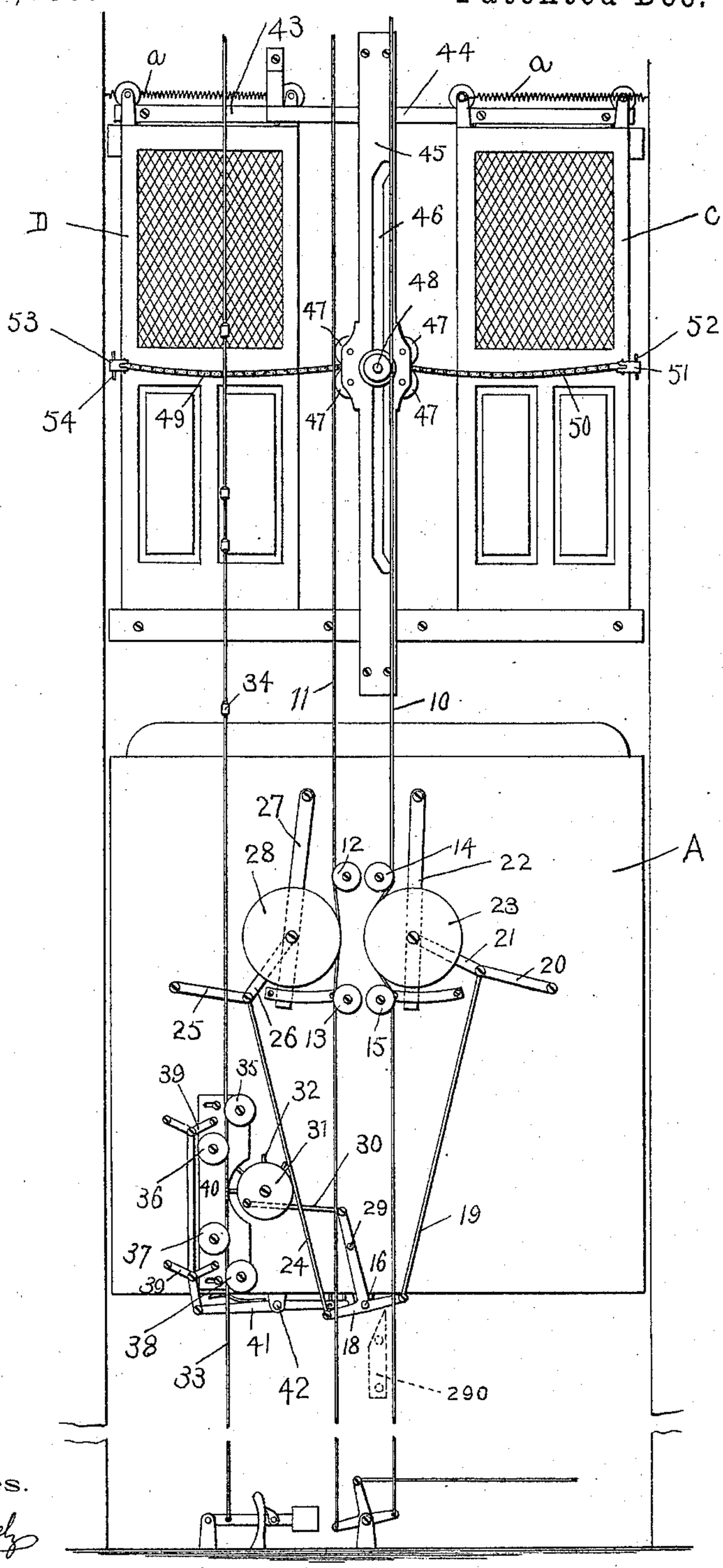
(No Model.) 3 Sheets—Sheet 1.

E. C. JENKINS.

ELEVATOR ATTACHMENT.

No. 572,997. Patented Dec. 15, 1896.



