

(No Model.)

2 Sheets—Sheet 1.

J. B. CRAIG & T. W. PURCELL.

DEVICE FOR OPERATING DOORS TO ELEVATOR WELLS.

No. 461,411.

Patented Oct. 13, 1891.

Fig. I.

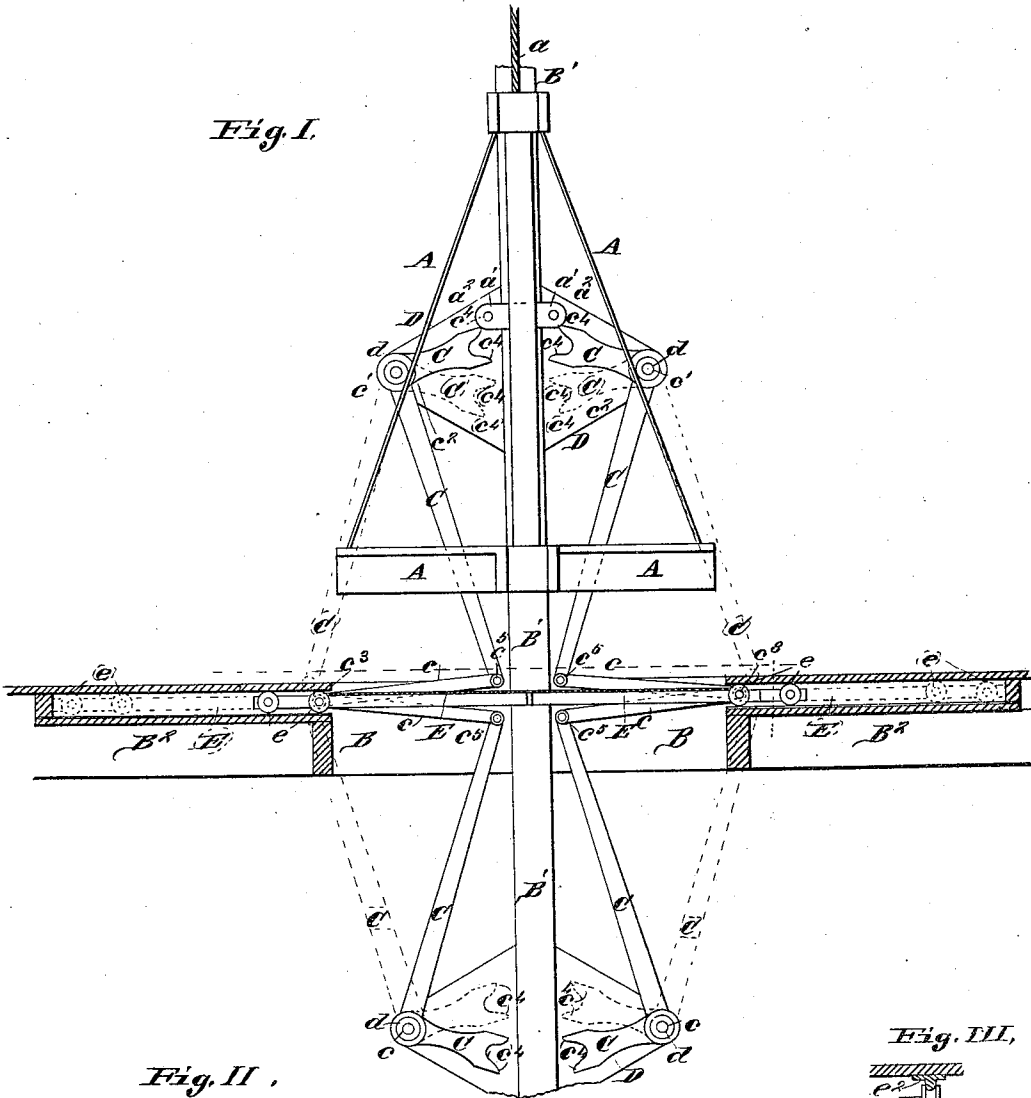


Fig. II,

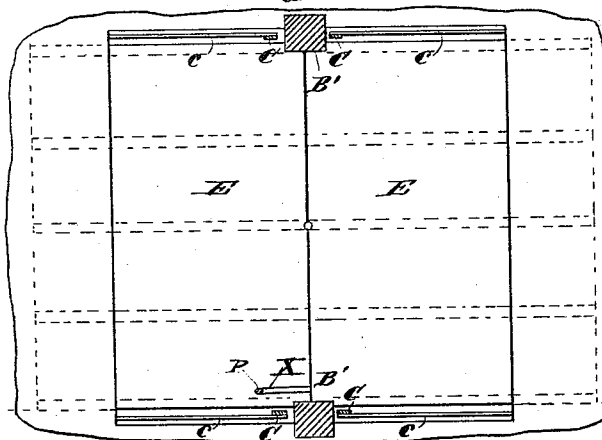
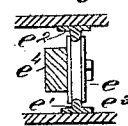


Fig. III,



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Fig. IV.

