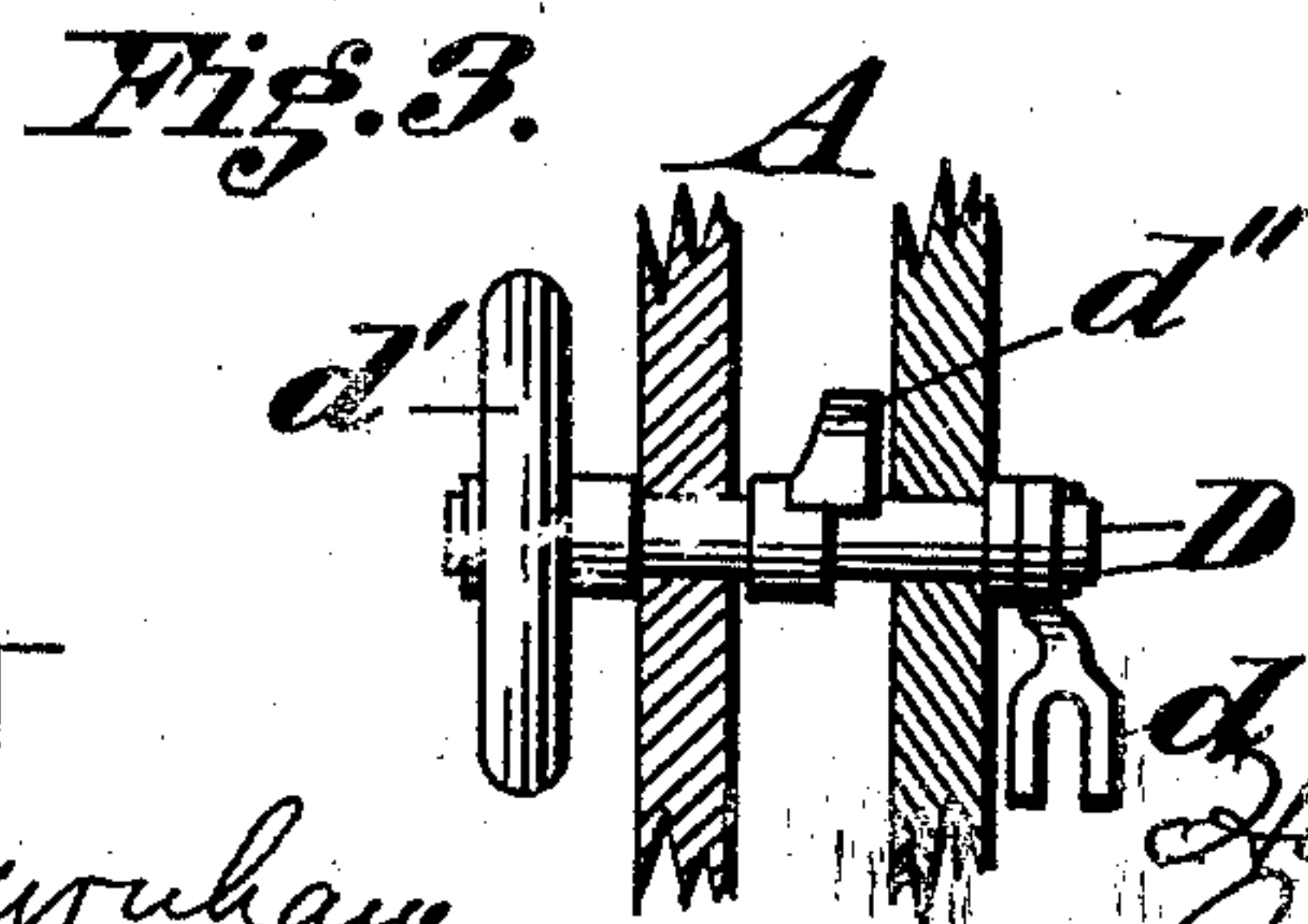
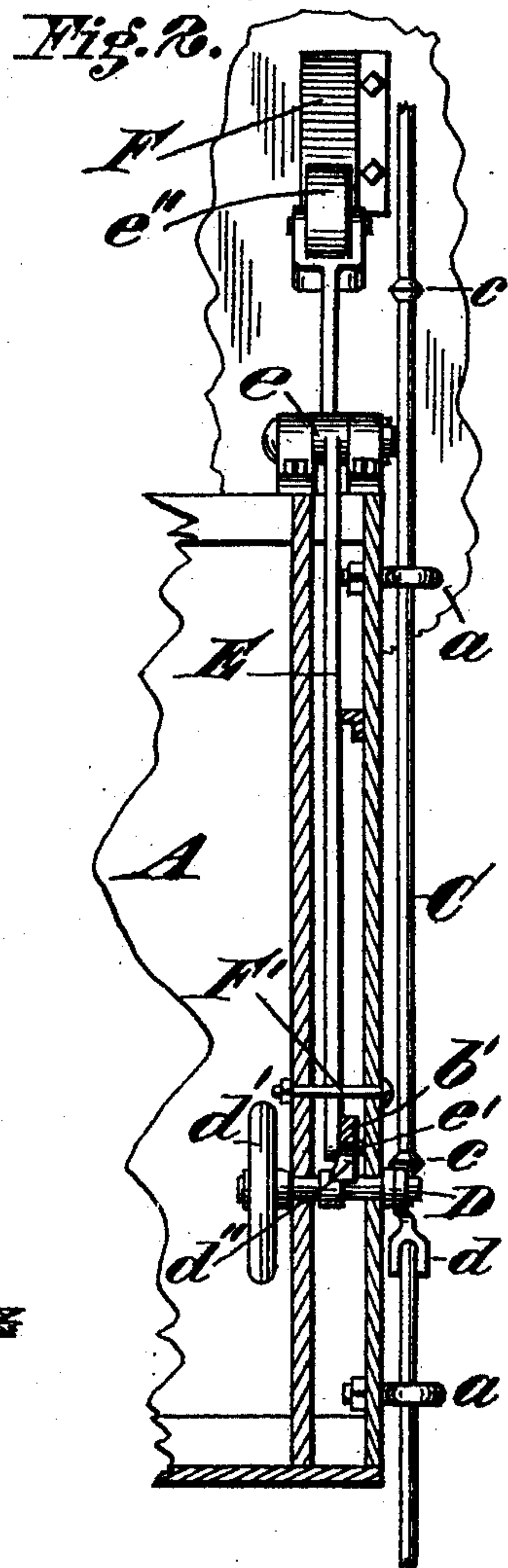
