

No. 789,895.

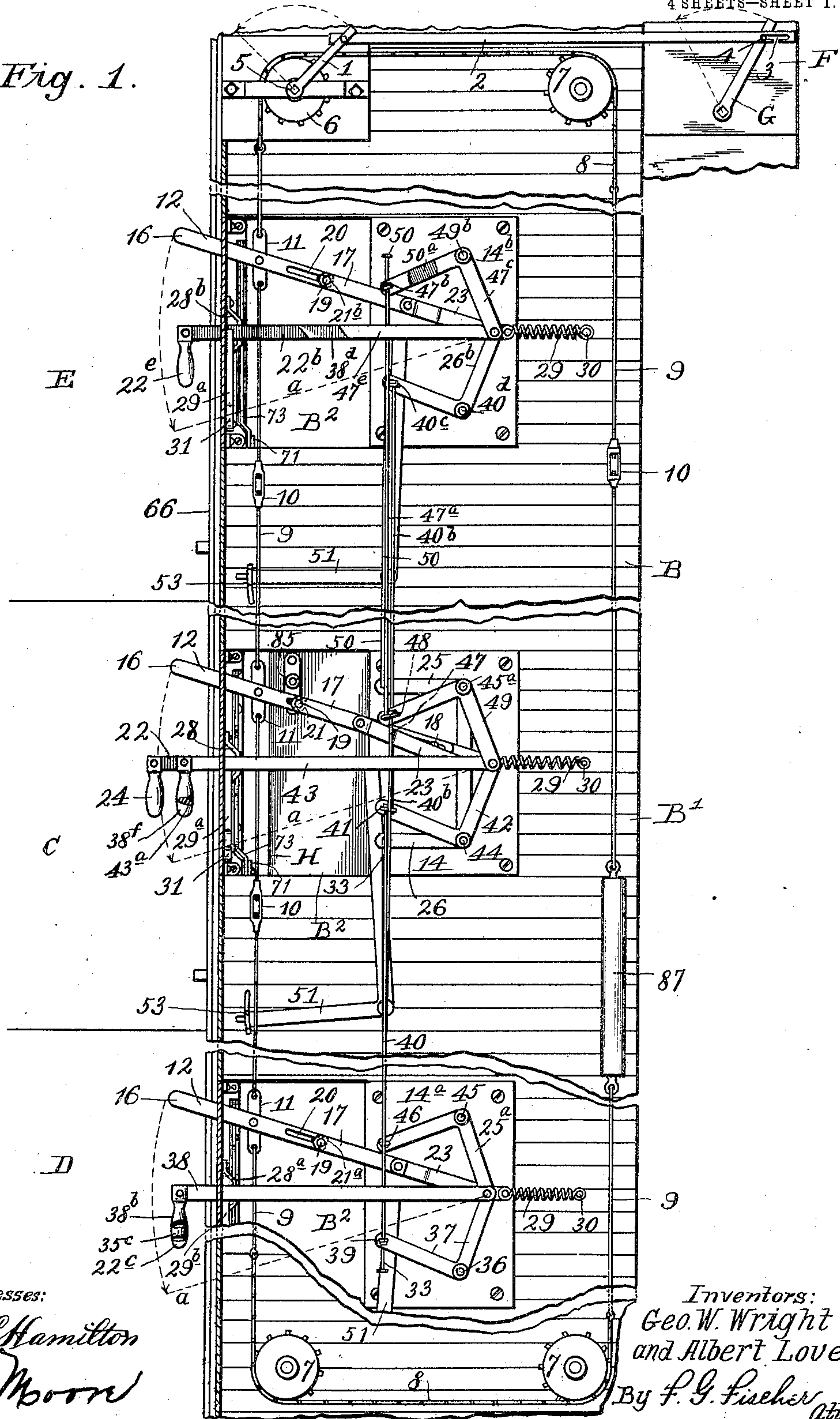
PATENTED MAY 16, 1905.

G. W. WRIGHT & A. LOVE.  
MECHANISM FOR AUTOMATICALLY CONTROLLING ELEVATOR CARS  
AND THE DOORS LEADING THERETO.

APPLICATION FILED MAR. 6, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

R. C. Hamilton  
J. Moore

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Geo. W. Wright  
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By F. G. Fischer atty.