Witnesses.
Thos. F. Schmelz
E. M. Healy.

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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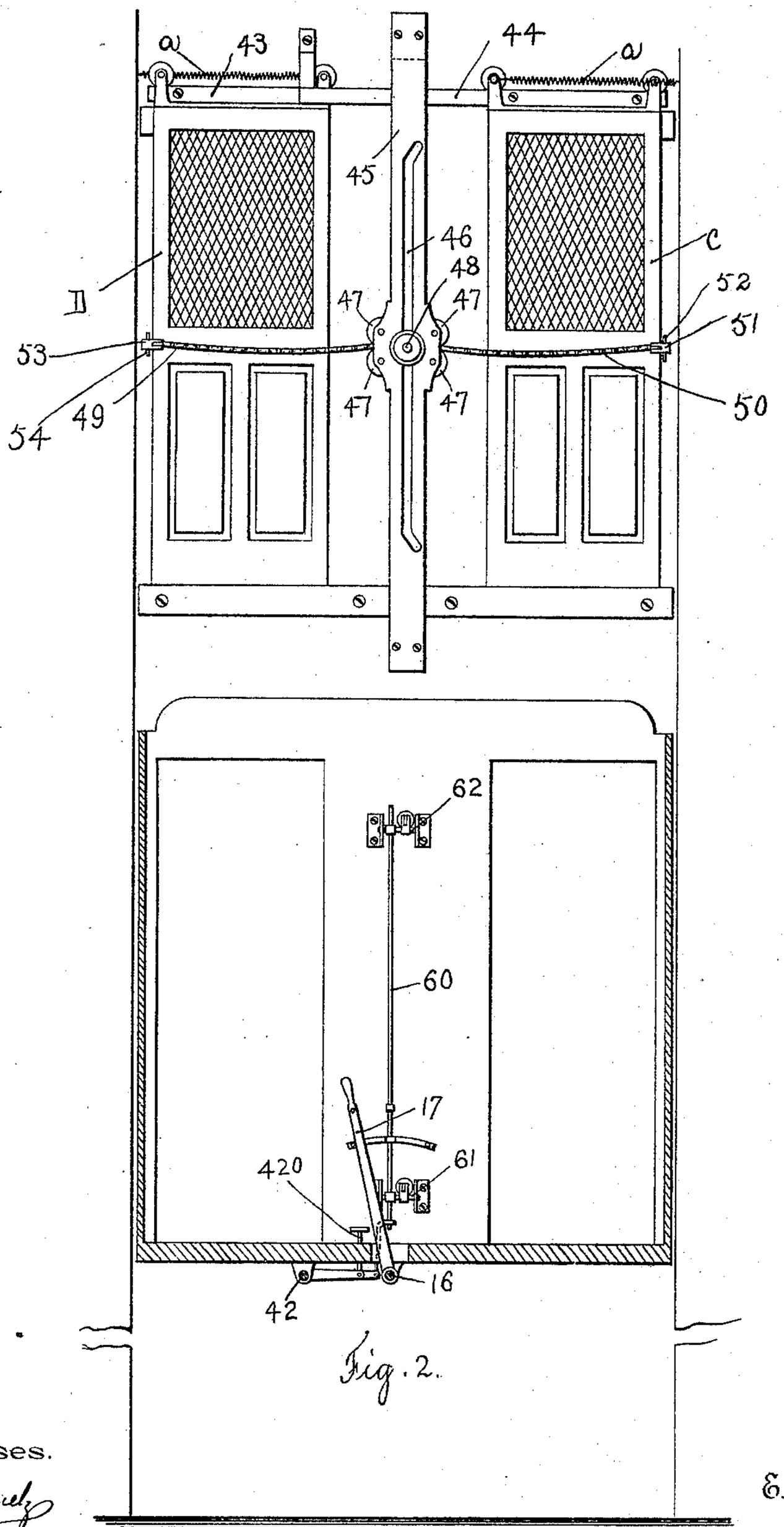