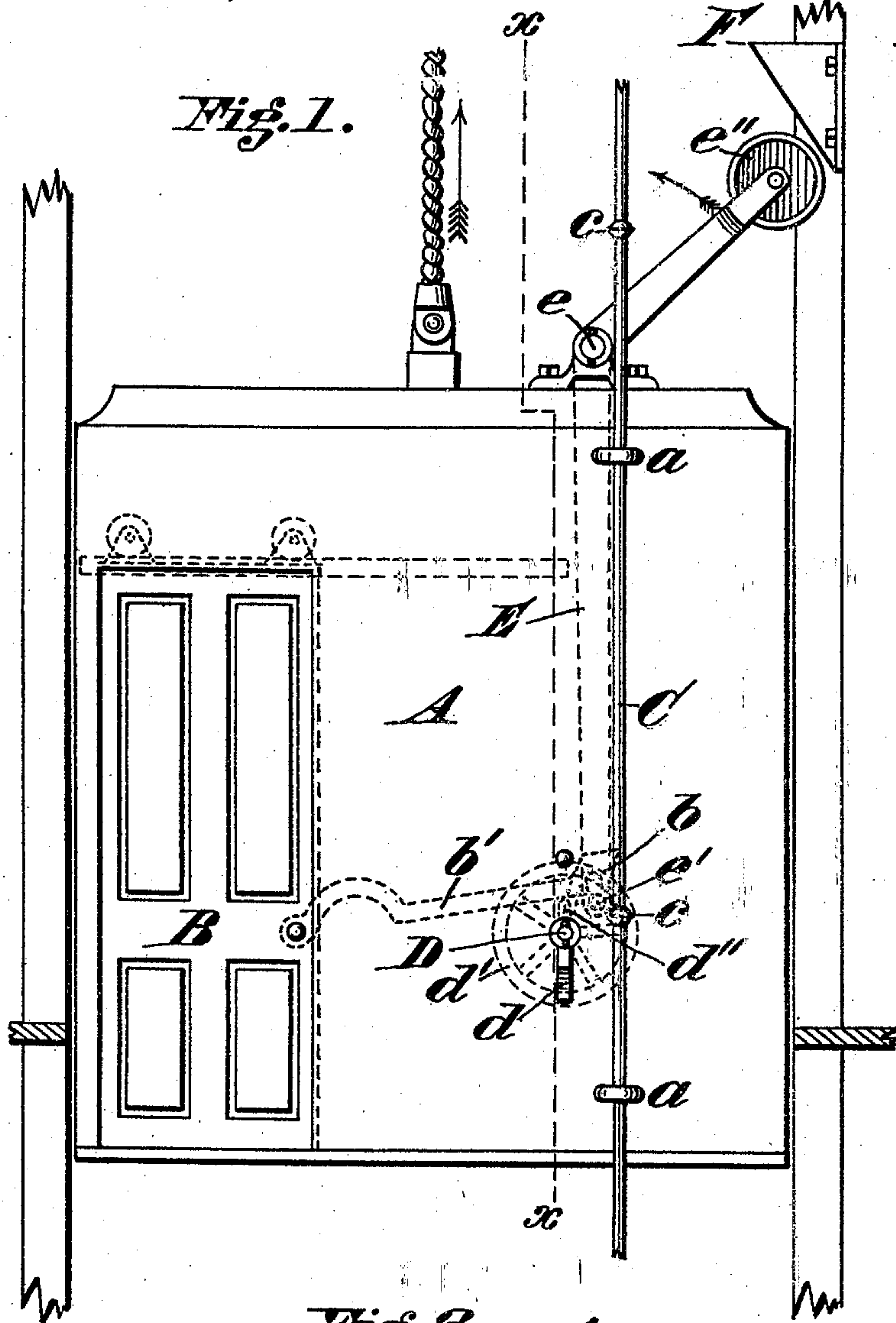


