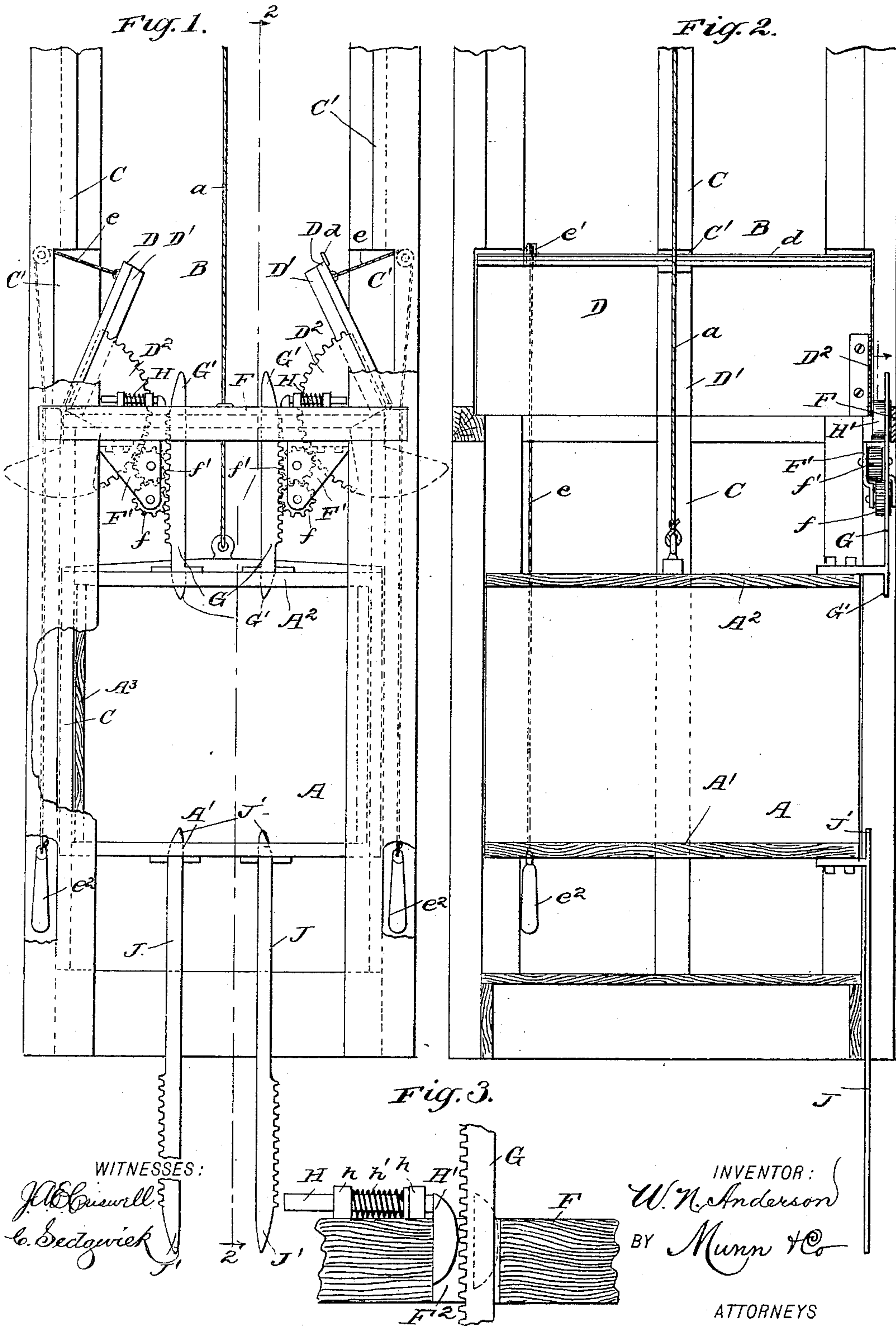


(No Model.)

W. N. ANDERSON.
MEANS FOR OPERATING ELEVATOR DOORS.

No. 450,905.

Patented Apr. 21, 1891.



UNITED STATES PATENT OFFICE.

WILLIAM N. ANDERSON, OF SAN RAFAEL, CALIFORNIA.

MEANS FOR OPERATING ELEVATOR-DOORS.

SPECIFICATION forming part of Letters Patent No. 450,905, dated April 21, 1891.

Application filed August 1, 1890. Serial No. 360,648. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. ANDERSON, of San Rafael, in the county of Marin and State of California, have invented new and useful Improvements in Elevator-Doors and Means for Operating the Same, of which the following is a full, clear, and exact description.

My invention relates to improvements in elevator-well doors and in means for automatically operating the same; and the object of my invention is to provide means for automatically closing the elevator-well in such a manner that there will be no draft through the well and to provide means for automatically opening the doors of the well.

To this end my invention consists in vertically-swinging doors adapted to close the elevator-well and in means for automatically opening and closing said doors by the movements of the elevator-car. This construction will be hereinafter fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a broken side elevation of the apparatus embodying my invention, portions being broken away to show the weights for balancing the doors and the slot in the sides of the elevator-frame. Fig. 2 is a vertical cross-section on the line 2 2 of Fig. 1, and Fig. 3 is a broken detail sectional view of the slotted floor-joist with a rack in the slot and with means for closing the slot after the rack has passed through.