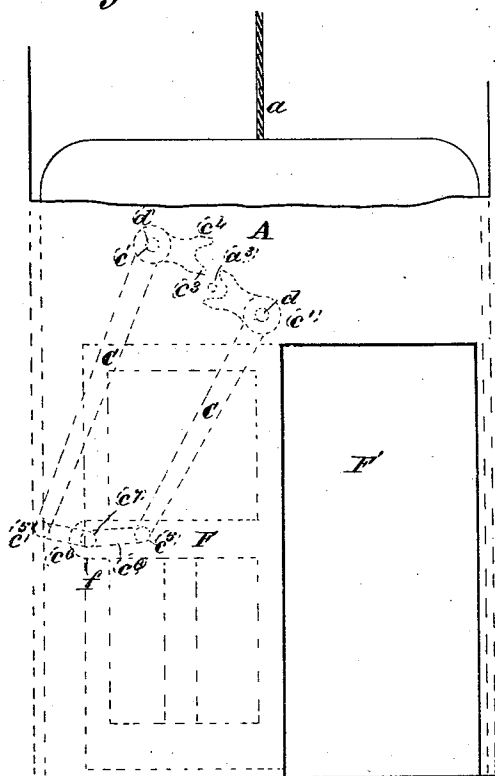


Fig. V.

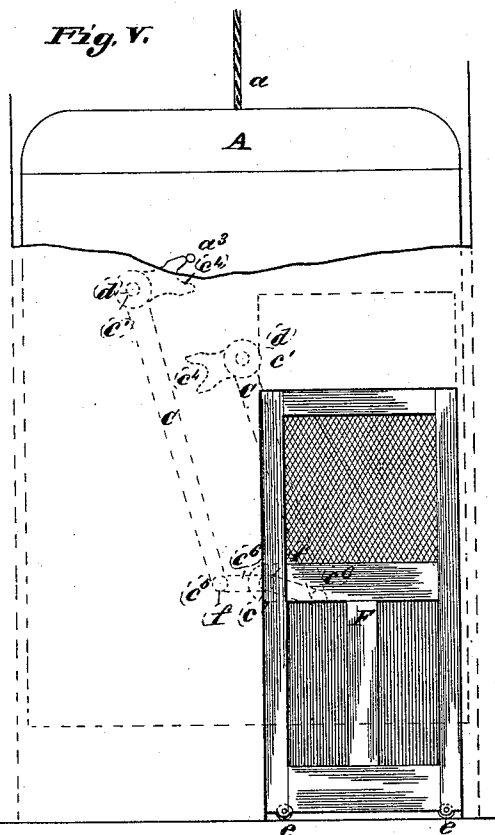
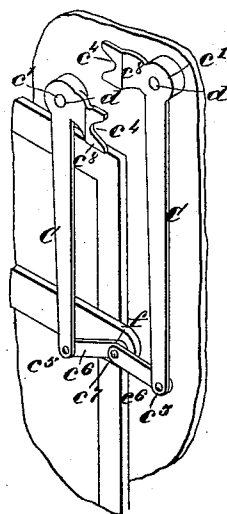


Fig. VI.



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UNITED STATES PATENT OFFICE.

JOHN B. CRAIG AND THOMAS W. PURCELL, OF ST. LOUIS, MISSOURI.

DEVICE FOR OPERATING DOORS TO ELEVATOR-WELLS.

SPECIFICATION forming part of Letters Patent No. 461,411, dated October 13, 1891.

Application filed May 20, 1891. Serial No. 393,431. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. CRAIG and THOMAS W. PURCELL, both citizens of the United States, and residing at the city of St. Louis, in the State of Missouri, have jointly invented a new and useful Improvement in Devices for Automatically Opening and Closing the Hatchways and Doors of Elevators, of which the following is a specification.

Our invention relates to devices for automatically opening and closing the exit and entrance doors or gates of elevators used for carrying passengers or freight, and at the same time open or close the hatchways or trap-doors of an elevator-shaft provided on the floor-lines of a building containing an elevator, wherein such doors and hatchways are actuated by sliding them in opening or closing; and the object of our invention is to afford means wherein, by the upward and downward movements of the elevator in its well or shaft, the sliding doors leading to it from the floors, as well as the sliding hatch-covers provided for safety against accident or fire, may be alternately opened and closed, so that the elevator-shaft may be at all times guarded either by closed doors and hatchways or the presence of the elevator-car, ready to receive or discharge passengers or freight at the floor desired. We attain these objects by the devices and mechanism shown by the accompanying drawings, in which—

Figure I is a view, partly in section and partly in elevation, of a portion of an elevator-shaft containing an elevator and showing our device applied for the purpose of opening and closing the hatch-covers or trap-doors of a hatchway in the floor of a building. Fig. II is a top view showing the hatchway-cover closed. Fig. III is a sectional view showing a roller on which the hatchway-cover moves, with its truck and support. Fig. IV is an elevation of an elevator-car, showing by dotted lines our opening and closing device applied, with the door open. Fig. V is a similar view showing the same closed. Fig. VI is a perspective view of our device applied to the floor-guards of an elevator, showing portions of the latter broken off.

