No. 698,738. Patented Apr. 29, 1902.

# A. B. RONEY.

## ELEVATOR.

(Application filed Oct. 10, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 7.

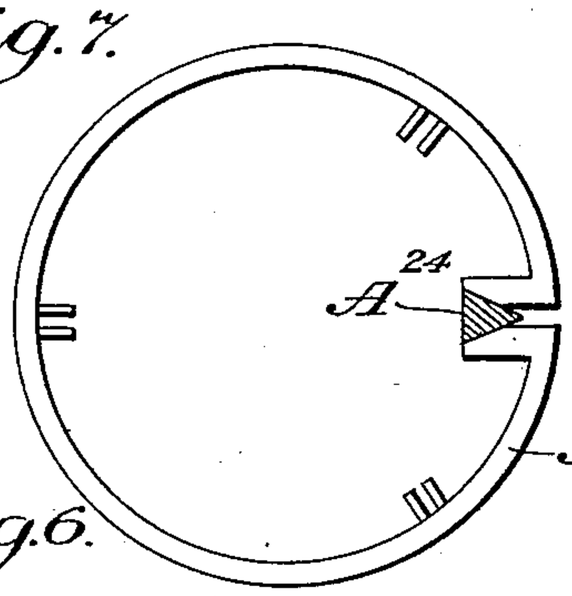



Fig. 6.

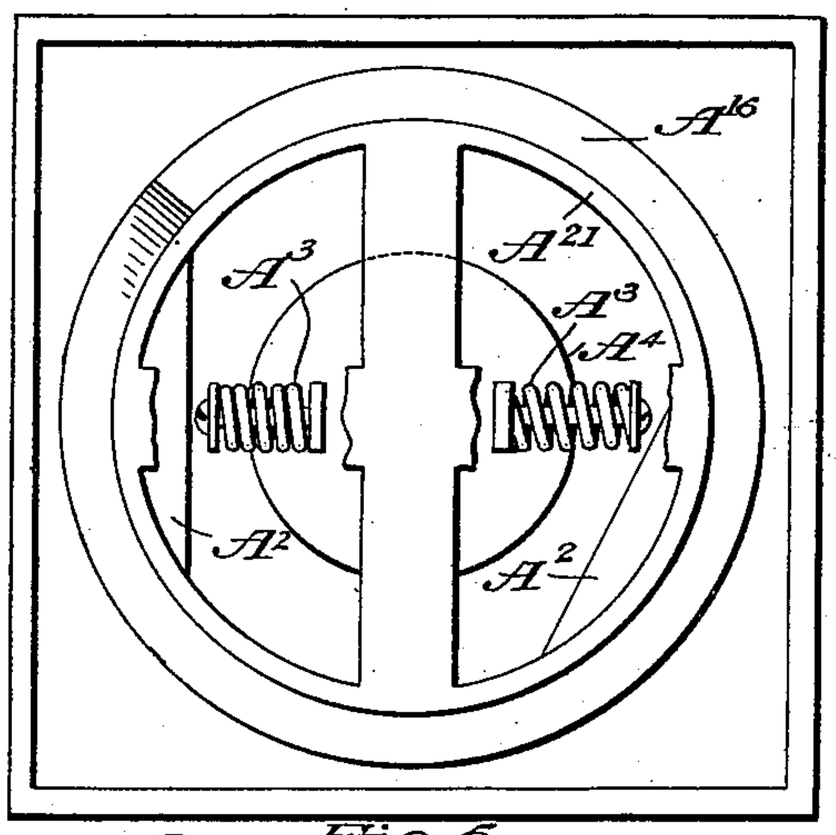



Fig. 5.