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

E. C. JENKINS.

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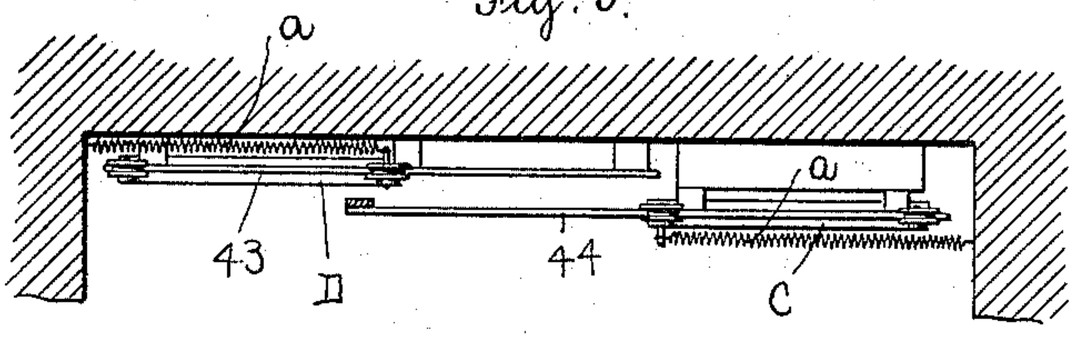
Fig. 3.



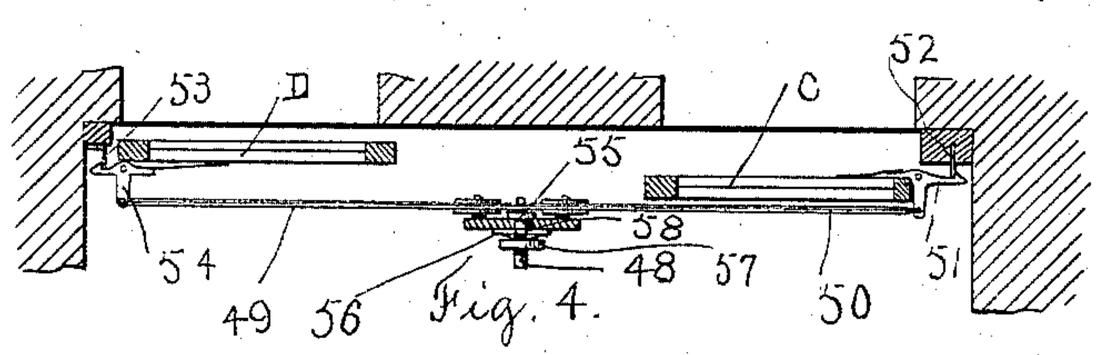


Fig. 4.

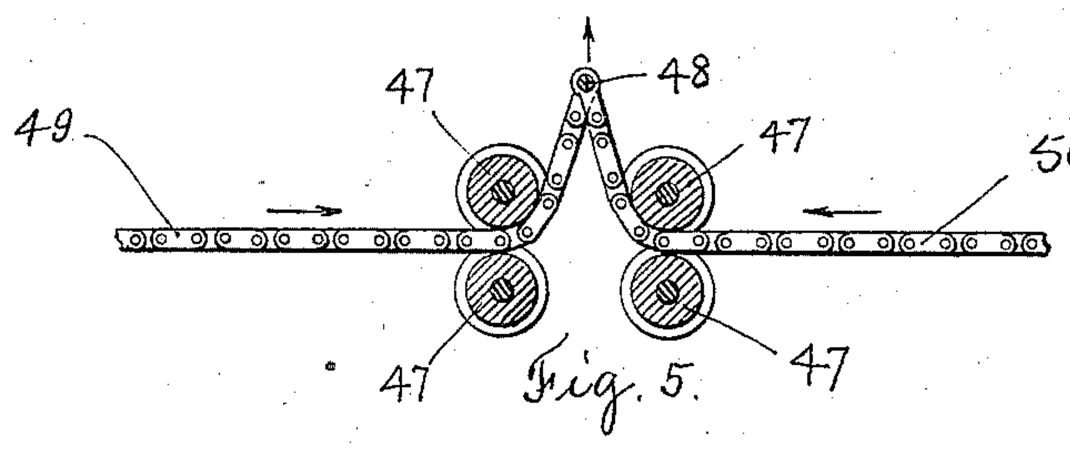
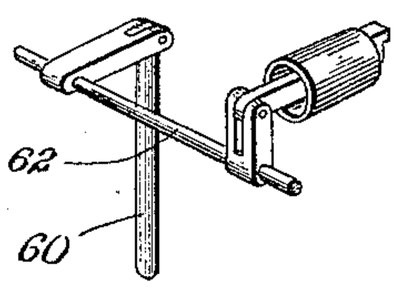