Similar letters are used to designate similar parts throughout the drawings.

In the drawings, A represents the elevator;

B, the elevator shaft or well; B', an upright extending on one side the length of the well, and B² the floor and ceiling, with the space 55 between, of a story to a building within which the hatch-covers operate, and these together constitute the frame-work for our invention.

D represents a block attached to the upright B'.

C C represents angle-bent lever-bars, made of wrought iron or steel, having a V-shaped or forked end to each, as shown by C⁴ C⁴, with an eye C⁵ in the other end thereof, to which is pivoted the link C. For our device for 65 operating the sliding hatch-cover E four of the within angle-bent lever-bars are used, two being placed above the floor and inverted, two below the ceiling of the floor below, the downwardly-descending arms above the floor 70 and the upwardly-extending arms below the ceiling being approximately of the length of the opening of the hatchway designed to be covered.

The hatch-covers are represented by E. 75 They are made square, in two parts, of light material in wood or iron, and are twice the length of the opening they are designed to cover when the hatch is closed. These hatch-covers are placed on two or more axles, (represented by e⁴, Fig. III,) which move on wheels e, having grooves e³ between the upper and lower guides or tracks e' e², and are placed on two sides of the hatch-opening between the floor and ceiling, as shown in Fig. I. The 85 angle-bent arms are fastened to the bracket D at the points d d by the pivot-pin c', on which they move. The short angle-arms of the levers which terminate in the V-shaped or forked cam-ears are placed opposite one another, approximating the middle of the elevator-well, as shown, the sliding cover or platform of the hatch being connected pivotally with the operating-lever arms C C by pin connection C³ C³. 95

The hatch-covers have a slit or opening X on one side to accommodate the movement of the rope P.

a' is a short steel bar provided with projecting pins a² a². It is fastened approximately midway of and to the elevator-car, and may or may not carry a friction-roller. 100

In the door opening and closing appliance of our invention, as shown in Figs. IV, V,

and VI, we use two of the forked end and angle-bent lever-bars, which are pivotally connected with each other and with the door in the guard-cage at the floor-landing, (see figures last referred to,) the forked end of one being raised slightly higher than that of the other, so as to allow of their passing one another, as shown at c^8 .

Having provided a suitable bracket or support on which to hang the lever-operating bars for the door, we connect it pivotally to the door at the point f by the pivot-pin c' , making a center for the backward-and-forward motion of the door F on the lever-bearing pivot connection c' on the guard above the door, as shown fully in Fig. VI, with the mouth or forked ends of the levers facing toward each other, the one above the other, with a slight angle—sufficient to freely allow a^3 to pass. The latter is a pin projection fastened to the side of the elevator-car next the door approximating the point a^3 , Fig. IV, which point should be on a line permitting the pin projection to pass one cam-ear of the lever represented by c^4 and impinge upon the other, thus actuating the lever-arms to open or close the door as the elevator ascends or descends, as the case may be.

It will be readily understood from the drawings how our device operates, viz: as the elevator-car descends on the rope a down the elevator-shaft the projections a^2 a^3 , Fig. I, enter the V-shaped ends of the angle-bent lever-bars C C , and, passing by the first lug or ear thereof, strike the second, and thus actuate the lever connection with the hatch-

way-covers E E , throwing them back and opening the hatchway at or about the same time the projecting pin a^3 on the opposite side of the elevator-car intercepts the lower ear of the upper lever-bar, (see a^3 , Fig. V,) and the door is thrown open by the levers, as shown by Fig. IV, just when the elevator-platform is on a level with the floor. The car thence descending, the pin or roller projections a^2 a^3 , Fig. I, impinge on the lower ear of the upwardly-projecting bent levers C C below the ceiling, (see Fig. I,) which in turn actuate the lever-connection with the hatch-covers and closes them. About the same time the pin projection a^3 on the opposite side of the elevator-car impinges on the lower ear of the under lever-arm and operates it to close the door.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The combination of the slidable door, the L-shaped levers pivoted at their angles to the elevator-shaft and having their shorter arms arranged in substantially horizontal planes, with their ends forked and in the same vertical plane, the elevator-car having a single lateral projection adapted to successively engage the forked ends of the levers, and links connecting the ends of the longer arms of the levers to the door.

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Witnesses:

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