(No Model.) 3 Sheets—Sheet 1.

E. C. JENKINS.

ELEVATOR ATTACHMENT.

No. 572,996. Patented Dec. 15, 1896.

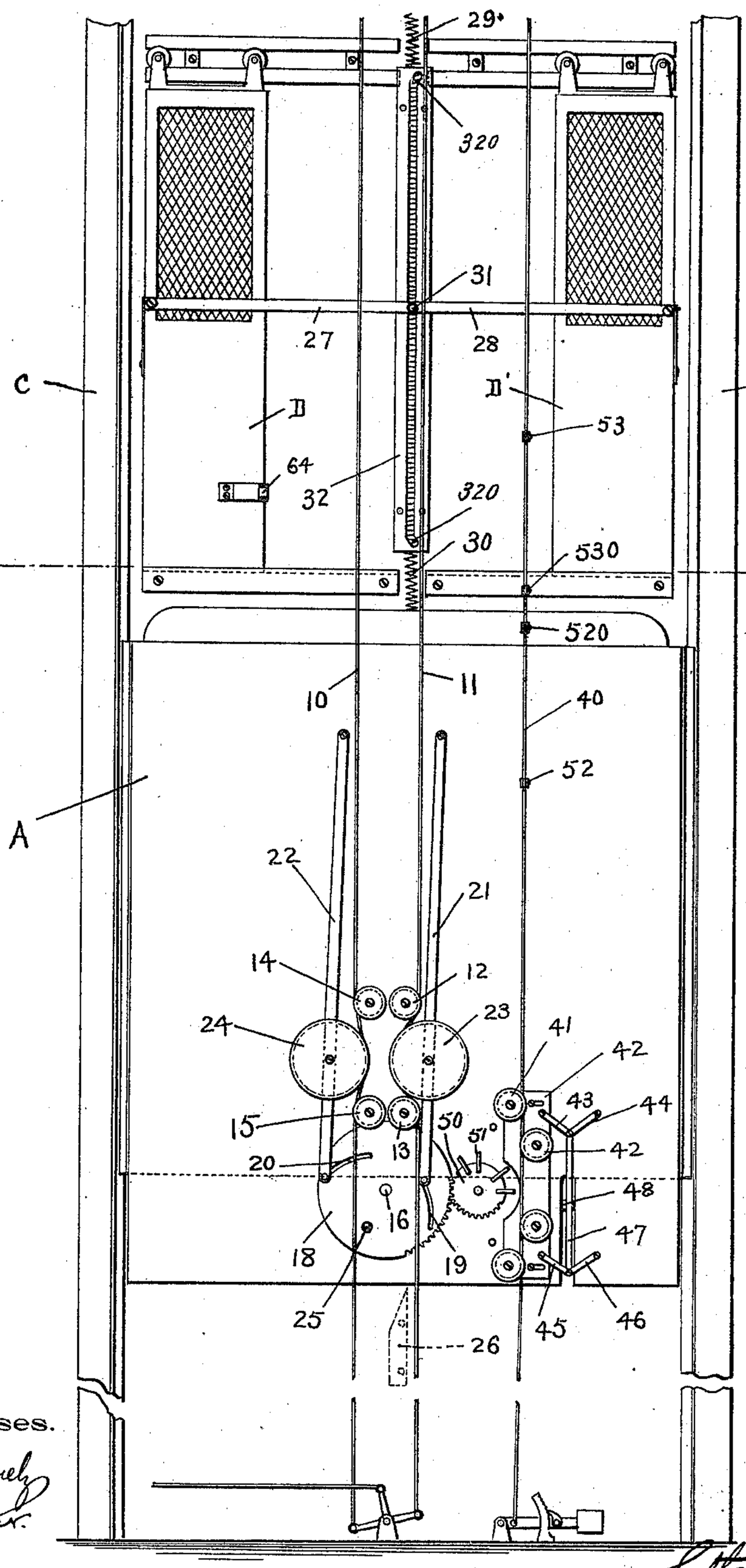

Fig. 1.