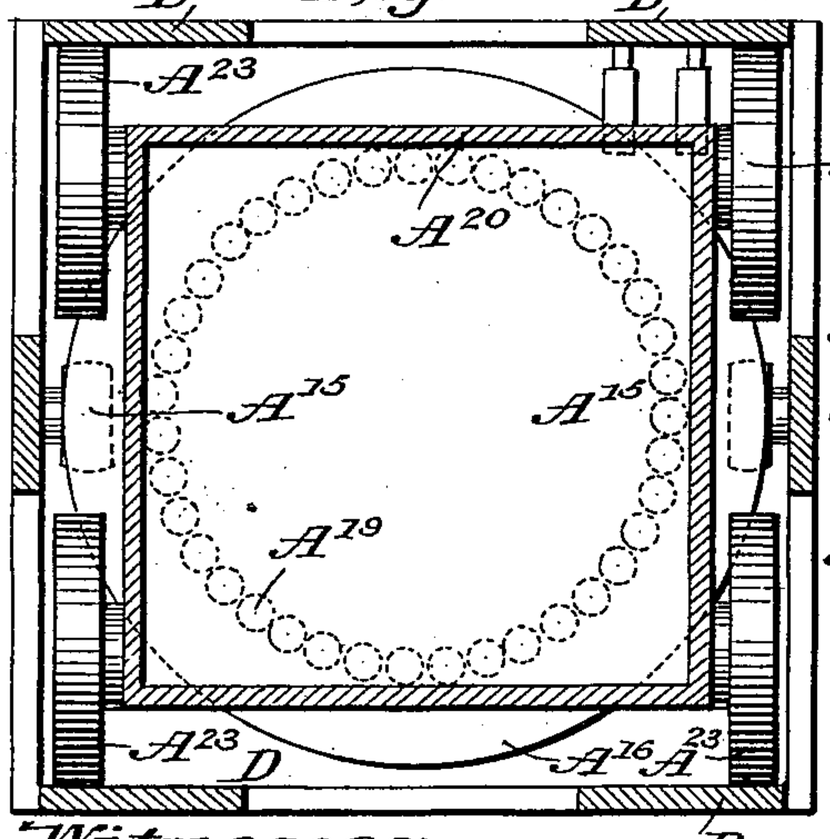
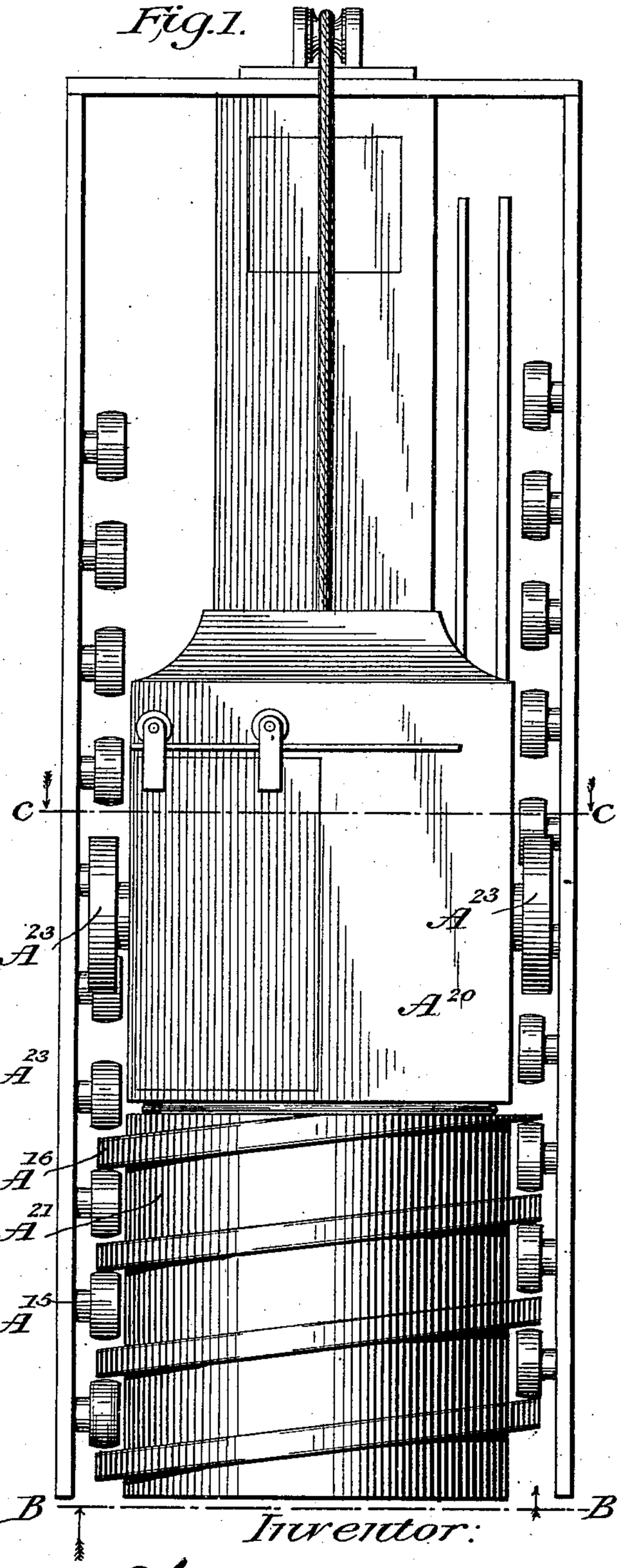



Fig. 1.