The elevator-car A moves vertically in the well B, said car being raised by a cable *a*, attached to the top of the car-frame and connecting with a suitable winding-drum in the ordinary manner.

The elevator-car is provided with a floor A' and a top A² of the usual construction, said floor and top carrying mechanism for operating the doors, as hereinafter described. The opposite sides A³ of the car-frame are slotted vertically to receive the side posts C of the elevator-well, as shown at the left-hand side of Fig. 1, which posts thus serve as guides for the car. The posts C are provided with recesses C' just above each floor of the build-

ing, said recesses being adapted to receive the doors D, which are hinged opposite each floor and on opposite sides of the elevator-well, so that when closed they will close the elevator-well and will be on the same plane as the adjacent floors.

The doors D are provided on their under sides with strips D', extending transversely across the doors, said strips being of the same width of the posts C, so that when the doors are opened the strips will align with the posts and thus form a continuous guide for the elevator-car. One of the doors D is provided at its inner edge with a projecting flange *d*, which overlaps the abutting door when the doors are closed together. A cord *e* is fixed to each door D near its inner edge, said cords extending over suitable pulleys *e'* and having at their lower ends weights *e''*, which serve as counter-balances for the doors and enable them to be easily operated. Each door is also provided at one end with a segmental rack D², which racks depend from the doors and mesh with the pinions *f''*, as described below.

A floor-joist F extends across each entrance to the elevator-well, and said joist is provided with depending hangers F', carrying the pinions *f* and *f''*. The pinions *f* align with and engage the toothed racks G, which are fixed to the top of the elevator-car frame, and the pinions *f''* mesh with the segmental rack D². The pinions *f* and *f''* also mesh with each other. The floor-joist F is provided with vertical slots F² on the inner side, which align with the racks G on the top of the elevator-frame and the racks J, which are attached to the bottom of the elevator-frame. A plate H is mounted in keepers *h* on the floor-joist F adjacent to each of the slots F², said plate being held normally forward by the spiral spring *h'*, which encircles it, and the end of the plate next the slot is provided with an oval head H', which projects into the slot F² of the floor-joist, and the spring *h'* holds the plate H and head H' in position to normally close the slot F², thus preventing any draft through the slot of the floor-joist. The toothed racks G, which are fixed to the top of the car A, have pointed ends G', that they may readily enter the slot F² of the floor-joist and force the head H' of the plate H to one side of the slot. The toothed racks J are attached to the floor of

the car A inside of the line of the racks G and engage with the pinions f' , which are wider than the pinions f , the said racks J having pointed ends J' to engage the head H' of the plate H and move it to one side.

The device operates as follows: When the car A ascends, as it approaches a floor of the building the pointed ends G' of the racks G will pass through the slot F^2 of the floor-joist F, and the teeth of the racks will engage the pinions f , thus turning the pinions, which, as they turn, will turn the pinions f' and the segmental racks D^2 thus raising the doors D. As the car continues to ascend, the racks J engage the pinions f' , thus turning the segmental racks D^2 and closing the doors D. When the elevator-car is descending, the racks J will first engage the pinions f' , thereby opening the doors, and as the elevator-car passes downward the racks G will engage the pinions f and close the doors. It will be observed that when the doors are closed the flange d of the doors will prevent any draft from passing between the same, and the spring-plate H will close the slot F^2 of the floor-joist, so that there can be no draft through the elevator-well. This is a great advantage, as it prevents the rapid spread of flames usually occasioned by the draft through the elevator-well.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of two vertically-swinging doors adapted to close the elevator-well, one of said doors having a flange adapted to overlap the abutting door, counter-balances

attached to each of the doors, segmental racks fixed to the under side of each door near the end, a slotted floor-joist at the entrance to the elevator-well, a spring-pressed plate having an oval head adapted to close the slots in the floor-joist, depending hangers fixed to the floor-joist and having pinions pivoted therein, one set of said pinions meshing with the segmental racks and the pinions meshing with each other, and pointed toothed racks fixed to the upper and lower portions of the elevator-car, so as to engage the pinions, substantially as described.

2. The combination of side posts on opposite sides of the elevator-well, having recesses near each floor of the building, vertically-swinging doors hinged to the side posts and adapted to open into the recesses of the same, said doors having suitable counter-balances and one of the doors having a flange adapted to overlap the abutting door, segmental racks fixed to the under side of each door near the end, a slotted floor-joist fixed in each entrance to the elevator-well, a spring-pressed plate having an oval head adapted to close the slots of the floor-joist, depending hangers fixed to the floor-joist and having pinions pivoted thereto, one set of pinions meshing with the segmental racks, and the pinions meshing with each other, and pointed toothed racks fixed to the upper and lower portions of the elevator-car, so as to engage the pinions alternately, all substantially as described.

WM. N. ANDERSON.

Witnesses:

H. S. SWASEY,
HARRISON JONES.