Witnesses.
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(No Model.) 3 Sheets—Sheet 2.

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ELEVATOR ATTACHMENT.

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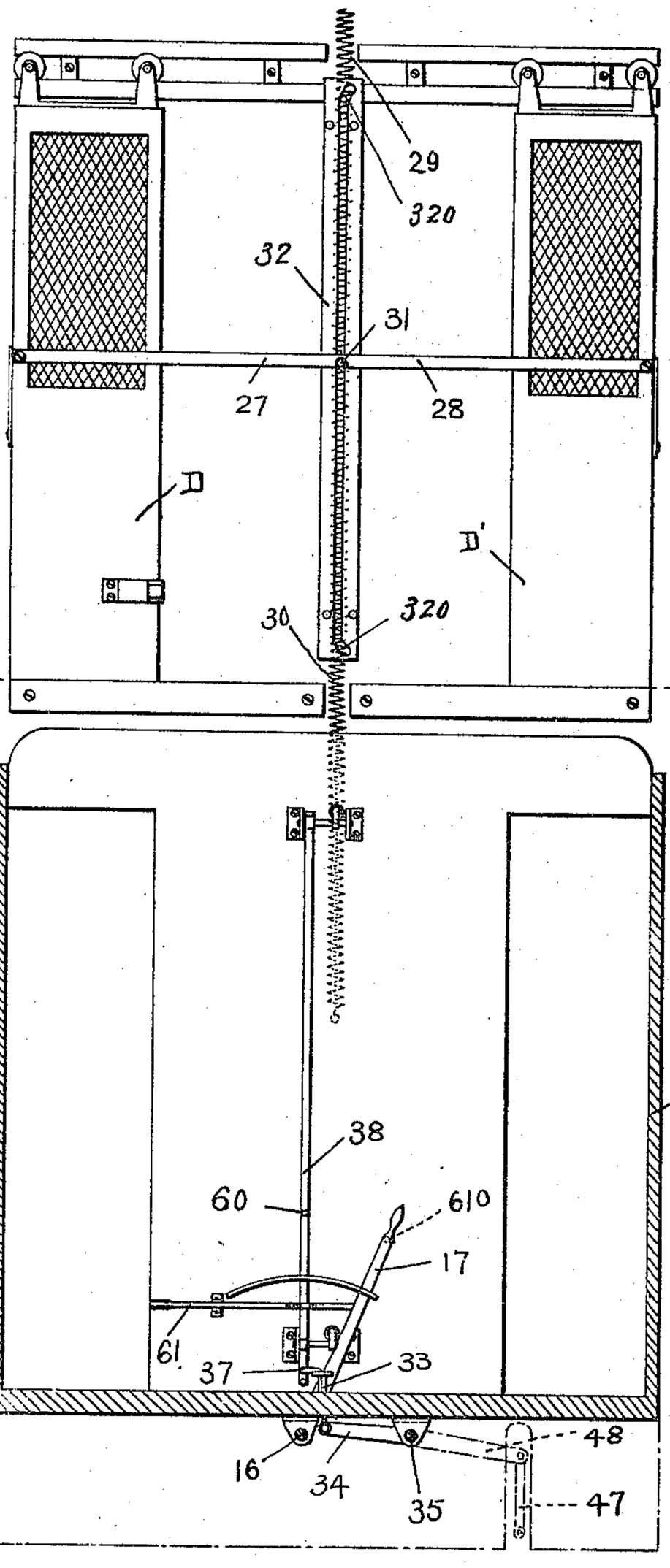

Fig. 2.