Fig. 5.

Fig. 7.



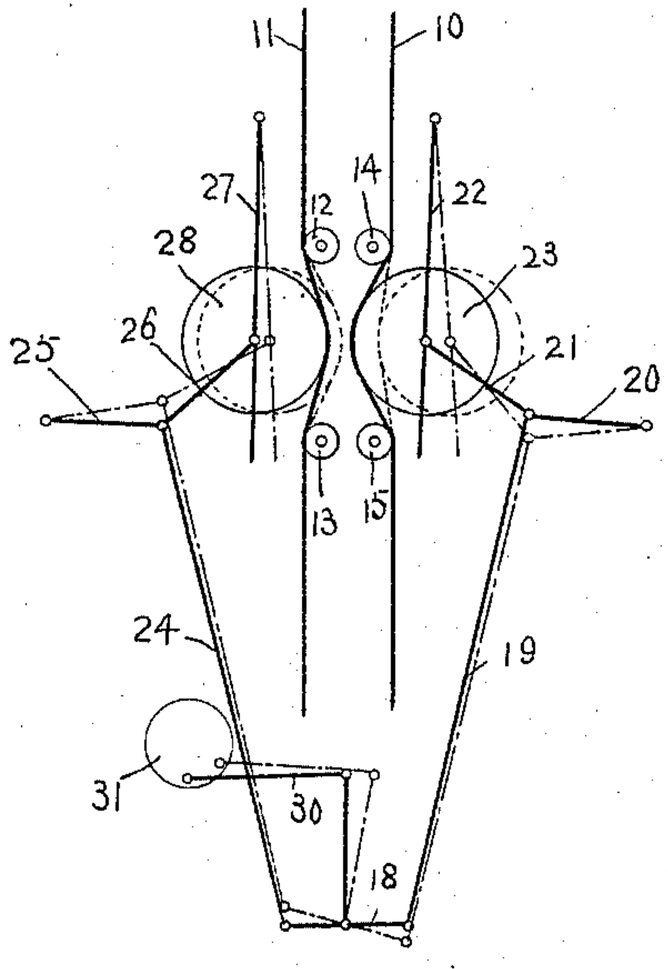
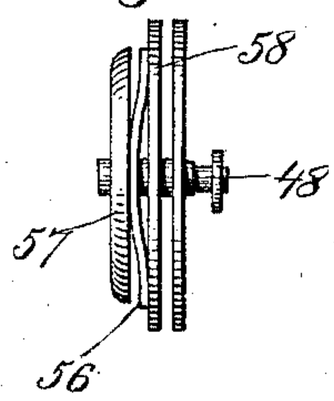


Fig. 6.

Fig. 8.



Witnesses.
Chas. F. Schmeltz
E. K. Healy.

Inventor.
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UNITED STATES PATENT OFFICE.

EBENEZER C. JENKINS, OF SHREWSBURY, MASSACHUSETTS.

