(No Model.) 3 Sheets—Sheet 1.

E. C. JENKINS.

ELEVATOR CONTROLLER.

No. 555,099. Patented Feb. 25, 1896.

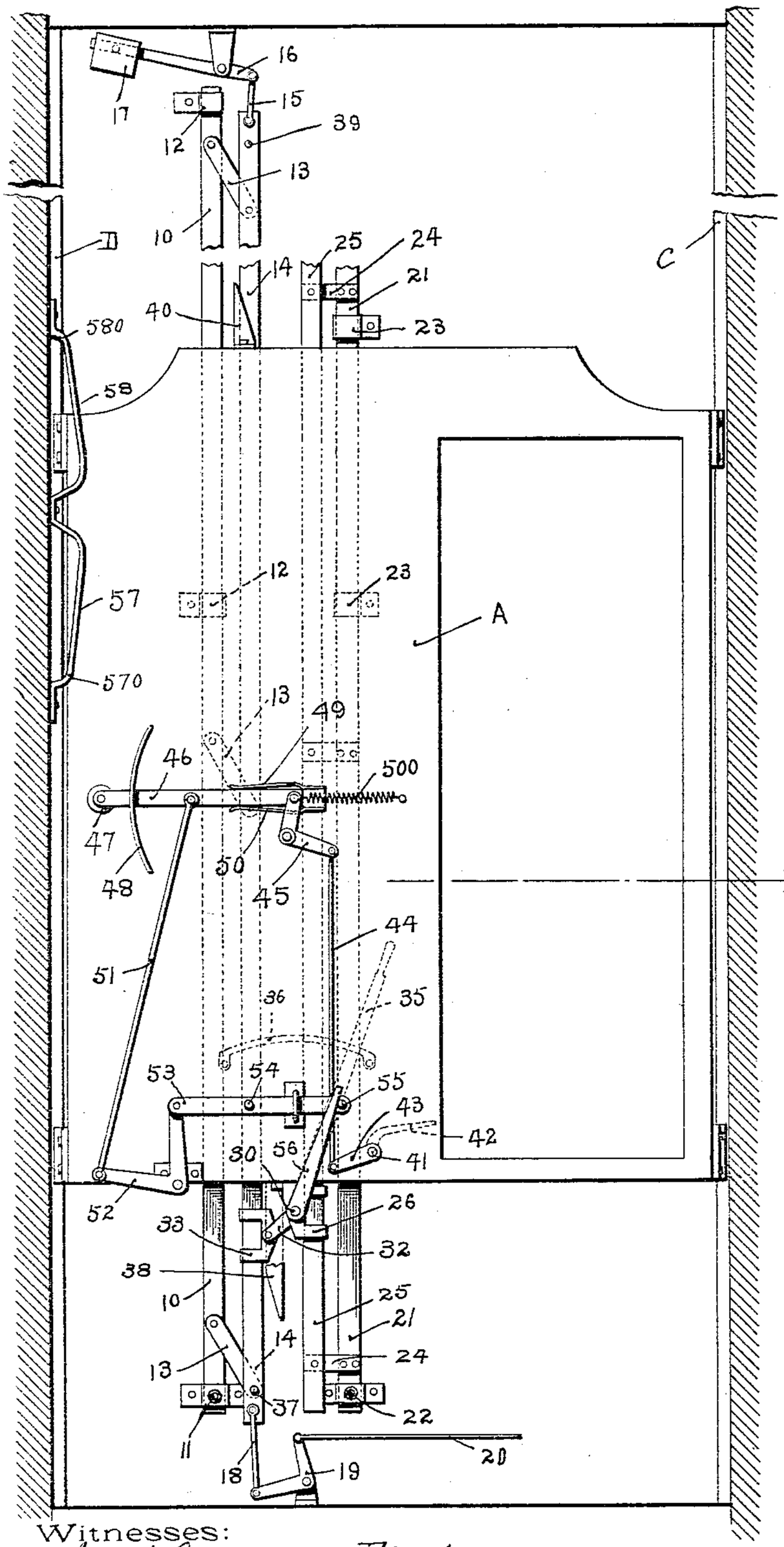

Fig. 1.