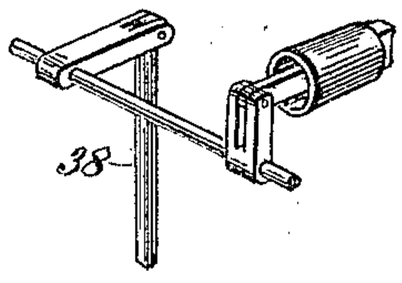

Fig. 10.

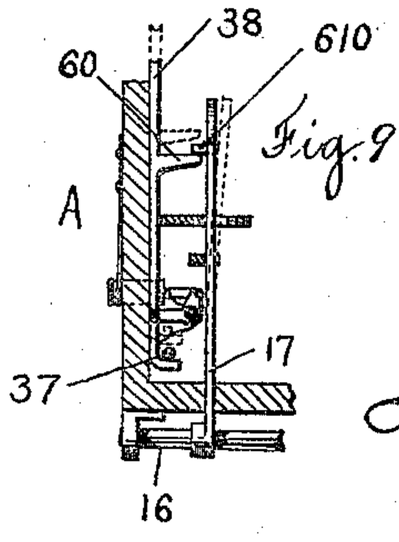

Fig. 9

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(No Model.) 3 Sheets—Sheet 3.

E. C. JENKINS.

ELEVATOR ATTACHMENT.

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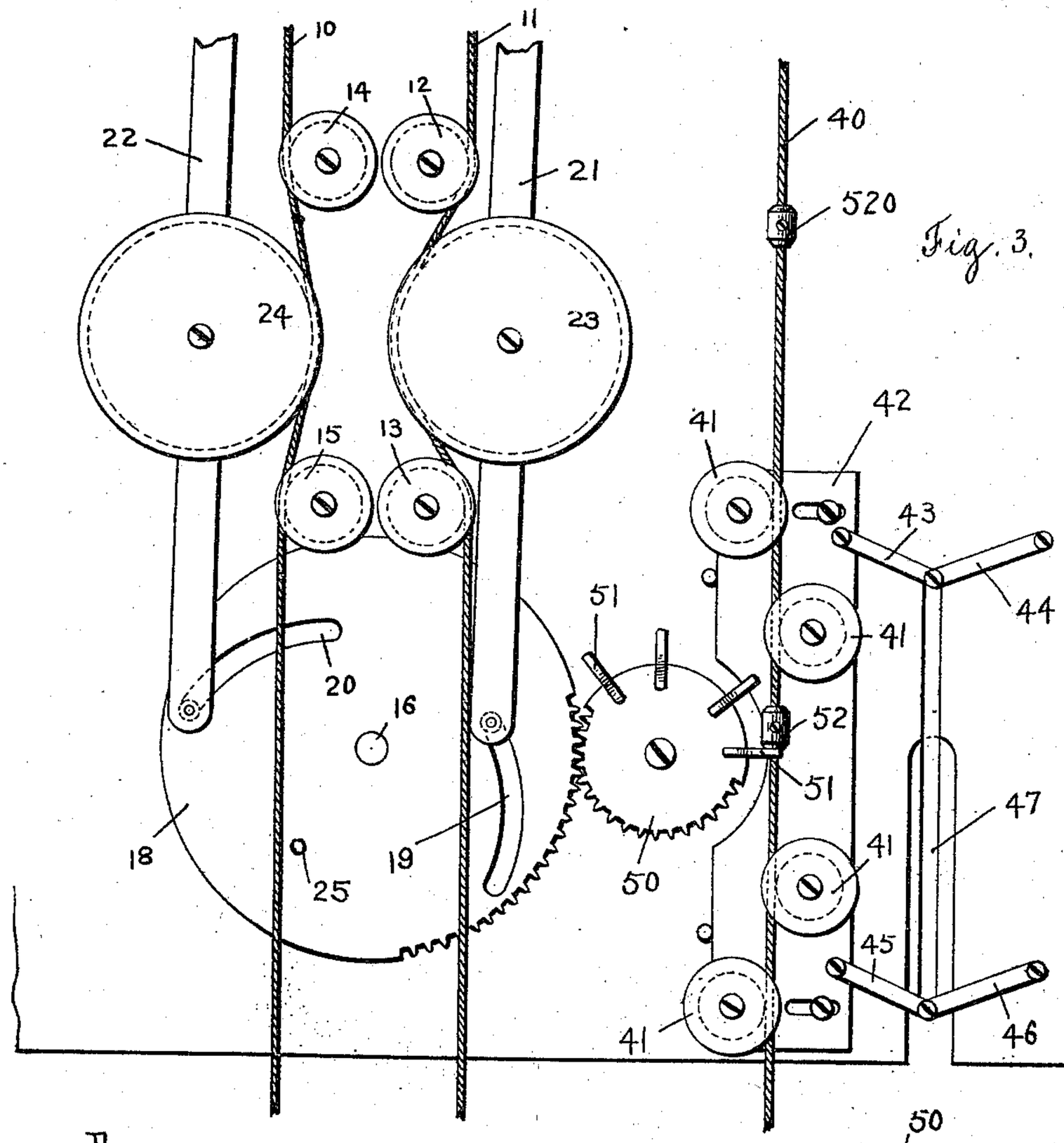