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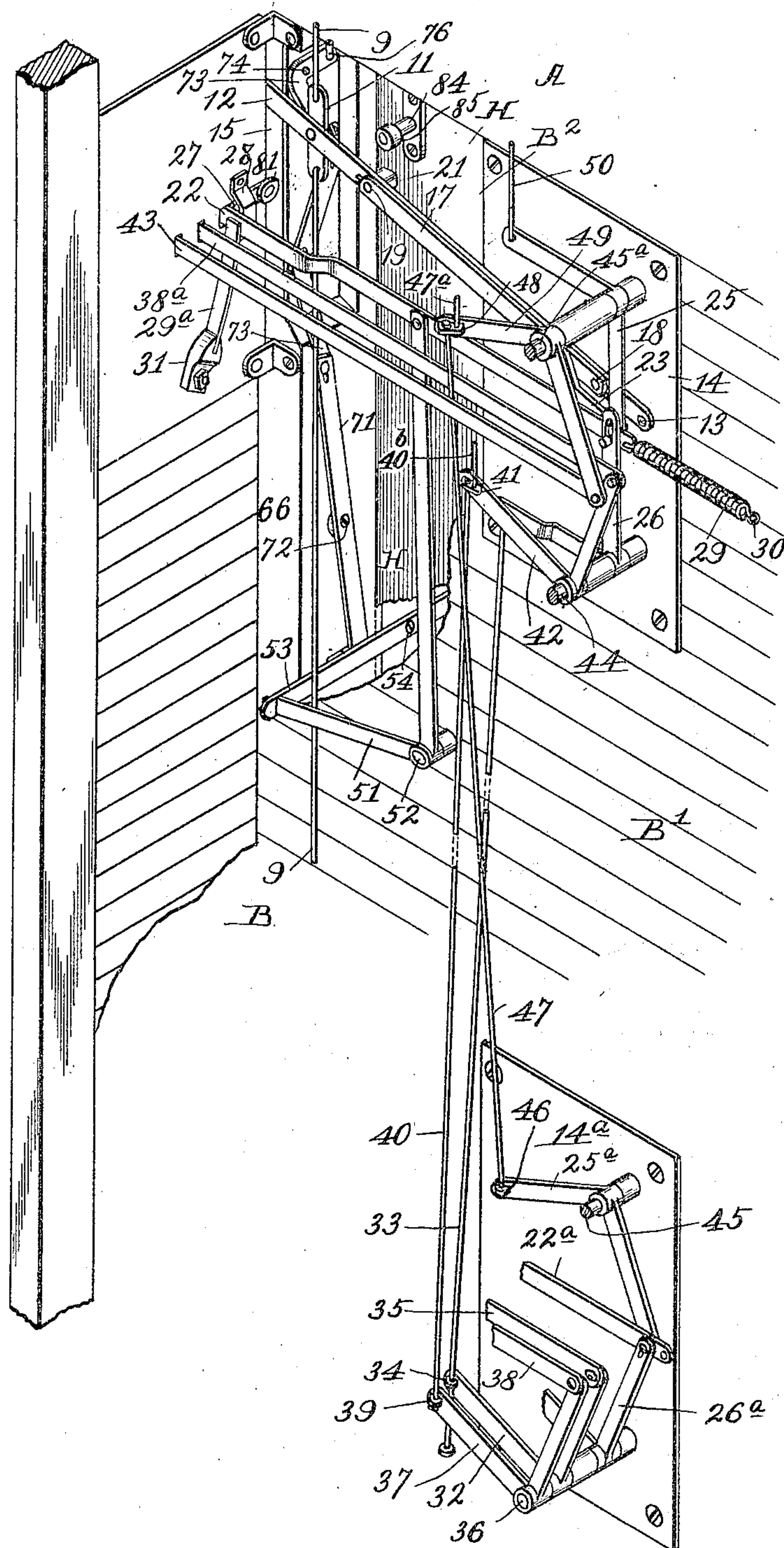
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