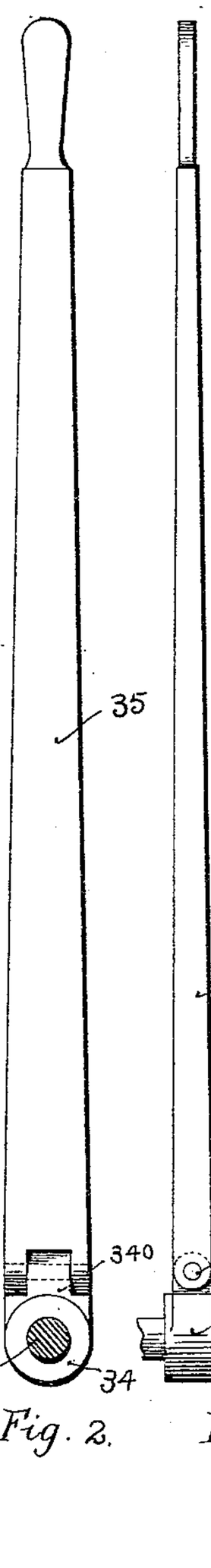

Fig. 2.

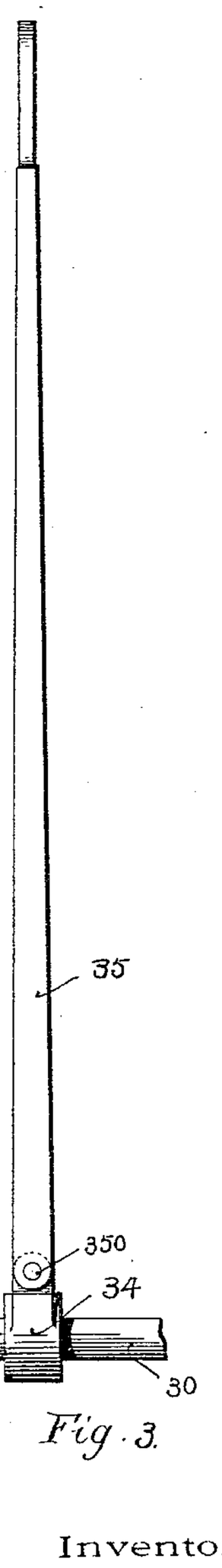

Fig. 3.

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(No Model.) 3 Sheets—Sheet 2.