Fig. 3.

Fig. 4.

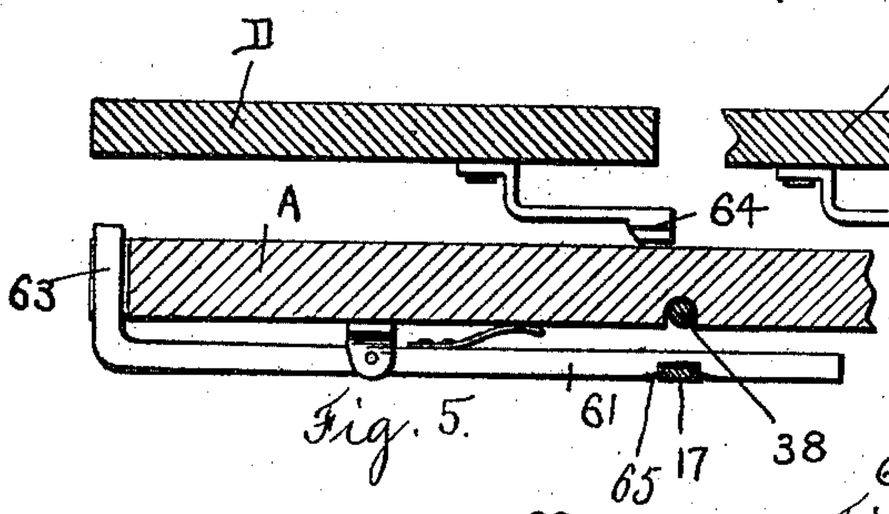
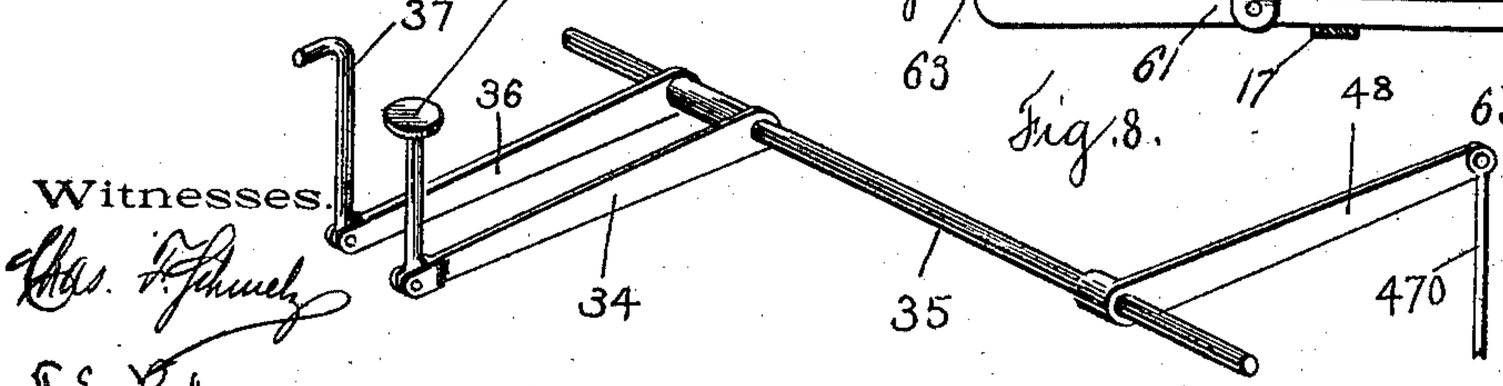