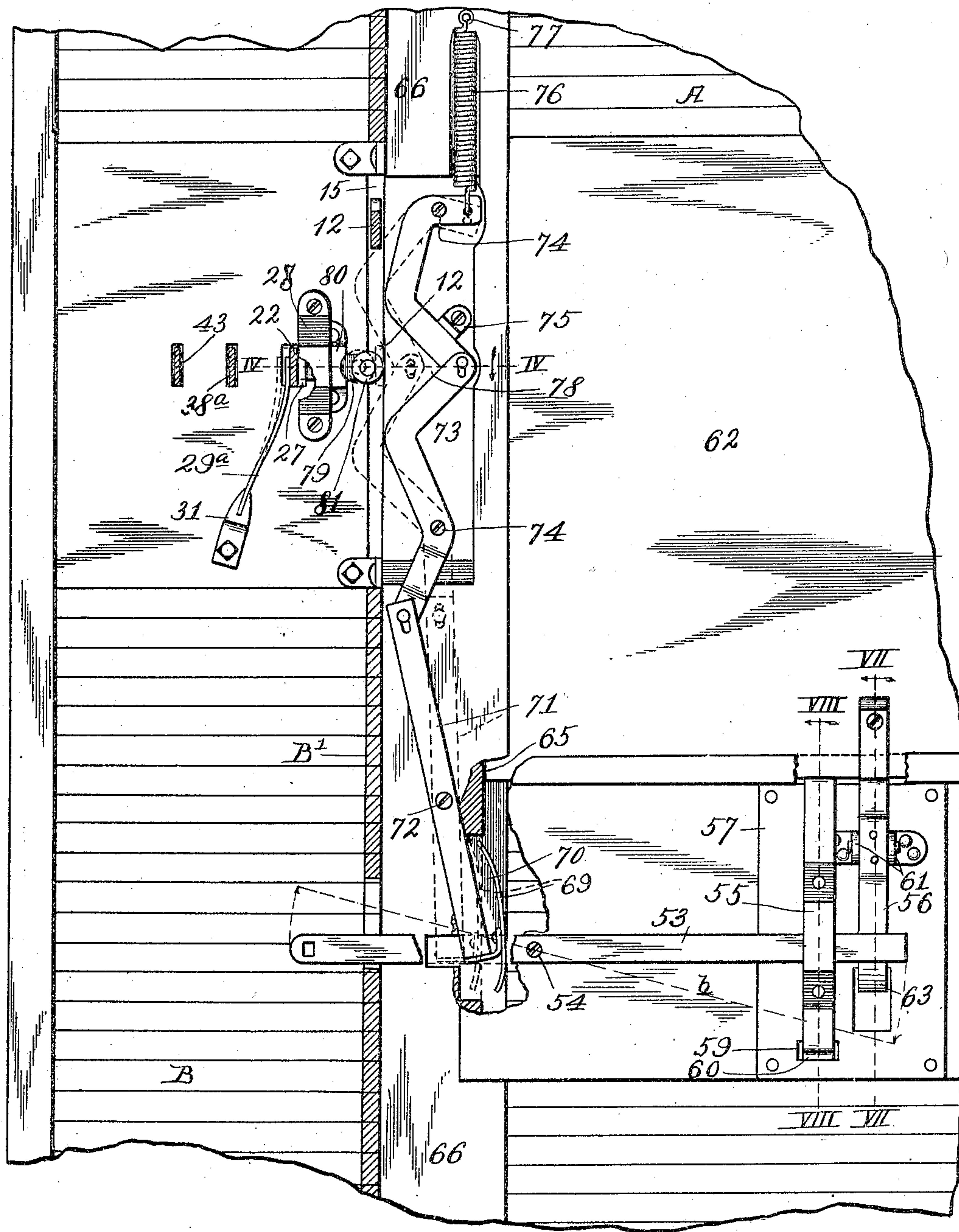


Fig. 3.

