(No Model.)

E. A. JACOBS.

HATCHWAY DOOR OPERATING MECHANISM.

No. 262,783. Patented Aug. 15, 1882.

Fig. 1.

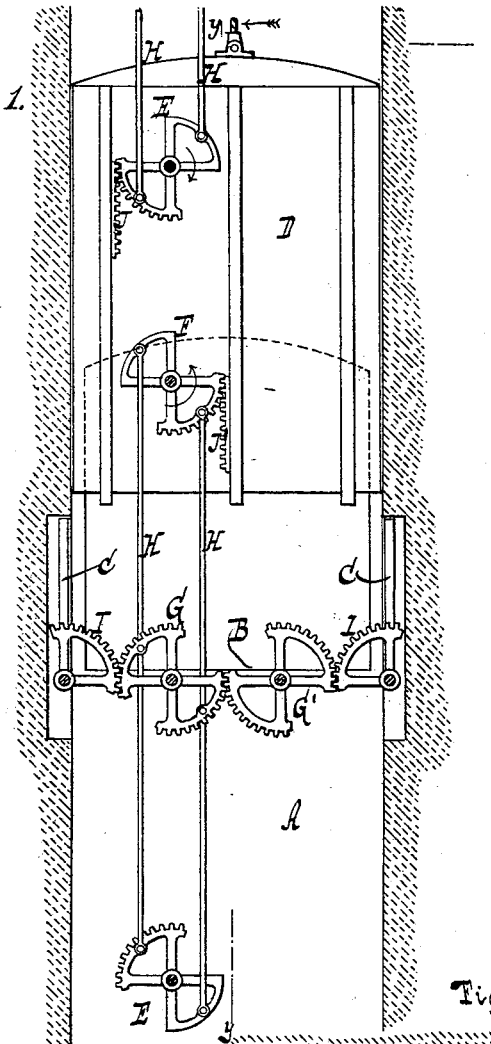


Fig. 2.

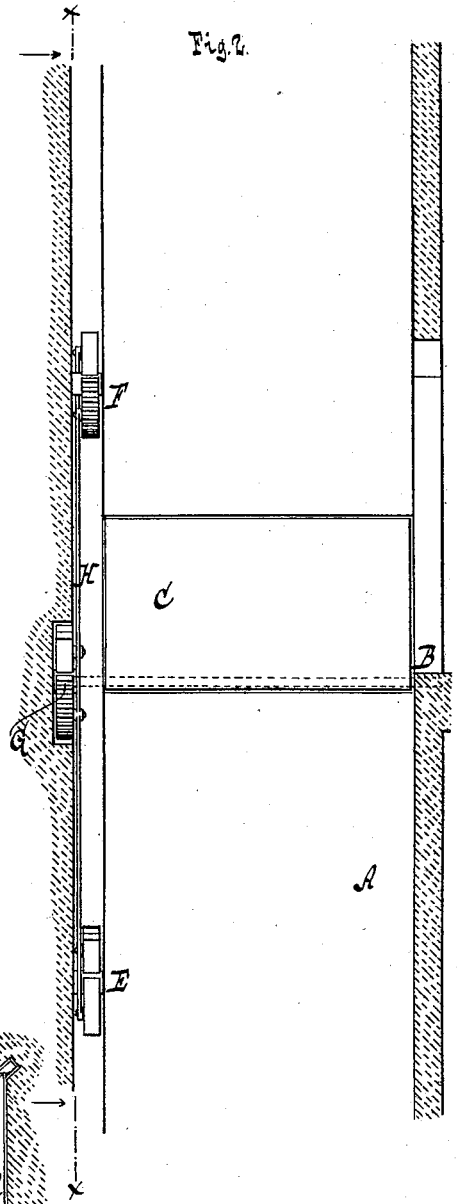
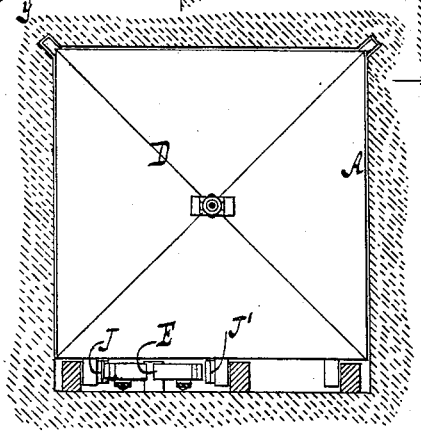


Fig. 3.



WITNESSES:

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ERNST AUGUST JACOBS, OF CHICAGO, ILLINOIS.