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.



Witnesses.
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UNITED STATES PATENT OFFICE.

EBENEZER C. JENKINS, OF SHREWSBURY, MASSACHUSETTS.

ELEVATOR ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 572,996, dated December 15, 1896.

Application filed April 6, 1896. Serial No. 586,307. (No model.)

To all whom it may concern:

Be it known that I, EBENEZER C. JENKINS, a citizen of the United States, residing at Shrewsbury, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Elevator Attachments, of which the following is a specification.

My invention relates to attachments for use in connection with passenger-elevators.

The especial objects of my invention are to provide simple and efficient elevator-controlling devices, to combine said controlling devices with automatic stopping and door-operating mechanism, and to provide means for preventing the operation of the controlling devices while the elevator-doors remain open.

To these ends my invention consists of the parts and combinations of parts, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying three sheets of drawings, Figure 1 is a rear view of an elevator-car provided with attachments constructed according to my invention. Fig. 2 is a transverse sectional view of the same. Figs. 3 and 4 are detail views illustrating the automatic stopping devices. Figs. 5, 6, and 7 are detail views illustrating different positions of the means which I preferably employ for preventing the operation of the controlling device while the elevator-doors are open. Fig. 8 is a detail view of the foot-controlled connections for stopping the car and opening the elevator-doors. Fig. 9 is a detail sectional view to be hereinafter referred to, and Fig. 10 is a detail view illustrating the connections for operating one of the spring-pressed plungers or projections for opening the elevator-doors.

An elevator-controlling device constructed according to my present invention comprises standing controlling ropes or cables mounted in the elevator-well, a take-up device for each of said controlling ropes or cables, and means for simultaneously operating said take-up devices at different relative speeds, so that the amount drawn up on one rope will equal the amount let out on the other rope, thus keeping the ropes taut.

Referring to the drawings and in detail, A designates an elevator-car, which is mounted to run on vertical ways B and C in the ordinary manner. Mounted in the elevator-well are the standing or stationary controlling-ropes 10 and 11, which are supported in any of the ordinary ways and are connected at their lower ends to operate any of the usual motor-controlling devices. The controlling-rope 11 passes around guide-pulleys 12 and 13, journaled on the rear face of the car, and the controlling-rope 10 passes around the guide-pulleys 14 and 15. Journaled below the floor of the car is an operating-shaft 16, which is provided with an operating-lever 17, as shown in Fig. 2, and a cam-actuating disk 18. The cam-slots 19 and 20 are formed in the disk 18 in position to engage with studs or rollers carried by the oscillating pivoted arms 21 and 22. Journaled on the oscillating arms 21 and 22 are deflecting or take-up pulleys 23 and 24 for acting upon the controlling-ropes 11 and 10, respectively.