ELEVATOR ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 572,997, dated December 15, 1896.

Application filed April 29, 1896. Serial No. 589,604. (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; and the especial object of my invention is to provide simple and efficient elevator-controlling devices and to combine said controlling devices with an automatic door-operating mechanism.

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 transverse sectional views illustrating the manner in which I preferably arrange the elevator-doors. Fig. 5 is a detail view of the flexible connections which I preferably employ for actuating the elevator-doors. Fig. 6 is a diagrammatic view illustrating the operation of my elevator-controlling devices. Fig. 7 is a detail view illustrating the connections for actuating one of the door-operating projections or plungers, and Fig. 8 is an enlarged detail view of the movable slide 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, an independent take-up device for each of said controlling ropes or cables, links arranged to move the take-up devices, and means for operating said links so that the amount drawn up on one rope will be equal to the amount let out on the other rope, thus keeping the controlling-ropes taut.

Referring to the drawings and in detail, A designates an elevator-car which is mounted on vertical ways in the ordinary manner.

Standing controlling ropes or cables 10 and 11 are mounted in the elevator-well in any of the ordinary manners 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 guide-pulleys 14 and 15. Journaled below the floor of the car is a rock-shaft 16, upon which is secured an operating-lever 17. Journaled upon the pivoted arms 22 and 27 are deflecting or take-up pulleys 23 and 28 for acting upon the controlling-ropes 10 and 11, respectively. Connected to actuate the pivoted arm 22 are the toggle levers or links 20 and 21. Connected to actuate the pivoted arm 27 are similar toggle levers or links 25 and 26. Fastened on the rear end of the rock-shaft 16 is a three-armed lever 18. The two lower arms of this lever 18 are connected by links 19 and 24 to operate the toggle-levers, so as to move the pivoted arms 22 and 27, respectively. By means of these connections the deflecting-pulleys or take-up devices for each of the controlling ropes or cables will be simultaneously operated, so that the amount drawn up on one controlling rope or cable will be equal to the amount let out upon the other controlling rope or cable.

The operation of this form of controlling device is most clearly illustrated by the diagrammatic view shown in Fig. 6. Referring to this figure, it will be seen that as the rock-shaft 16 is turned to the right the toggle levers or links 25 and 26 will be actuated to force the deflecting-pulley 28 into engagement with its controlling rope or cable 11, thus drawing upon or taking up on this rope. At the beginning of this movement the toggle levers or links 25 and 26 will stand at a considerable angle to each other, and during the first part of their movement they will produce a relatively large movement of their deflecting-pulley 28. As the toggle-levers 25 and 26 gradually straighten or move into line with each other the deflecting-pulley 28 will be moved more slowly. At the same time the deflecting-pulley 28, moving in toward its controlling rope or cable 11, will deflect or bend the rope 11 around its periphery, so that a relatively small motion of the deflecting-pulley 28 near the end of its travel will take up

the controlling-rope 11 more rapidly than at the beginning of its travel. The parts are thus so proportioned that the controlling-rope 11 will be drawn up at a substantially uniform speed when the rock-shaft 16 is turned to the right. In a similar manner the deflecting-pulley 23 will be operated to let out its controlling-rope 10 at a substantially uniform speed. At the beginning of the movement of the deflecting-pulley 23, the toggle levers or links 20 and 21 being then substantially in a straight line or at a comparatively small angle to each other, the deflecting-pulley 23 will be moved away from its controlling-rope 10 at a comparatively slow speed, but as the controlling-rope 10 is turned or wrapped around the deflecting-pulley 23 a comparatively small movement of said deflecting-pulley will release a greater amount of cable than when the deflecting-pulley is near the end of its travel to the right. As the deflecting-pulley 23 continues its travel the toggle levers or links 20 and 21 will operate to move the deflecting-pulley 23 more rapidly, the parts thus being so proportioned that the controlling rope or cable 10 will be let out at a substantially uniform speed. When the rock-shaft 16 is turned to the left, as illustrated in Fig. 6, the operation of the parts will be reversed, and the controlling rope or cable 10 will be taken up at a substantially uniform speed, while the controlling rope or cable 11 will be released or let out at the same speed.