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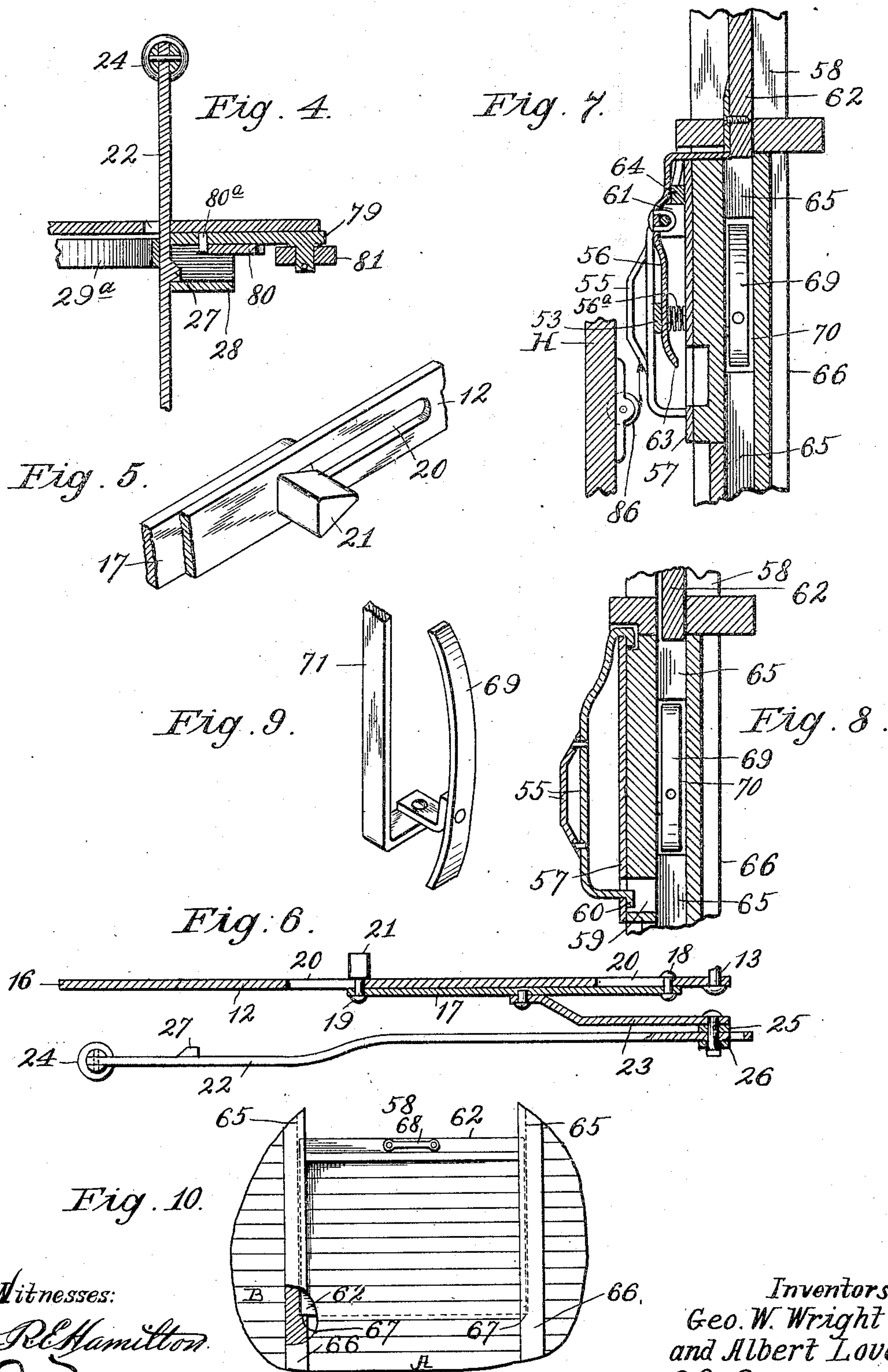
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4 SHEETS—SHEET 4.



Witnesses:

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J. Moore

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# UNITED STATES PATENT OFFICE.

GEORGE W. WRIGHT AND ALBERT LOVE, OF KANSAS CITY, MISSOURI.

MECHANISM FOR AUTOMATICALLY CONTROLLING ELEVATOR-CARS AND THE DOORS LEADING THERETO.

SPECIFICATION forming part of Letters Patent No. 789,895, dated May 16, 1905.

Application filed March 6, 1905. Serial No. 248,377.

*To all whom it may concern:*

Be it known that we, GEORGE W. WRIGHT and ALBERT LOVE, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Mechanism for Automatically Controlling Elevator-Cars and the Doors Leading Thereto, of which the following is a specification.

Our invention relates to improvements in elevators; and it consists of mechanism whereby a person on one floor of a building may start a car from any floor of said building and stop said car at any floor desired.

The invention consists in the novel construction, arrangement, and combination of parts hereinafter described, and pointed out in the claims.

Referring now to the accompanying drawings, which illustrate the invention, Figure 1 represents a vertical broken section of an auxiliary shaft adjoining the main elevator-shaft containing our mechanism for starting and stopping the car. Fig. 2 is a broken perspective view of said shaft containing one complete set of the car starting and stopping mechanism. Fig. 3 is an enlarged side elevation of a compound locking-lever, a latch for holding the main-shaft door in a closed position and parts connected thereto. Fig. 4 is an enlarged cross-section taken on the line IV IV of Fig. 3. Fig. 5 is an enlarged broken perspective of a starting and stopping lever employed in carrying out the invention. Fig. 6 is a longitudinal section of the starting and stopping lever and a pull-bar connected thereto. Fig. 7 is a vertical section taken on line VII VII of Fig. 3, showing a latch and its operating mechanism for holding the shaft-door in a closed position. Fig. 8 is an enlarged broken section taken on line VIII VIII of Fig. 3, showing a cam for releasing the latch from the shaft-door. Fig. 9 is a broken perspective view of the lower portion of a shoe-lever employed in carrying out our invention. Fig. 10 is a broken elevation of the front wall of the shaft, showing stops for limiting the downward movement of the shaft-door.