The cam-slots 19 and 20 in the disk 18 are so proportioned that when the controlling-lever 17 is shifted the amount of rope drawn up on one of the controlling-cables by means of one of the take-up or deflecting pulleys will be equal to the amount of rope let out by the other deflecting-pulley on the other rope or cable. By means of this construction it will be seen that the controlling ropes or cables can be connected directly to any desired motor-controlling element, and as these ropes are allowed to hang substantially vertically in the elevator-well and are only slightly deflected by the take-up devices there will be comparatively little wear placed upon said controlling ropes or cables, and thus a slight amount of friction will be opposed to the travel of the car.

Extending from the face of the cam-disk 18 is a pin or stud 25. Suitable cams 26, as shown by the dotted lines in Fig. 1, may be located near the ends of the run in position to engage with the pin 25 to automatically stop the car when it has reached the end of its travel in either direction.

The doors D and D′ leading into the elevator-well are connected together by means of toggle levers or links 27 and 28. A stud 31, carried by the toggle-levers 27 and 28, may be arranged to fit into a slotted guide 32.

Springs, as 29 and 30, are arranged to normally hold the doors D and D′ closed.

The connections which I preferably employ for automatically opening the doors D and D′ are substantially the same as those described in my prior patent, No. 541,616, granted to me June 25, 1895. As shown, a foot-piece 33 is connected to an arm 34 to actuate a rock-shaft 35. An arm 36, extending from the rock-shaft 35, is provided with a hook 37, which is arranged to engage a pin or stud projecting from a vertical rod 38. The vertical rod 38 is provided with connections for moving projections or ledges from the front of the car into position to engage with the stud or roller 31 of the toggle-levers 27 and 28 of the doors D and D′.

As shown most clearly in Fig. 9, the vertical rod 38 is connected by small bell-crank levers and links to operate spring-pressed plungers or movable projections arranged substantially as shown in my Patent No. 541,616, before referred to.

The slotted guide 32 is provided near its ends with inclined slots or switch-sections 320. If for any reason the car should move away from the landing while either of its door-operating projections are still in engagement with the stud 31, the stud 31 would be moved into one of the switch-sections 320, and would thus be deflected or shifted out of the vertical path of the ledges or door-operating projections carried by the car. This construction provides a simple and efficient safety device for preventing the parts from becoming broken. Instead of employing two doors at each landing, which are arranged to be simultaneously operated, I may omit one of the doors and the toggle-lever which connects the same with the stud 31. In practice I prefer, however, to employ two doors, as illustrated, one being used as an entrance to and the other as an exit from the elevator-car.

A rope or cable 40, which carries a plurality of stops or projections, is mounted in the elevator-well and is trained over guide-pulleys 41, journaled on a slide 42 on the rear face of the car. The slide 42 is arranged to be actuated by two sets of toggle-links 43 and 44 and 45 and 46, which are connected together by means of a link 47. An arm 48, secured upon the rock-shaft 35, is connected by a link 470 to the joint between the toggle-levers 45 and 46. By means of this construction when the foot-piece 33 is depressed the rock-shaft 35 will be turned, and by means of the connections above described the slide 42 will be moved into the position illustrated in Fig. 3. A wheel or disk 50 is provided with gear-teeth, which mesh with and engage gear-teeth on the periphery of the cam-disk 18.

Carried by the disk or wheel 50 are arms or forks 51, which are arranged to engage with the stops or abutments on the rope 40 when the slide 42 has been shifted or actuated, as illustrated in Fig. 3. When the rope 40 is in its normal position, as shown in Fig. 1, the stops or abutments will not engage with the projections or forks 51.

In practice I preferably provide a plurality of stops for each floor or landing, said stops being arranged to shift the controlling mechanism to first retard the car and then to bring the car to rest opposite the desired landing. As shown in Fig. 3, the parts are in the position which they assume when the car is going up and the foot-controlled connections have been shifted to bring the car to rest. As the car ascends, one of the arms or forks 51 of the wheel 50 will first engage with and be actuated by a projection 52, which will shift the controlling mechanism so as to retard the car, and a second arm 51 will thereafter engage with a second stop 520, which will bring the car to rest. In a similar manner the stops 53 and 530 are secured upon the rope or cable 40 in position to first retard and then stop the car while the same is descending. As illustrated by dotted lines in Fig. 2, the controlling-lever 17 is provided with a trigger or projection 610. When the foot-controlled connections are operated to automatically stop the car at any desired landing, the lever 17 will be automatically shifted to its central position by the action of the stops and the trigger or projection 610 will be moved on top of and into engagement with a ledge or projection 60, carried by the vertical rod 38. By means of this construction the doors D and D′ will be held open.