It will thus be seen that I have provided a simple and efficient elevator-controlling device which is arranged to operate upon standing ropes or cables so that said cables will both be kept taut and so that said cables will be only slightly deflected from their vertical position, thus avoiding in a great measure the wear and friction which is ordinarily incident to the use of standing ropes or cables.

To stop the elevator-car at the end of its run, the three-armed lever, which is arranged upon the end of the rock-shaft 16, is provided with a projection or pin 29, which is arranged to engage the stationary cams 290, as indicated by dotted lines in Fig. 1, so as to shift the controlling device to its central position and to bring the car to rest when it reaches the end of its travel.

In connection with my improved elevator-controlling device I preferably provide means for automatically stopping the car opposite the desired landing.

As illustrated, the three-armed lever, secured upon the end of the rock-shaft 16, is connected to a pivoted disk 31 by means of a pitman or link 30. The pivoted disk 31 is provided with a plurality of forks or projections 32 for engaging stops or projections 34 upon a rope or cable 33. The rope or cable 33 passes between the guide-pulleys 35, 36, 37, and 38, which are journaled upon a slide 40. Toggle levers or links 39 for operating the slide 40 are connected to be actuated from an arm 41, extending from a rock-shaft 42, said rock-shaft being connected to be actuated by a foot-piece 420, as shown in Fig. 2. The cable or rope 33 is normally located so that the stops or projections 34 will not engage with or operate the pivoted disk 31. When the foot-piece 420 is depressed, the rope or cable 43 will be deflected, so as to bring the stops 34 into position to operate the pivoted disk 31 and to shift the controlling device, so as to bring the car to rest opposite the desired landing.

In connection with the means for automatically stopping the elevator-car I also preferably provide means for automatically and simultaneously opening an elevator-door.

As illustrated, I preferably provide two doors, as C and D, for each landing. These doors are preferably formed substantially one-third the width of the elevator-car and are arranged to slide past each other, so that substantially two-thirds of the side of the car may be used for the purpose of entrance and exit. As illustrated, the door D is mounted to slide on a way 43 and the door C is mounted to slide on a way 44, said ways being arranged out of line with each other, so that the doors C and D may open or slide past each other. The doors are normally held in their closed position by means of light springs, as *a*. A vertical guide, as 45, is mounted in the elevator-well between the doors C and D and is provided with a slot or way 46, having inclines or switch-sections near its ends. Mounted in the slot or way 46 is a slide or stud 48. The doors C and D are connected to the stud or slide 48 by means of chains or flexible connections 50 and 49, which pass between guide-pulleys 47, as most clearly illustrated in Fig. 5. At their outer ends the chains 49 and 50 are fastened to spring-catches 51 and 53, which are pivoted upon the elevator-doors, and are normally arranged to engage with lugs or projections 52 and 54 to positively secure and lock the elevator-doors.

For engaging and shifting the vertically-movable stud or slide 48 I provide the elevator-car with door-operating projections of substantially the same construction as shown in my prior patent, No. 541,616.

As illustrated, the foot-piece 420 is connected to actuate a vertically-movable rod 60. The vertically-movable rod 60 operates rock-shafts 61 and 62, which are provided with projecting arms connected to operate plungers or projections which may be pushed out from the front of the elevator-car in position to engage the projecting end of the stud or slide 48.

The rock-shaft 62 and its connections for operating one of the movable projections or plungers are illustrated on an enlarged scale in Fig. 7.

When the door-operating projections engage with and move the stud or slide 48 from its central position, the stud or slide 48 will draw or pull on the chains 49 and 50, so as to

first unlock the elevator-doors, and then open the same.