In the drawings we have shown three floors of a building, each of which is provided with

a set of our controlling mechanism, and as each set is alike we will enter into a detail description of the construction and operation of but one set.

A designates the main shaft of the elevator in which the car travels.

B designates an auxiliary shaft arranged beside the main shaft for the reception of our car starting and stopping mechanism.

C designates one of the intermediate floors of the building. D designates the floor below, and E designates the floor above said floor C.

F designates a controller of any usual or preferred type for starting and stopping the motor whereby the car is operated. Said controller is operated by a crank G, connected to a crank 1 by means of a connecting-bar 2, provided at its rear end with a slot 3, loosely engaging a pin 4 projecting from crank G in order that the latter may move independently of crank 1 a certain distance. Crank 1 is secured at its lower end to a shaft 5, upon which is rigidly mounted a sprocket-wheel 6, connected to idlers 7 by an endless connection consisting of sprocket-chains 8, rods 9, turnbuckles 10 for taking up the slack in said endless connection, and links 11, to which starting and stopping levers 12 are pivotally secured. Each of levers 12 is fulcrumed upon a pin 13, projecting from a supporting-plate 14, secured to a partition B'. The forward portions of levers 12 project through slots 15 in the front wall of shaft B and terminate in handles 16.

17 designates a sliding bar secured to lever 12 by bolts 18 19 extending through slots 20 in said lever. Bolt 19 is provided with a lug 21.

Sliding bar 17 is operated by means of a primary pull-bar 22, pivotally secured thereto by a link 23. Pull-bar 22 extends through an opening in the front wall of shaft B and is provided with a pivoted handle 24, so that the latter may drop to a vertical position when not in use instead of projecting outwardly in the way. The rear portion of the pull-bar is pivotally secured to the adjacent ends of bell-crank levers 25 26 and provided near its forward end with a shoulder 27, which engages a keeper 28 when the pull-bar is drawn out-



wardly to the position shown in Figs. 1 and 2 and holds said pull-bar in this position against the action of a retractile spring 29, secured at its opposite ends to the rear terminal of the pull-bar, and a pin 30 projecting from partition B'.

Shoulder 27 is yieldingly held in engagement with its keeper by a flat spring 29<sup>a</sup>, bearing at its upper end against the pull-bar and secured to the front wall of shaft B with a clip 31.

Bell-crank lever 26 is connected to a bell-crank lever 32 by a connecting-rod 33 passing loosely through an eye 34, so that the downward movement of said connecting-rod will not affect bell-crank lever 32 or a secondary pull-bar 35, to which it is connected. Pull-bar 35 is provided with a pivoted handle 35<sup>a</sup>. Eye 34 is pivotally connected to one end of bell-crank lever 32, which latter is fulcrumed upon a shaft 36, projecting from a plate 14<sup>a</sup>, secured to partition B'.

37 designates another bell-crank lever fulcrumed upon shaft 36 and pivotally secured at one end to a secondary pull-bar 38, projecting through the front wall of shaft B and provided with a pivoted handle 38<sup>b</sup>. The opposite end of bell-crank lever 37 is provided with a pivoted eye 39, loosely embracing the lower portion of a connecting-rod 40, extending upwardly through an eye 41, pivoted to one end of a bell-crank lever 42, pivotally secured at its opposite end to a secondary pull-bar 38<sup>a</sup>, provided with a pivoted handle 38<sup>c</sup>. Lever 42 is fulcrumed upon a shaft 44, projecting from plate 14.

26<sup>a</sup> designates a bell-crank lever fulcrumed upon shaft 36 and pivotally secured at one end to a main pull-bar 22<sup>a</sup>, corresponding in construction and operation to pull-bar 22 and provided with a pivoted handle 22<sup>c</sup>.