E. C. JENKINS.

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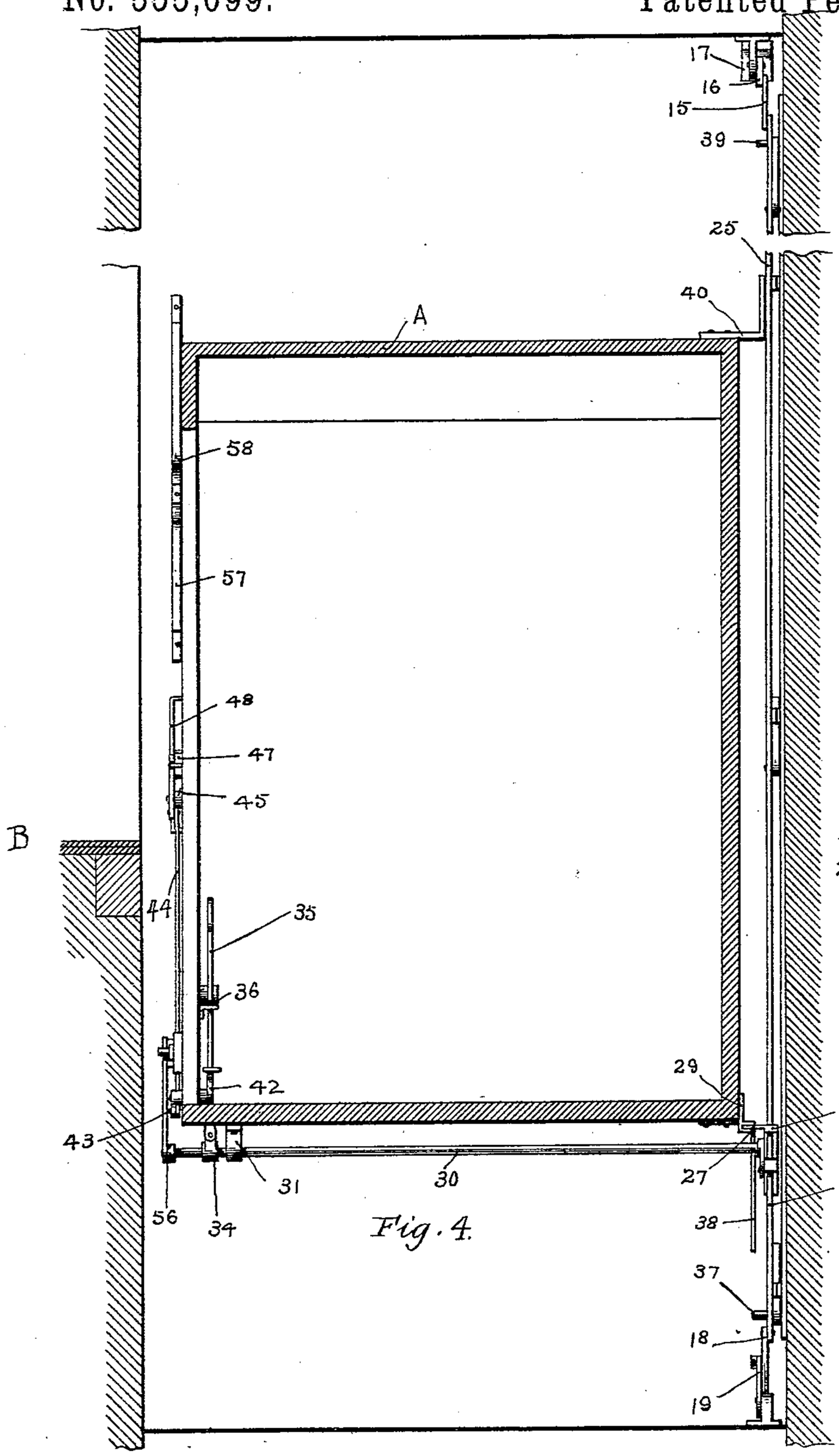

Fig. 4.

Fig. 5.

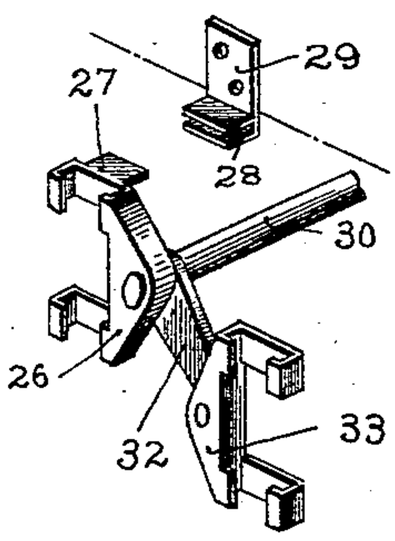

Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

E. C. JENKINS.

ELEVATOR CONTROLLER.

No. 555,099. Patented Feb. 25, 1896.