When it is desired to release the doors to allow the same to close, the lever 17 may be sprung laterally to disengage the trigger or projection 610 from the ledge or projection 60, as illustrated in Fig. 10. When this has been done, the doors D and D′ will be released and will be automatically closed by their springs.

The means which I preferably employ for preventing the operation of the controlling devices while the elevator-doors are open are most clearly illustrated in Figs. 6 and 7. As illustrated, a spring-pressed bar or catch 61 is pivoted on the inside of the car and is provided with a notch for normally engaging with the operating-lever 17 when the same is in its central position. At one end the lever 51 is bent outwardly, as at 63, into position to engage with a cam 64, mounted on the door D. By means of this construction it will be seen that so long as the door D remains open the catch 61 will engage with the operating-lever 17 and will prevent said lever being moved from its central position. When the door D closes, the cam 64 will engage with the lever 61 and will move the same back to the position illustrated in Fig. 6 to release the operating-lever, so that the same may be shifted or moved, as desired. The spring-catch 61 is provided with small cam-sections 65 at each side of the retaining-notch which engages the operating-lever 17. By means of this construction the operating-lever when shifted from its central position will engage

one of the cam-sections 65 and will move the spring-catch 61 slightly back, as illustrated in Fig. 7. By means of this construction the projecting end 63 will be slightly withdrawn and a slight clearance will be provided between the spring-catch and the cam-plate 64, carried by the door.

It will thus be seen that when the controlling-lever has been shifted from its central position, as shown in Fig. 7, the spring-catch will be moved in such a position that it will not engage with the cam-plates of the elevator-doors, and the scraping or wear due to the unnecessary engagement of these parts when the elevator-car moves up and down past a landing without stopping thereat will be entirely avoided.

I am aware that many changes may be made in my elevator attachments by those who are skilled in the art, and that certain parts may be used in different locations and different combinations without departing from the scope of my invention as expressed in the claims. I do not wish, therefore, to be limited to the construction which I have shown and described; but

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

1. The combination of controlling ropes or cables, a take-up device for each of said controlling ropes or cables, and means for moving said take-up devices at different relative speeds, so that the amount drawn up on one rope will equal the amount let out on the other rope, substantially as described.

2. The combination of controlling ropes or cables, guide-pulleys mounted on the car, an oscillating take-up device for each of said controlling ropes or cables, and means for simultaneously moving said take-up devices at different relative speeds so that the amount drawn up on one rope will equal the amount let out on the other rope, substantially as described.

3. The combination of controlling ropes or cables, a take-up device for each of said controlling ropes or cables, and a cam for simultaneously operating said take-up devices so that the amount drawn up on one rope will equal the amount let out on the other rope, substantially as described.

4. The combination of controlling ropes or cables, a pivoted arm and a deflecting-pulley for each of said ropes, and a cam for simultaneously actuating said arms so that the amount drawn up on one rope will equal the amount let out on the other rope, substantially as described.

5. The combination of controlling ropes or cables, a take-up device for each of said controlling ropes or cables, and a shaft carrying an operating-lever and a cam-disk, said cam-disk being connected to simultaneously actuate the take-up devices so that the amount drawn up on one rope will equal the amount let out on the other rope, substantially as described.

6. The combination of controlling ropes or cables, guide-pulleys mounted on the car, a pivoted arm and deflecting-pulley for each controlling-rope, and a shaft carrying an operating-lever and a cam-disk, said cam-disk having slots for simultaneously operating the pivoted arms, substantially as described.