25<sup>a</sup> designates a bell-crank lever fulcrumed upon a shaft 45, projecting from plate 14<sup>a</sup>. One end of said bell-crank lever is pivotally secured to pull-bar 22<sup>a</sup>, and its opposite end is provided with a pivoted eye 46, loosely embracing the lower end of a connecting-rod 47, extending upwardly through an eye 48, pivotally secured to the forward end of a bell-crank lever 49, fulcrumed upon a shaft 45<sup>a</sup>, projecting from plate 14. Bell-crank lever 49 is pivotally secured at its lower end to a secondary pull-bar 43, projecting into apartment C through an aperture in the front wall of shaft B. Pull-bar 43 is provided with a pivoted handle 43<sup>a</sup>.

50 designates a connecting-rod pivotally secured at its lower end to the forward end of bell-crank lever 25 and loosely embraced at its upper portion by an eye pivotally secured to one end of a bell-crank lever 50<sup>a</sup>, fulcrumed upon a shaft 49<sup>b</sup>, projecting from a supporting-plate 14<sup>b</sup>, secured to partition B'.

Bell-crank lever 50<sup>a</sup> is pivotally secured at its opposite end to a secondary pull-bar 38<sup>d</sup>.

40<sup>b</sup> designates a connecting-rod loosely embraced at its opposite ends by eye 41 and an eye 40<sup>c</sup>, which latter is pivoted to one end of a bell-crank lever 26<sup>b</sup>, fulcrumed upon a pin 40<sup>d</sup>, projecting from plate 14<sup>b</sup>.

Bell-crank lever 26<sup>b</sup> is pivotally secured at its opposite end to a primary pull-bar 22<sup>b</sup>, provided with a pivoted handle 22<sup>e</sup>.

47<sup>a</sup> designates a connecting-bar loosely embraced at its opposite ends by eye 48 and an eye 47<sup>b</sup>, which latter is pivoted to one end of a bell-crank lever 47<sup>c</sup>, fulcrumed upon pin 49<sup>b</sup> and pivotally secured at its opposite end to a secondary pull-bar 47<sup>e</sup>.

Each main pull-bar is pivotally connected to a large bell-crank lever 51, fulcrumed upon a pin 52 and connected at its lower end to a latch-lever 53, fulcrumed upon a pin 54 and extending between a cam 55 and a latch 56. Cam 55 is pivotally secured at its upper end to the upper edge of a plate 57, which latter is secured to the inner side of the front wall of shaft A, just beneath one of the doorways 58 leading into said shaft. The lower portion of cam 55 operates in a slot 59 and has its lower terminal 60 bent downwardly to contact with the inner side of plate 57, which limits the outward movement of said terminal. Latch 56 is pivotally secured to ears 61 and bent inwardly at its upper portion to engage the under side of a door 62 (see Fig. 7) for the purpose of supporting the latter in a closed position.

56<sup>a</sup> designates an expansion-spring interposed between plate 57 and latch 56 for normally holding the upper end of the latter inwardly beneath the door.

The lower portion 63 of latch 56 is curved inwardly, so that when the adjacent end of the latch-lever 53 is elevated it will pass upwardly between the cam and said latch to the position shown in Figs. 3 and 7.

The inward movement of the upper portion of latch 56 is limited by a stop 64, secured to plate 57. Door 62 operates in grooves 65 in the adjacent sides of door-jambs 66, and its downward movement is limited by stops 67 at the lower terminals of said grooves. Said door is provided with a handle 68, affording a convenient handhold when it is desired to raise the door for the purpose of closing opening 58.

69 designates a shoe extending through a slot 70 and arranged in the path of the door, as shown in Fig. 3. Said shoe is rigidly secured to the lower end of a shoe-lever 71, fulcrumed upon a screw 72 and pivotally connected at its upper end to the lower terminal of a compound locking-lever 73, composed of two irregular-shaped members fulcrumed upon screws 74. Said locking-lever is normally held in the extended position shown in Fig. 3 and in contact with a stop 75 by means of a retractile spring 76, secured at its opposite ends to the upper end of the compound ;



lever and a pin 77, which latter projects from one of the door-jambs.

The locking-lever 73 has a V-shaped portion 78 arranged in line with a sliding bolt 79, arranged in a clip 80 and provided at its end adjacent to said locking-lever with an antifric-  
 5 tion-roller 81, with which the starting and stopping lever 12 contacts when it is depressed to the position shown by dotted lines, Fig. 3.