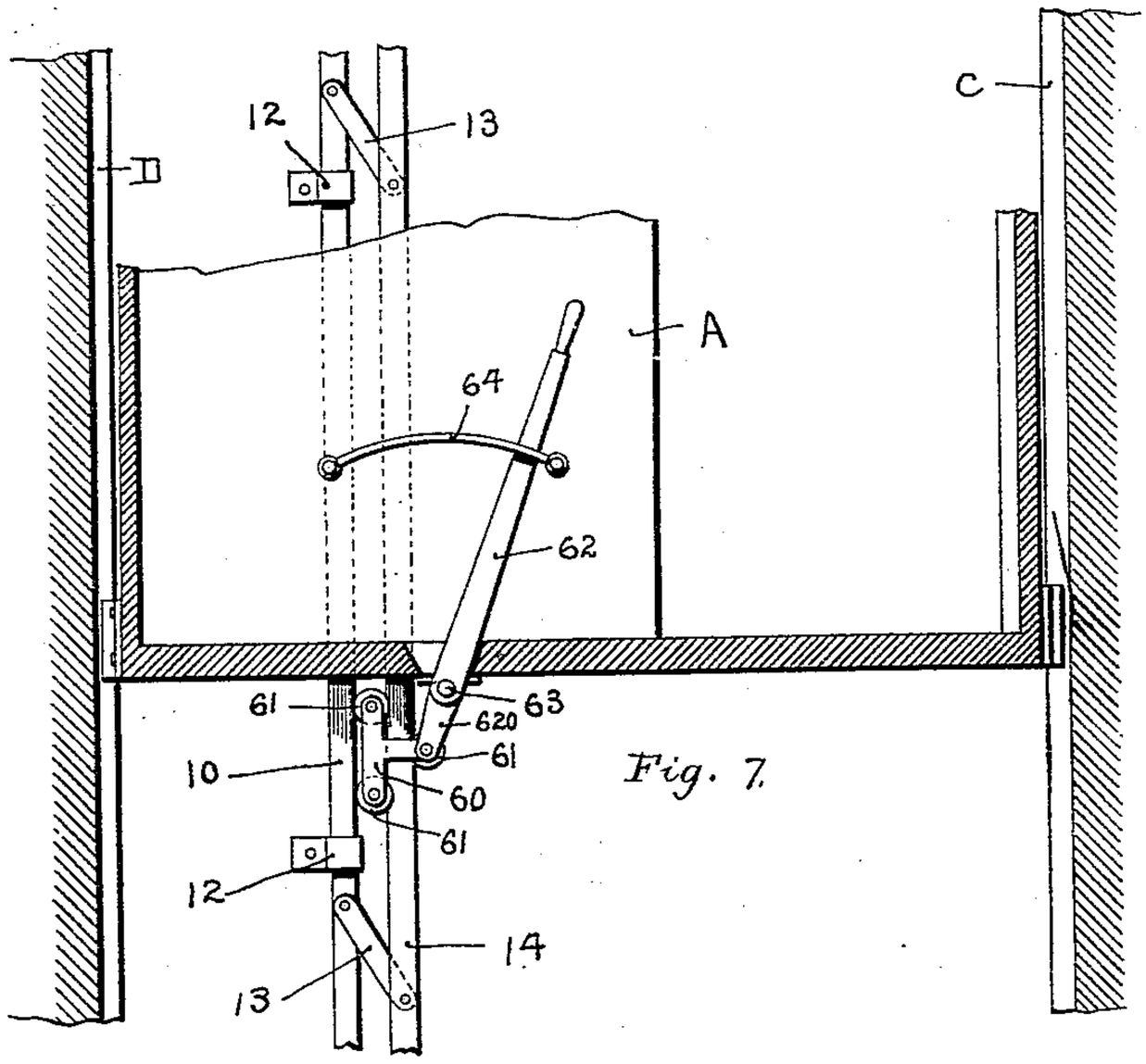

Fig. 7.