7. The combination of an elevator-car, controlling devices carried by said car, stopping devices mounted in the elevator-well, and means for moving said stopping devices into position to actuate said controlling devices, substantially as described.

8. The combination of an elevator-car, controlling devices carried by said car, stopping devices mounted in the elevator-well, and means carried by the car for moving said stopping devices into and out of operative position, substantially as described.

9. The combination of an elevator-car, controlling devices carried by said car, a rope or cable mounted in the elevator-well, stops mounted on said cable, and means for shifting the cable to bring the stops into and out of operative position, substantially as described.

10. The combination of an elevator-car, controlling devices carried by said car, a rope or cable mounted in the elevator-well, stops mounted upon said cable, and foot-controlled connections mounted in the elevator-car for bringing the stops into and out of operative position, substantially as described.

11. The combination of an elevator-car, controlling devices carried by said car, a rope or cable mounted in said elevator-well, a plurality of stops mounted on said rope, and means for shifting the cable so that the stops may act successively to retard the motion of the car, and then stop the same, substantially as described.

12. The combination of an elevator-car, a controlling mechanism carried by said car, a disk connected to said controlling mechanism and having projecting arms or forks, a rope or cable, stops mounted on said cable, and means for shifting the rope or cable to bring the stops into position to engage with said arms or forks, substantially as described.

13. The combination of an elevator-car, controlling devices carried by said car, a rope or cable mounted in the elevator-well, stops mounted on said cable, a slide having guide-pulleys for engaging said rope or cable, and foot-controlled connections for shifting said slide to bring the stops into and out of operative position, substantially as described.

14. The combination of a door, a link connected to said door, a slotted guide, a stud or roller carried by the link and fitting into said slotted guide, and springs for normally keeping the link in its central position to hold the door closed, substantially as described.

15. The combination of an elevator-car, a door leading into the elevator-well, a link connected to said door, a slotted guide for receiving a stud or roller carried by said link,

and means carried by the elevator-car for engaging the stud or roller, substantially as described.

16. The combination of an elevator-car, a door leading into the elevator-well, a link connected to said door, a stud or roller carried by said link, a slotted guide for receiving said stud or roller, and means mounted in the elevator-car for engaging said stud or roller to open the door, said slotted guide being provided with inclined or switch sections, substantially as and for the purpose set forth.

17. The combination of an elevator-car, a controlling device mounted in said car, a door leading into the elevator-well, a lock for the controlling device, and an actuating device for releasing the lock when the elevator-door is closed, said parts being arranged to leave a clearance between the lock and its actuating device when the car is in motion.

18. The combination of an elevator-car, an operating-lever mounted in said car, a spring-catch for engaging said operating-lever, an elevator-door, and a cam-plate mounted on the elevator-door for releasing the spring-catch from the operating-lever when the elevator-door is closed, said parts being arranged so that the spring-catch will be shifted to allow a clearance between said catch and the cam-plate, when the operating-lever is shifted from its central position, substantially as described.

19. The combination of an elevator-car, an operating-lever 17 mounted in said car, a spring-catch 61 for engaging said operating-lever, said spring-catch being provided with cam-sections 65 at each side of its retaining-notch, an elevator-door D, and a cam-plate 64 mounted on the elevator-door for releasing the spring-catch from the operating-lever when the elevator-door is closed, substantially as described.

20. The combination of an elevator-car, a controlling-lever mounted in said car, a door leading into the elevator-well, and a catch or trigger carried by and extending from said controlling-lever, and arranged to hold the door open while the car is opposite the landing and to release the door when the controlling-lever is shifted, substantially as described.

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

EBENEZER C. JENKINS.

Witnesses:
LOUIS W. SOUTHGATE,
PHILIP W. SOUTHGATE.