The outward movement of said bolt is controlled by a pin 80<sup>a</sup>, contacting with the adjacent edge of clip 80. Pull-bar 22 is normally held in contact with the opposite end of sliding bolt 79 by spring 29<sup>a</sup>.  
 15 H designates a car arranged to travel in shaft A and provided at one side with an arm 84, carrying an antifric-tion-roller 85, adapted to contact with lugs 21, 21<sup>a</sup>, and 21<sup>b</sup>, which project through openings B<sup>2</sup> in partition B' for that purpose. The front lower portion of car H is also provided with an antifric-tion-roller 86, adapted to contact with cam 55 when the car is traveling in either direction. (See Fig. 7.)

87 designates a counterweight secured to two of rods 9 for the purpose of holding levers 12 either in the raised position (shown by full lines in Fig. 1) or in the depressed position, (indicated by dotted lines A.)

If car H is resting at floor E and a person on floor C desires to have it travel to the latter floor, pull-bar 22 is drawn outwardly to the position shown in Figs. 1 and 2. This movement draws lug 21 into the path of roller  
 35 85 and draws one end of lever 53 upwardly between cam 55 and latch 56, as shown in Figs. 3 and 7. The car is then started downwardly by elevating lever 12 to the position shown in Fig. 1. As the car descends roller

85 will contact with lug 21 and depress lever 12 to a horizontal position. As lever 12 descends it will contact with roller 81 and force the sliding bolt 79 backwardly until shoulder 27 of pull-bar 22 is released from its keeper.

The pull-bar is then immediately drawn back to its normal position by spring 29 and draws lug 21 backwardly out of the path of roller 85. It also through bell-crank lever 51 permits one end of lever 53 to drop to the position indicated by dotted lines b, Fig. 3, out of engagement with the latch. Just before lever 12 contacts with roller 81 roller 86 will contact with the upper bevel-surface of cam 55 and press the lower end of the latter backwardly almost to the inner end of slot 59.

This movement of the cam springs the adjacent end of lever 53 backwardly and causes it to release latch 56 from door 62. The latter then drops by gravity until it strikes stops  
 60 67. In its descent one of the lower corners of the door strikes shoe 69 and forces it backwardly into slot 70 and through the instrumentality of lever 71 throws the compound locking-lever 73 to the dotted position shown  
 65 in Fig. 3, so that its V-shaped portion will en-

gage the upper and lower edges of lever 12 and firmly lock the latter in a horizontal position. When lever 12 attains a horizontal position, cranks G and I will occupy an upright position and stop the motor, so that the  
 70 car will stop at the doorway communicating with floor C.

As the levers 12 are connected to each other, it is obvious that a person on any of the floors will be unable to start the car until the door  
 75 on floor C is raised to a closed position, and thus releases shoe 69. When this occurs, spring 76 immediately returns the locking-lever to its normal position, leaving levers 12 free to be raised or lowered.

If the person on floor C desires to send the car to floor D, pull-bar 43 is drawn outwardly, and thus forces pull-bar 22<sup>a</sup> outwardly, through the instrumentality of bell-crank lever 46 and connecting-rod 47, until its shoulder  
 85 engages keeper 28<sup>a</sup>. This draws lug 21<sup>a</sup> into the path of roller 85, so that the latter will contact therewith as the car moves downwardly. As the car descends it will be stopped on floor D, and the door closing the doorway  
 90 communicating with said floor will be opened, as above described. If the person on floor C, however, desires to return the car to floor E, pull-bar 38<sup>a</sup> is drawn outwardly until the shoulder on pull-bar 22<sup>b</sup> engages its keeper  
 95 28<sup>b</sup>. This outward movement of pull-bar 22<sup>b</sup> draws lug 21<sup>b</sup> into the path of roller 85. The car is then started upwardly by lowering levers 12 to the position shown by dotted lines, Fig. 1.

If the car is resting at floor D and a person on said floor desires to send it to floor E, pull-bar 38 is drawn outwardly. This movement of said pull-bar, through the instrumentality of bell-crank lever 37, connecting-rod  
 105 40, bell-crank lever 42, connecting-rod 40<sup>b</sup>, and bell-crank lever 26<sup>b</sup>, will force pull-bar 22<sup>b</sup> outwardly until its shoulder engages keeper 28<sup>b</sup>. The outward movement of pull-bar 22<sup>b</sup> will draw lug 21<sup>b</sup> into the path of roller  
 110 85, so that when the car is sent upwardly by the depression of levers 12 said roller 85 will contact with lug 21<sup>b</sup>, raise levers 12 to a horizontal position, stop the car, and permit the door communicating with floor E to drop to  
 115 an open position. In ascending, roller 86 will strike and force cam 55 and the engaging end of lever 53 (at floor C) backwardly; but as the engaging end of said lever 53 has not been raised into engagement with latch 56 its backward movement will not affect said latch, and consequently the door at floor C will not be opened.

