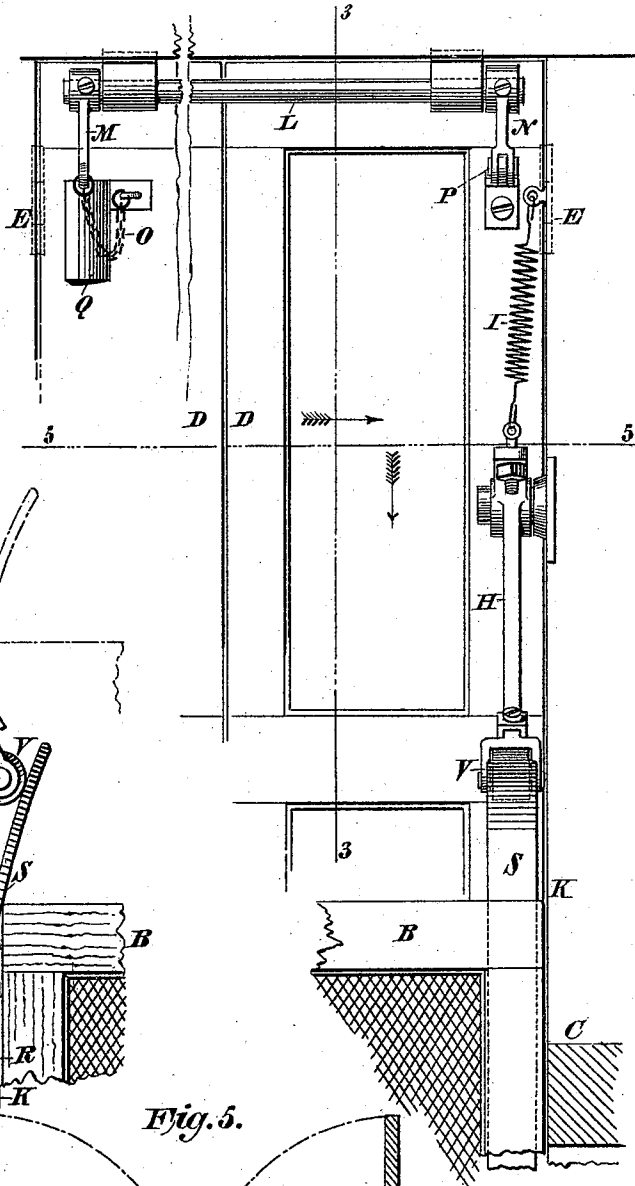
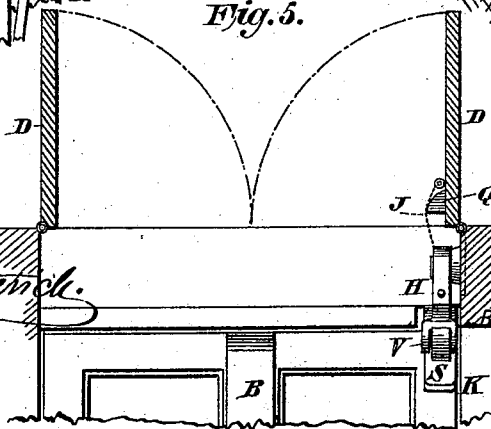


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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

DOOR MECHANISM FOR ELEVATOR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 516,695, dated March 20, 1894.

Application filed June 28, 1893. Serial No. 479,077. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BARDSLEY, a resident of Kearney township, State of New Jersey, and WARREN K. CROFFORD, a resident of New York, in the county of New York and State of New York, 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, which will automatically close the elevator shaft doors and maintain them in their closed position until during the use of the carriage or hoist a cam or projection on the latter relieves the mechanism acting on the doors and thus leaves the doors free to be pushed open by hand.

The invention pertains particularly to the doors of fire proof elevator shafts, which doors are hinged at their vertical edges and extend 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 that the shaft doors be closed at all times except when during the operation of the carriage or hoist it becomes necessary for the latter to stop at any special floor to take on or discharge freight or passengers.

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

Figure 1 is a vertical section through an elevator shaft having doors employing mechanism constructed in accordance with and embodying the invention, the doors being shown open opposite to the carriage, and the section being on the dotted line 1—1 of Fig. 2. Fig. 2 is a vertical section of same on the dotted line 2—2 of Fig. 1, the carriage being illustrated as having descended and the doors as closed. Fig. 3 is an enlarged detached vertical section through a part of the shaft on the dotted line 3—3 of Fig. 4, and showing by full and dotted lines the two positions of the mechanism connected with the doors. Fig. 4 is a detached section, partly broken away, corresponding with the section of Fig. 2, but

showing the mechanism on an enlarged scale; and Fig. 5 is a horizontal section through the elevator shaft on the dotted line 5—5 of Fig. 4.