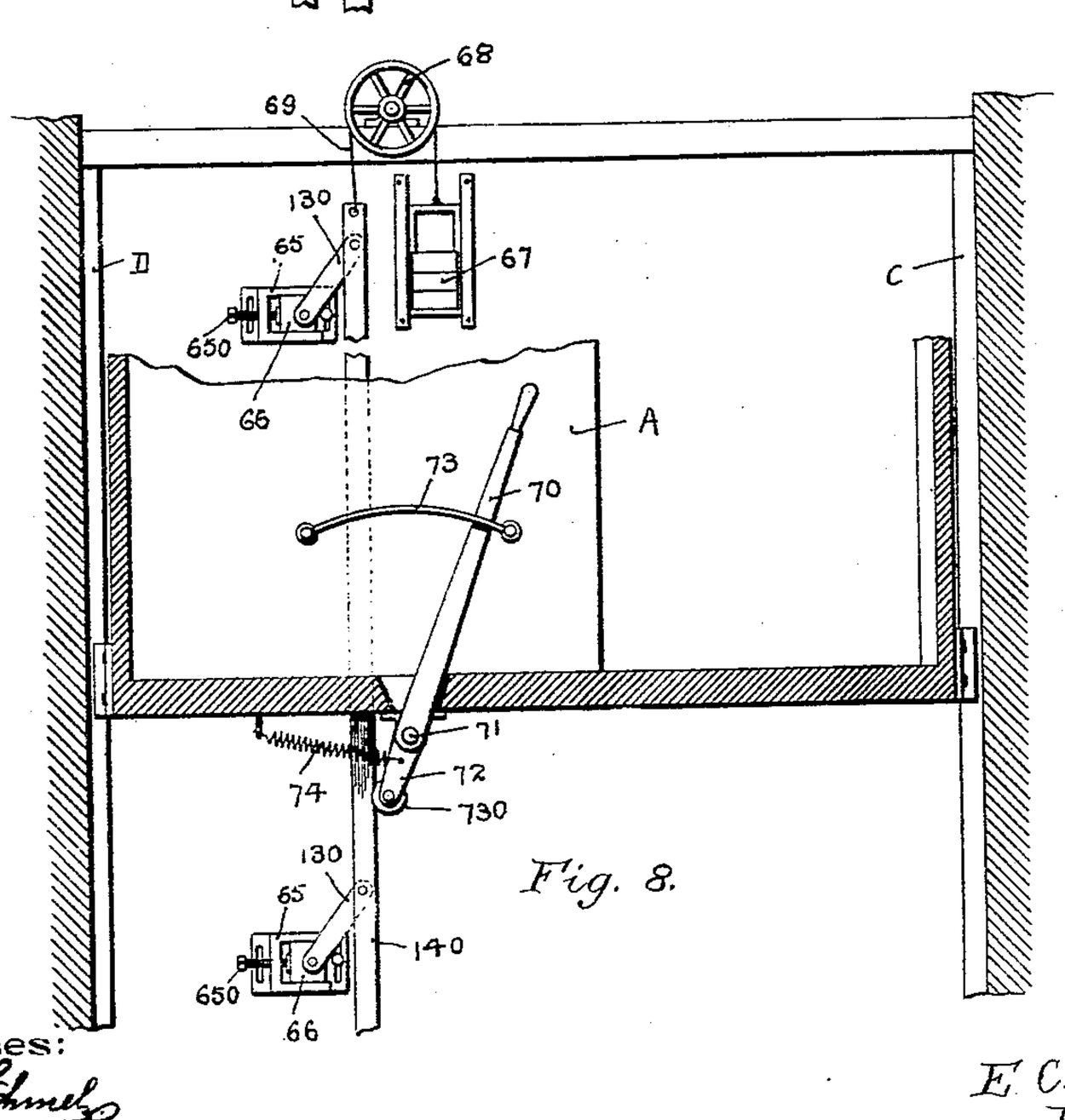

Fig. 8.

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UNITED STATES PATENT OFFICE.

EBENEZER C. JENKINS, OF SHREWSBURY, MASSACHUSETTS.

ELEVATOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 555,099, dated February 25, 1896.

Application filed April 8, 1895. Serial No. 544,945. (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-Controllers, of which the following is a specification.

My invention relates to an improved form of elevator-controller; and the especial object of my invention is to provide a strong, simple and durable form of elevator-controller in which the parts are so mounted that they will not be affected by the lost motion between the elevator-car and its ways, and are secured so that they will not be affected by the expansion and contraction due to changes in temperature.

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 side elevation of an elevator-car, showing my improved controlling device applied thereto. Figs. 2 and 3 are detail views showing the adjustable connection between the controlling-lever and the transverse shaft, which I preferably employ. Fig. 4 is a sectional view of the elevator-car. Figs. 5 and 6 are detail views to be hereinafter referred to, and Figs. 7 and 8 are sectional views showing modified forms of construction.