HATCHWAY-DOOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 262,783, dated August 15, 1882.

Application filed May 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, ERNST AUGUST JACOBS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Hatchway-Door-Operating Mechanism, of which the following is a specification.

This invention relates to mechanism for opening and closing hatchway-doors automatically in the ascent or descent of the elevator car or platform working in the hatchway; and it consists in an opening-lever and a closing-lever arranged respectively below and above the hatch-hole of each floor, two operating-levers arranged on one edge of the hatch-hole in engagement with each other, one or two vertical rods connecting both the opening-lever and the closing-lever to one of the operating-levers, hinged doors carrying levers which engage the operating-levers, and an elevator-car having one of its sides provided with devices to engage the opening and closing levers on opposite sides of their fulcra, as hereinafter more fully set forth, so that when the elevator-car ascends or descends, and before it reaches the hatch-hole, the doors are opened, while when the car has passed through the hatch-hole the doors are closed.

This invention is illustrated in the accompanying drawings, in which Figure 1 shows the operating mechanism in side view, partly in section, the plane of section being indicated by the line *x x*, Fig. 2. Fig. 2 is a vertical central section through Fig. 1, as indicated by the line *y y*. Fig. 3 is a horizontal section.

Similar letters indicate corresponding parts.

The letter A designates the hatchway of a building; B, one of the floors, having the usual hatch-hole provided with two hinged doors, C.

D indicates the elevator-car.

E is the opening-lever and F the closing-lever, arranged one below and the other above the hatch-hole, they being pivoted to the building on one side of the hatchway, as shown in Fig. 2.

G G′ are the operating-levers, arranged on one edge of the hatch-hole; H, the vertical rods whereby the opening and closing levers are connected to one of the operating-levers; I, the door-levers engaging the operating-levers, and J J′ the devices of the car serving to engage the opening and closing levers.

The operating-levers G G′ are made in form of double-toothed segments, and they engage each other by one set of their teeth, the other set being a medium for the engagement therewith of the door-levers I, which latter are made in the form of single-toothed segments. These door-levers are connected to the doors at one end thereof, and in such a manner that the fulcra of the levers are in the horizontal plane of the pivots forming the door-hinges.

The rods H are pivoted to the opening and closing levers E F at their opposite ends, while they are pivoted to the operating-lever G at intermediate points. One such connecting-rod will answer the required purpose; but I prefer to use two rods in order to distribute the strain on the levers to which the rods are connected, and when two rods are used they are arranged on opposite sides of the fulcra of the levers, as shown. The opening and closing levers E F are both made in form of a toothed segment at one end, the segment of one lever, however, being on an opposite side of its fulcrum to that of the other, and the lever-engaging devices J J′ consist of racks which are secured to one side of the car in suitable positions to catch into the segments in the movements of the car, the rack J being above the rack J′.

In the ascent of the elevator-car the rack J engages the opening-lever E before the car reaches the hatch-hole, and swings such lever in the direction of the arrow shown in the upper part of Fig. 1, when this lever acts on the operating-lever G through the rods H, and thence on the operating-lever G′ and the door-levers to raise or open the doors, while when the car has passed through and risen above the hatch-hole a sufficient distance the rack J′ acts upon the closing-lever F to turn the same in the direction indicated, when this lever acts on the operating-levers and door-levers in a reverse direction to the opening-lever, thus closing the doors. In like manner the doors are opened and closed in the descent of the car—that is to say, the doors are opened before the car reaches the hatch-hole and closed after it has passed through it, the lever F becoming the opening-lever and E the closing-lever.

It will be noticed that the mechanism above described is highly effective in its operation

and extremely simple in its construction, thus being comparatively inexpensive.

It is preferred to use the teeth for the engagement of the several parts with each other; but a good result can be obtained also by frictional contact of the parts; or the reversing devices J J′ can be made in form of tappets to displace the opening and closing levers in the passage of the car.

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

The combination, substantially as hereinbefore set forth, of the opening-lever and closing-lever arranged respectively below and above the hatch-hole, the operating-levers arranged on one edge of the hatch-hole in engagement with each other, the vertical rods connecting both the opening-lever and the closing-lever to one of the operating-levers, the hinged doors, the door-levers engaging the operating-lever, and the elevator-car having one of its sides provided with devices for engaging the opening and closing levers on opposite sides of their fulcra, in the manner specified.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

ERNST AUG. JACOBS. [L. S.]

Witnesses:

J. HERMANN WAHLERS,

E. F. KASTENHUBER.