As the primary pull-bars are connected directly to each door-unlocking mechanism, but  
 125 one primary lever will be required for each floor; but as it is desirable to operate any one of said primary pull-bars from all the floors of the building the number of secondary pull-bars, bell-crank levers, and their con-  
 130



necting-rods will be multiplied in proportion to the number of floors in the building.

For convenience the secondary pull-bars may be numbered to correspond with the floors containing the primary pull-bars to which said secondary pull-bars are operatively connected, so that the operator need have no trouble in locating the proper pull-bar when it is desired to stop the car at a certain floor.

From the above description it is apparent that the doors leading into the main shaft are held closed while the car is in motion and remain closed until said car is brought to a standstill. Consequently the numerous accidents which daily occur from persons being struck by cars while in motion will be obviated.

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

1. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member slidably arranged upon said device, mechanism for holding said member in the path of the car, and means for releasing said member from the path of the car after the starting and stopping device has been moved a predetermined distance.

2. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member slidably arranged upon said device, mechanism for drawing and holding said member in the path of the car, and means for releasing and withdrawing said member from the path of the car after the starting and stopping device has been moved a predetermined distance.

3. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member arranged upon said device, a pull-bar for holding said member in the path of the car and means for releasing said member from the path of the car after the starting and stopping device has been moved a predetermined distance.

4. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member arranged upon said device, a pull-bar arranged to be drawn outwardly and pull said member into the path of the car, means for locking said pull-bar in its outward position, and means for retracting the pull-bar and the member after the starting and stopping device has been moved a predetermined distance.

5. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member arranged upon said device, a pull-bar arranged to be drawn outwardly and pull said member into

the path of the car, a shoulder on said pull-bar, a keeper which said shoulder engages when the pull-bar is drawn outwardly, a sliding bolt bearing against the pull-bar arranged in the path of the starting and stopping device, and means for retracting the pull-bar after the starting and stopping device has disengaged the shoulder from its keeper.

6. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping lever for operating said controller, a lug mounted upon said lever, a pull-bar arranged to be drawn outwardly and pull said lug into the path of the car, a device for holding the pull-bar outwardly, a sliding bolt bearing against the pull-bar and arranged in the path of the starting and stopping lever so that it will release said pull-bar when retracted by said lever, and means for locking the starting and stopping lever after it has retracted the sliding bolt.

7. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping lever for operating said controller, a member arranged upon said lever, mechanism for holding said member in the path of the car, means for releasing said member from the path of the car after the starting and stopping lever has moved a predetermined distance, a locking-lever for holding the starting and stopping lever after it has moved said predetermined distance, and means for disengaging said locking-lever from the starting and stopping lever.

8. In a mechanism of the character described, the combination with a controller, a shaft, a car arranged to travel in said shaft and a door for closing a doorway in said shaft, of a starting and stopping lever for operating said controller, a member arranged upon said lever, mechanism for holding said member in the path of the car, means for releasing said member from the path of the car after the starting and stopping lever has moved a predetermined distance, a locking-lever for holding the starting and stopping lever after it has moved said predetermined distance, a shoe arranged in the path of the door and operatively connected to the locking-lever so that it may disengage the latter from the starting and stopping lever.

9. The combination with a shaft, a car arranged to travel in said shaft, and a door for closing a doorway in said shaft, of a latch for normally holding the door in a closed position, a cam arranged in the path of the car, and means which may be interposed at will between the latch and cam so that said latch may be released from the door when the car operates the cam.

10. The combination with a shaft, a car arranged to travel in said shaft, and a door for closing a doorway in said shaft, of a latch for normally holding the door in a closed position,



a cam arranged in the path of the car, means which may be interposed at will between the latch and cam so that said latch may be released from the door when the car operates the cam, and a pull-bar for operating said means.

11. In a mechanism of the character described, the combination with a controller and a car, of a starting and stopping device for operating said controller, a member slidably arranged upon said device, a primary pull-bar suitably connected to said member for drawing and holding the same in the path of the

car, a secondary pull-bar suitably connected to said primary pull-bar, and means for releasing the sliding member from the path of the car after the starting and stopping device has been moved a predetermined distance.

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE W. WRIGHT.  
ALBERT LOVE.

Witnesses:

F. G. FISCHER,  
R. E. HAMILTON.