An elevator-controller constructed according to my present invention comprises a movable bar which extends substantially the length of the elevator-well, and devices which are mounted upon the car for shifting said movable bar.

Referring to the drawings and in detail, A designates an elevator-car which is guided upon vertical ways C and D, and which may be moved up and down by any of the ordinary connections not necessary to herein show or describe at length. Mounted on the rear wall of the elevator-well I provide a stationary strip or bar 10. In practice I preferably secure or anchor the lower end of the strip 10 in place by means of a suitable bolt, as 11, and at suitable intervals I provide a number of clamps 12, which engage with but are not rigidly secured to the bar 10. By means of this construction it will be seen that the lower end of the strip 10 will be anchored or secured rigidly in place, and that the strip is mounted so that it may expand or contract freely for the various changes in temperature.

Supported by and connected to the strip 10 by means of parallel links 13 is a movable strip 14. At its lower end the movable strip 14 is connected by a link 18 with a bell-crank lever 19, which may be connected by a rod 20 with the valve, switch or other starting and stopping device for the elevator. At its upper end the movable strip 14 is connected by a link 15 to a lever 16 having an adjustable counterweight 17 secured near its opposite end, as shown.

Secured on the rear wall of the elevator-well, parallel with the strip 10, I provide a strip 21, which is anchored or secured at its lower end by a bolt 22, and is held in place at suitable intervals by clamps 23, which will allow said bar to freely expand or contract. Mounted upon and connected to the rod 21 by means of offset braces 24 I provide a guide-strip 25. Engaging with the guide-strip 25, and arranged to move vertically thereon, I provide a shoe or traveler 26.

Referring to Figs. 5 and 6 it will be seen that the shoe or traveler 26 is provided with a laterally-extending projection or tongue 27, which fits into and engages a slot 28 formed in a bracket 29, which is fastened upon and secured to the car. By means of this construction it will be seen that the shoe or traveler 26 will move up and down upon its guide 25 with the elevator-car and that the projection 27 and the slot 28 will provide an adjustable connection which will compensate for any lateral movement of the elevator-car due to the lost motion between the car and its guides.

Journaled at one of its ends in the shoe or traveler 26 and supported by a bracket 31 extending down from the car I provide a transverse rock-shaft 30. The rock-shaft 30 is provided near the shoe or traveler 26 with a crank-arm 32, which is pivoted to and actuates a traveler 33, which is movably mounted upon the bar or strip 14. By means of this construction it will be seen that when the rock-shaft 30 is turned the bar 14 will be shifted by means of the crank-arm 32, and the trav-

eler 33 and the elevator stopping and starting device may be operated. Also, it is to be noted that as the bearings of the rock-shaft 30 in the bracket 31 and the traveler 26 are separated by a considerable distance the elevator-car may have a considerable lost motion upon its ways without affecting the relation of these parts.

A controlling-lever 35 for actuating the rock-shaft 30 extends up through the bottom of the car in a position to be conveniently operated and co-operates with a stationary frame or sector 36. This controlling-lever may be rigidly fixed upon the rock-shaft 30 or it may be splined thereon; but in practice I preferably provide a pivoted connection between the controlling-lever 35 and the rock-shaft 30, whereby the elevator-car may slip upon or move longitudinally with respect to the shaft 30, without materially affecting the relation of these parts. The details of this joint are most clearly illustrated in Figs. 2 and 3. Referring to these figures, 34 designates a collar rigidly secured upon said shaft 30. Extending up from the collar 34 is a tongue 340, which may be pivoted to the controlling-lever 35 by means of a pin 350, as shown. By providing a loose connection between the controlling-lever and the rock-shaft and by providing a slip-joint between the car and the traveler 26 it will be seen that said traveler will move freely on its guide-strip 25 and that the car may have a considerable amount of play or lateral movement without cramping the traveler or causing the same to bind upon its way.

In order to stop the elevator-car at the top and bottom of the run, I may provide automatic stopping devices.