In the drawings A designates the elevator shaft; B the carriage or hoist; C the various floors of the building, and D the shaft doors, which are secured at their vertical edges by means of hinges E, and close the doorway or space between the beams F, G.

Upon the face of the beam G at each floor of the building, is pivotally mounted the bell-crank lever H, whose upper arm is connected with a coiled spring I, and whose lower arm is by means of a chain J connected with the door D. The spring I exerts an upward strain throwing the lower arm of the bell-crank lever H inward toward the shaft and causing the same, through the medium of the flexible connection J, to close the door. The force of the spring I, will operate to retain the door closed at all times except when its action on the bell-crank lever H is overcome by the cam K, on the elevator carriage or hoist, at which time the said cam having pushed the lower arm of said lever outward and the carriage having come to a stop, the attendant may freely push the door open, the slack in the flexible connection J at such time being sufficient to admit of the door swinging wide open.

The doors D are preferably, for convenience, arranged in pairs, as shown, and it being desirable that the doors may close simultaneously under the action of the spring I, we journal above the doors the rock-shaft L, having at its ends the arms M, N, the former being, by means of a chain O, connected with one of the doors, and the arm N, being, by means of the pivoted link P, connected with the other of said doors. When the cam K presses the lower arm of the bell-crank lever H, outward, as shown in Fig. 1, and the attendant pushes the doors open, the chain J and chain O will be drawn practically taut, and then when the elevator carriage moves onward carrying the cam K, from the lever H, the spring I, will draw the lower arm of said lever, and the chain J, inward, closing the door connected with said chain, the movement of this door being communicated through the link P, arm N, rock-shaft L, arm M, and chain O, to the other door, whereby the two

doors may have a simultaneous closing movement. When a single door D is used instead of doors in pairs, the rock-shaft L, and its connecting arms will be omitted. Upon the doors D, are the blocks Q, having a curved surface against which the chains or other flexible connections, J, O, are drawn when the doors are opened, as shown in Fig. 5, and the purpose of these blocks is to enable the chains to have a more direct and positive pull against the face of the doors and hence to close them positively and with certainty.

The cam K may be of any convenient construction, and in the drawings we have shown it as being formed of the curved projection R, and curving metal strip S, the latter having at its lower end the roller T, against which the roller V, in the end of the lever H, will move during the passage of the carriage through the shaft. The metal strip S projects above and below the carriage, and is of sufficient length and curvature to admit of an easy, gradual movement of the lever H, and of the employment of a convenient length of chain J, thus relieving the mechanism of all strain and avoiding any violent closing of the doors.

From the foregoing description it will be noticed that the doors are automatically closed by the action of the spring I, and that the elevator carriage or hoist automatically relieves the force of the spring from the doors, leaving the latter free to be pushed open.

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

1. The elevator shaft door hinged at its vertical edge and adapted to open outward from the shaft, combined with the carriage having a cam, the pivoted lever connected at one end by a flexible connection with the door, and the spring acting on said lever to hold the door normally closed; substantially as and for the purposes set forth.

2. The pair of elevator shaft doors hinged at their vertical edges and adapted to open outward from the shaft, combined with the carriage having a cam, the pivoted lever connected at one end by a flexible connection with one of said doors, the spring acting on said lever to hold the door normally closed, and mechanism connecting the doors and transmitting the closing movement of one of said doors to the other thereof; substantially as and for the purposes set forth.

3. The elevator shaft door, and the spring and flexible connection holding the door normally closed, combined with the carriage and means for automatically relieving the action of the spring from the door; substantially as set forth.

4. The elevator shaft, the pair of doors therefor, and the rock shaft having at one end an arm connected by a chain with one door and at its other end an arm connected by a link with the other door, combined with the spring and flexible connection holding the doors normally closed; substantially as set forth.

5. The elevator shaft door having the block Q, on its inner face, and the spring and flexible connection holding said door normally closed, combined with the carriage and means for automatically relieving the action of the spring from the door, the said block being adjacent to the inner end of said flexible connection and receiving said connection across its face when the door is opened; substantially as 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.

WILLIAM BARDSLEY.
WARREN K. CROFFORD.

Witnesses:

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