(No Model.)

H. M. & R. F. DARLING.  
ELEVATOR.

No. 328,294.

Patented Oct. 13, 1885.



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HENRY M. DARLING AND ROBERT F. DARLING, OF LINWOOD, OHIO.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 328,294, dated October 13, 1885.

Application filed January 26, 1885. Serial No. 153,981. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY M. DARLING and ROBERT F. DARLING, both citizens of the United States, residing at Linwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

Our invention consists in devices by means of which the elevator-car may be stopped at the proper place for each landing; in devices whereby the elevator-door may be automatically opened as the car reaches the landing and closed as the car leaves the landing, and in means for throwing out of engagement the mechanism which actuates the door when it is desired to pass a landing without stopping.

In the drawings, Figure 1 is a front view showing an elevator-car embodying our invention as it is about reaching a landing. Fig. 2 is a section on the line *xx* of Fig. 1, showing in elevation mechanism which stops the car and opens the door. Fig. 3 is a detail of a portion of the mechanism shown in Fig. 2.

A represents an elevator-car, and B the door of the car.

C is the actuating rod or cable, provided at suitable points with stops or buttons *c*, one for each landing. These buttons should be made tapering at the top and bottom to permit them to readily pass through the rings *a a*, secured to the car, which serve as guides for the cable or rod C. The side of the car in which the door is placed is preferably made with a double wall.

At a suitable point in the wall of the car, in the rear of the travel of the door, is mounted a shaft, D, having at its outer end a forked crank-arm, *d*, adapted to engage with the actuating rod or cable. To the other end is attached a suitable actuating device, shown here as a hand-wheel, *d'*, hereinafter called the "shipping-wheel." The actuating rod or cable, sometimes called the "hand-rope," may be connected with belt-shifting mechanism of the type shown in Letters Patent No. 302,325, granted us July 22, 1884, for improvement in elevators, or with a brake, as in the well-known Otis elevator, or with any devices for starting and stopping the elevator-car which are adapted to be actuated by the upward and downward movement of the hand rope or rod.

When it is desired to stop at a landing, the shaft D is revolved by means of the shipping-wheel *d'* until the forked arm *d* embraces the actuating rod or cable. As the car reaches a landing the forked arm comes in contact with a button, *c*, upon the actuating-rod, imparting motion to the same, and the car is thereby stopped exactly at the landing. To start the car, the shipping-wheel is revolved until the forked arm engages with the button upon its opposite face and moves the actuating-rod in the opposite direction. The crank-arm *d* should be sufficiently heavy to fall by gravity to a perpendicular position beneath the shaft D whenever released from contact with a button on the actuating-rod.

E is a bent lever, fulcrumed at *e*, the long end of which is provided with a pin, *e'*, adapted to engage with a notch, *b*, in the free end of an arm, *b'*, whose other end is pivotally attached to the car-door. The short end of the lever-arm E is adapted to engage with and be actuated by a series of cams, F, one for each landing, upon the walls or uprights of the elevator-well in the path of the lever-arm. The lower face of these cams should slope downward. The upper face is preferably, but not necessarily, substantially horizontal. In the form shown the short end of the lever-arm carries a weighted roller, *e''*. As the car moves the roller is carried therewith up and down the elevator-wall at a slight distance therefrom. As the car reaches a landing the roller engages with a cam, and, together with the short end of the lever-arm, is forced inward by the cam, thus moving the long end of the lever-arm outward and opening the door of the car. The cams should be so placed that the door will be fully opened as the car stops at the landing, and held open until the car has again started, when the roller, which should be made sufficiently heavy to overcome the resistance of the car-door, returns to its normal position, thereby closing the door.