In practice I preferably provide an automatic stop for shifting the bar 14 to its central position when the elevator-car is at each end of its run, thus automatically bringing the car to rest. For this purpose the elevator-car is provided with a downwardly-extending cam 38, and at its top is provided with an upwardly-extending cam 40. The cam 38 is located in position to engage with a pin 37 extending from the strip 14 when said strip 14 has been shifted into position to cause the downward travel of the car, and the cam 40 is located in position to engage a pin 39 on the strip 14 when said strip 14 has been shifted into position to cause the upward travel of the car.

In connection with the controlling devices thus far described, I preferably employ foot-controlled connections for stopping the car opposite any of the desired landings. These connections are most clearly illustrated in Fig. 1. Referring to this figure, 41 designates a rock-shaft having on its inner end a foot-piece 42, and carrying at its outer end a crank-arm 43, connected by a rod 44 to actuate a bell-crank lever 45, pivoted to a movable piece 46, which is guided in a suitable frame 48, and carries a friction-roller 47 at its outer end. The movable piece 46 is normally held in a horizontal position by flat springs 49 and 50, which engage upon opposite sides thereof, as shown, and is normally retracted or drawn back by means of a retractile spring 500.

When the foot-controlled connections, as above described, are operated, the movable piece 46 will be pushed out against the tension of the spring 500 until the friction-roller is brought into position to engage with the stationary cam 57 when the car is on its upward travel, or with the stationary cam 58 when the car is on its downward travel.

The movable piece 46 is connected by a rod 51 with a bell-crank lever 52, which is pivoted to a sliding bar 53, having projecting pins or stops 54 and 55, which are located to engage upon opposite sides of a lever 56, fastened upon the rock-shaft 30.

When the movable piece 46 is shifted from its horizontal position by engaging with one of the stationary cams 57 or 58, it will actuate the bell-crank lever 52 through the rod 51, and will move the sliding bar 53 so that one of its pins will engage the lever 56, and will move it into a central position, thus bringing the car to rest opposite the desired landing. The central position of the lever 56 is substantially opposite the staple or bearing which supports the sliding bar 53.

The cams 57 and 58 are preferably provided with shoulders 570 and 580, which engage with the roller 47, to throw the movable piece 46 from its central position, and through the connections described to partially close the valve. The inclined portions of the cams will thereafter act to complete the closing of the valve and to stop the car opposite the desired landing.

In some cases I contemplate dispensing with the strip 21 and the guide-strip 25, and providing a direct connection between the operating-lever and the movable strip 14. I have illustrated such a construction in Fig. 7. Referring to this figure, 10 designates the strip which is mounted in the elevator-well, and is connected to the movable strip 14 by the links 13, as hereinbefore described. A shoe or traveler 60 is mounted upon the strip 14, and in practice I preferably provide the traveler 60 with grooved friction-wheels 61 for holding the same in place, as shown. The traveler 60 is pivoted to and connected to a crank-arm 620, extending down from a rock-shaft 63 journaled in the car, and having a controlling-lever 62 secured thereto. The controlling-lever may co-operate with and be guided by a stationary sector 64, as shown.

In some cases also I contemplate providing means for engaging with and actuating the movable strip in one direction only, the strip being moved in an opposite direction by gravity or by spring-tension, and I have illustrated such a construction in Fig. 8. Referring to this figure, 65 designates suitable brackets or bearings which are mounted in the elevator-well, and which may be adjusted ver-

tically by means of slots which engage with the securing-bolts. Adjustably mounted in the brackets 65 are blocks 66, which may be secured in their adjusted positions by screws 650, as shown. The adjustable blocks 66 are connected with a movable strip 140 by means of links 130. By means of this construction the block 66 can be adjusted to secure the movable rod 140 accurately in place and to compensate for any expansion thereof due to changes in temperature. At its upper end the movable strip 140 is connected to an adjustable counterweight 67 by means of a cord 69, which passes over a pulley or sheave 68. The counterweight 67 is of less weight than the movable strip 140, and said strip will have a normal tendency to move down and laterally with respect to the blocks 66. Engaging with and bearing upon the opposite edge of the movable strip 140 I provide a friction-wheel 730, carried by a crank-arm 72, extending down from a rock-shaft 71. The rock-shaft 71 is provided with a controlling-lever 70, which co-operates with a frame or sector 73, as shown, and in practice I preferably provide a coiled spring 74 to counteract the normal tendency of the movable strip 140. In this construction it will be seen that the controlling device engages with and actuates the movable strip in one direction only, said strip moving in the opposite direction by gravity.