In practice I preferably provide means for creating a frictional resistance to the motion of the stud or slide 48, said frictional resistance being sufficient to substantially counterbalance the weight of the movable slide and the chains 49 and 50 when the stud or slide 48 is moved up from its central position, as illustrated in Fig. 5.

As shown, the stud or slide 48 is provided with a friction-washer 58 and with a collar or projection 57. Arranged between the projections 57 and the friction-washer 58 is a light spring 56, which is arranged to force the friction-washer 58 into engagement with the slotted guide 45 to create a frictional resistance to the motion of the slide or stud 48. This resistance is sufficient to prevent the stud or slide 48 from descending under the influence of gravity when the same is released while in a raised position, but is not sufficient to resist the action of the door-springs *a*. This construction will keep the chains taut between the elevator-doors and the movable slide or carriage, and will prevent the slide or carriage from moving down from an elevated position so rapidly as to allow the chains to kink or become tangled.

In some cases instead of employing two simultaneously-operating doors I may omit one of the doors and its flexible connection, and simply employ a single door at each landing in the ordinary manner.

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

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of controlling ropes or cables, a take-up device for each of said controlling ropes or cables, links arranged to move said take-up devices at different relative speeds, and means for simultaneously operating said links 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, a take-up device for each of said controlling ropes or cables, a pair of toggle levers or links connected to move each of said take-up devices, and means for simultaneously operating said toggle-levers 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, a pair of toggle levers or links connected to move each of said take-up devices, an operating-lever and rock-shaft, and connections from said rock-shaft to simultaneously operate said toggle-levers 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 take-up device for each of said controlling ropes or cables, a pair of toggle levers or links connected to move each of said take-up devices, a controlling-lever and rock-shaft, and links for connecting the toggle-levers with arms extending from the rock-shaft, substantially as described.

5. The combination of controlling ropes or cables, a pivoted arm, and a deflecting-pulley for each of said controlling ropes or cables, and links connected to simultaneously actuate said pivoted arms 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.

6. The combination of controlling ropes or cables, guide-pulleys mounted on the car, a pivoted arm and a deflecting-pulley for each of said controlling-ropes, a pair of toggle levers or links connected to move each of said pivoted arms, an operating-lever and rock-shaft, and links connecting the toggle-levers with arms extending from the rock-shaft, substantially as described.

7. The combination of controlling ropes or cables, a take-up device for each of said controlling ropes or cables, toggle levers or links connected to each of said take-up devices, and means for automatically operating said toggle levers or links to stop the car opposite the desired landing, substantially as described.

8. The combination of an elevator-car, a controlling mechanism carried by said car, a pivoted disk, a plurality of stopping devices, means for moving said stopping devices into position to operate the pivoted disk, and a pitman for connecting said controlling mechanism with the pivoted disk, substantially as described.

9. The combination of a door leading into an elevator-well, a vertically-movable slide, a flexible connection between the door and slide, means carried by the elevator-car for engaging with and moving the slide to automatically open the door, and means for causing a frictional resistance to the motion of the slide, substantially as and for the purpose set forth.

10. The combination of a door leading into an elevator-well, a vertical guideway, a slide mounted in said guideway, a flexible connection between the door and said slide, means carried by the elevator-car to engage with and actuate said slide to automatically open the door, and a washer and spring for causing a frictional resistance to the motion of the slide, substantially as described.

11. The combination of elevator-doors arranged in different vertical planes so as to slide past each other, a movable slide, a flexi-

ble connection from each of said doors, to the movable slide, and means for shifting the movable slide to simultaneously open said elevator-doors, substantially as described.

12. The combination of two elevator-doors arranged in different vertical planes so as to slide past each other, a movable slide, a flexible connection from each of said doors to the slide, and means carried by the elevator-car for actuating the slide to simultaneously open the elevator-doors, substantially as described.

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

EBENEZER C. JENKINS.

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