As it is often desirable to pass a landing without stopping, and the door should always be closed while the car is in motion, provision should be made for throwing the mechanism which opens and closes the door out of engagement when a floor is to be passed without stopping. For this purpose a lug, *d''*, is mounted upon the opposite side of the shaft D to



the crank-arm  $d$  in the same vertical plane with the arm  $b'$ , the line of travel of which is immediately above the shaft  $D$ . When the forked arm is in engagement with the actuating-rod, the lug  $d''$  will be thrown out of the path of the arm  $b'$ ; but when the forked arm is in its position of rest the lug will assume a perpendicular position, thereby raising the arm  $b'$  and throwing it out of engagement with the pin  $e'$ , allowing the car to pass the landings without opening the doors until the shaft is revolved and the forked arm again thrown into engagement with the actuating-rod.

To prevent the lever  $E$  from being thrown out of position by the weight of the roller when it is disengaged from the arm  $b'$ , a stop,  $F'$  is fixed at a suitable point in the car-wall. It is obvious that a spring may be used in place of a weight or weighted roller to return the lever-arm to its normal position.

We do not limit ourselves to the specific means herein shown for connecting the lever-arm with the door, as it is apparent that a skilled mechanic could readily supply one or more substitutes therefor.

Some of the features herein described and claimed were shown and claimed in our application for Letters Patent for an improvement in elevators, filed October 16, 1884, Serial No. 145,631, and the present application, so far as it relates to said features, is a continuation of said former application.

We claim—

1. As an improvement in elevators, the combination, substantially as described, of one or more cams with a lever connected with the door of an elevator, and at its free end adapted to engage with and be actuated by a cam as the car reaches a landing, thereby opening the door.

2. As an improvement in elevators, the combination of one or more cams and a lever connected at one end with the door of an elevator, adapted at its free end to engage with and be actuated by a cam, thereby opening the door, and automatically restored to its normal position as the car leaves the landing, thereby closing the door.

3. As an improvement in elevators, the combination of one or more cams, with a lever connected at one end with the door of an elevator, and carrying at its free end a weighted roller adapted to engage with a cam as the car reaches a landing, thereby opening the door, and to return to its normal position as the car leaves the landing and the roller passes the cam, thereby closing the door.

4. The combination of one or more cams and a lever link-connected to the door of the elevator, and adapted at its free end to engage with a cam as the car reaches a landing, thereby opening the door, with a shipper adapted to throw the mechanism which opens the door out of engagement when a door is to be passed without stopping.

5. The combination, with a series of cams upon the wall of an elevator-well, of a bent lever, one end of which is link-connected to the door of the elevator-car, carrying at its free end a weighted roller adapted to engage with a cam as the car reaches a landing, thereby opening the door, and to return to its normal position as the car leaves the landing and the roller passes the cam, thereby closing the door.

6. The combination, with a series of buttons upon the actuating rod or cable of an elevator, of a shipping-wheel mounted upon a shaft, which also carries a forked crank-arm adapted, when said shipping-wheel is rotated in one direction, to embrace the actuating rod or cable to engage with the buttons thereon, thereby stopping the car, and when rotated in the opposite direction to engage with the opposite face of the button, thereby starting the car.

7. The combination of a series of cams upon the wall of an elevator-well, and a lever adapted at one end to engage with an arm pivotally attached to the door of the elevator-car, with a shipping-wheel adapted when at rest to hold the pivoted arm out of engagement with the lever, substantially as and for the purpose specified.

8. In combination with a series of buttons upon the actuating rod or cable of an elevator, a series of cams upon the wall of an elevator-well, a lever adapted at one end to engage with said cams, and at the other end adapted to engage with an arm pivotally attached to the door of an elevator-car, a shipping-wheel mounted upon a shaft carrying a forked crank-arm adapted to embrace the actuating rod or cable, and when in position to engage with the buttons thereon, and carrying also a lug adapted, when in its position of rest, to hold the pivoted arm out of engagement with the lever, substantially as and for the purpose specified.

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Witnesses:

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LEONARD VASSALL.