I am aware that changes may be made in the construction of my controlling device by those who are skilled in the art, and I do not wish therefore to be limited to the exact construction which I have shown and described; but

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

1. In an elevator-controller, the combination of a fixed support, a movable strip or bar, a plurality of parallel links, each of said links being pivoted near one of its ends to said strip or bar, and near its opposite end to said fixed support, and devices carried by the car for actuating said movable strip, substantially as described.

2. In an elevator-controller, the combination of a movable strip or bar, stationary supports mounted in the elevator-well, a plurality of parallel links, each of said links being pivoted near one end to the movable strip or bar, and near its other end to a stationary support, and devices carried by the car for actuating said movable strip, substantially as described.

3. In an elevator-controller, the combination of a movable strip or bar, a stationary supporting-strip mounted in the elevator-well, means for rigidly securing the lower end of said stationary strip, a plurality of clamping devices for holding said strip in place while allowing said strip to expand or contract for changes in temperature, a plurality of parallel links, each of said links being pivoted near one of its ends to the movable strip or bar, and near its other end to the supporting strip or bar, and devices carried by the car for actuating said movable strip, substantially as described.

4. In an elevator-controller, the combination of a movable strip or bar, a shoe or traveler mounted on said strip or bar, a loose connection for causing said shoe or traveler to move up and down with the elevator-car while compensating for lost motion between the elevator-car and its ways, and means carried by the elevator-car for actuating said shoe or traveler, substantially as described.

5. The combination of an elevator-car, a movable strip or bar, a supporting-strip, a plurality of parallel links pivoted to said movable bar and to said supporting-strip, a shoe or traveler mounted on said supporting-strip, said shoe or traveler being connected to move with the elevator-car by means of a tongue or projection engaging with a slot, and means mounted in the car for actuating the movable strip, substantially as described.

6. The combination of an elevator-car, a movable strip or bar, a supporting-strip, parallel links or levers pivoted to said movable strip and said supporting-strip, a shoe or traveler mounted on said supporting-strip, a rock-shaft journaled in said shoe or traveler, and connected to actuate the movable strip, and a controlling-lever extending to the interior of the car, said controlling-lever being loosely connected to the rock-shaft, substantially as described.

7. The combination of an elevator-car, a movable strip or bar, a supporting-strip, parallel links or levers pivoted to said movable strip and to said supporting-strip, a shoe or traveler mounted on said supporting-strip, said shoe or traveler being connected to move with the elevator-car by means of a tongue or projection engaging with a slot or groove, a rock-shaft journaled in said shoe or traveler, and connected to actuate the movable strip, and a controlling-lever extending to the interior of the car, said controlling-lever having a loose connection with said rock-shaft, substantially as described.

8. The combination of a movable strip or bar connected to control the movements of an elevator-car, stationary cams, foot-controlled connections for shifting the movable piece into position to engage said stationary cams, and connections between said movable piece for actuating said movable strip or bar, substantially as described.

9. The combination of a movable strip or bar connected to control the movement of an elevator-car, a movable piece, stationary cams, foot-controlled connections for shifting said movable piece into position to engage with said stationary cams, and a slidable bar actuated by said movable piece for shifting said movable strip or bar, substantially as described.

10. The combination of a movable strip or bar connected to control the movement of an

elevator-car, a rock-shaft and actuating devices for shifting said movable strip or bar, stationary cams, a lever extending from said rock-shaft, a movable piece mounted in the elevator-car, foot-controlled connections for shifting the movable piece into position to engage with said stationary cams, and a slidable bar actuated from said movable piece, said slidable bar having pins or projections to engage with said lever, 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.