Witnesses:
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George W. Gross

Inventor:
Alexander B Roney

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## ELEVATOR.

(Application filed Oct. 10, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

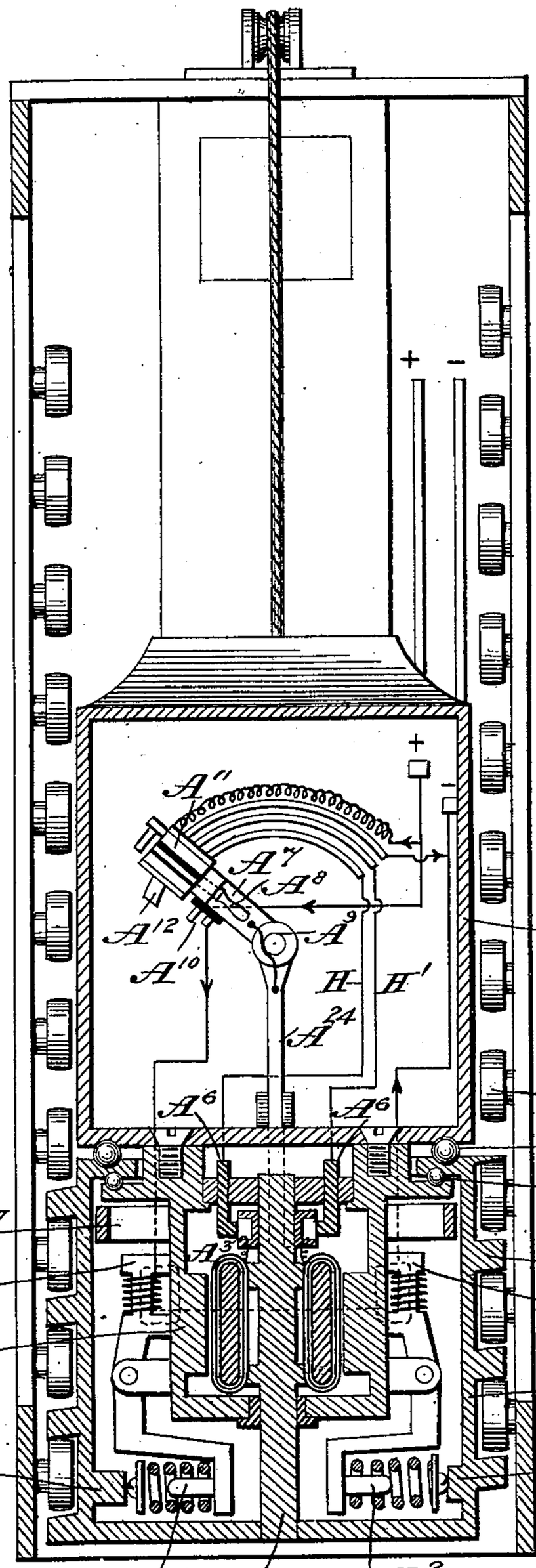


Fig. 3.

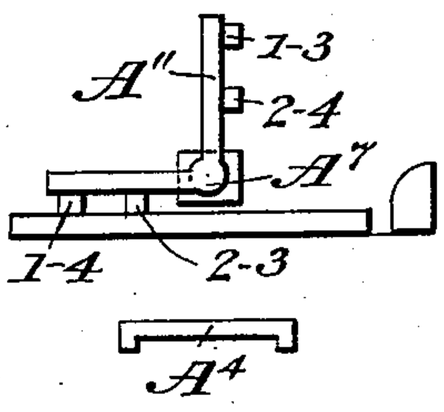


Fig. 4.


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# UNITED STATES PATENT OFFICE.

ALEXANDER B. RONEY, OF CHICAGO, ILLINOIS.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 698,738, dated April 29, 1902.

Application filed October 10, 1901. Serial No. 78,183. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER B. RONEY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Elevators, of which the following is a specification.

The object of my invention is absolute safety, variable speed, economy of space, and power.

Figure 1 is an outline view of the elevator. Fig. 2 is a vertical section of Fig. 1. Fig. 3 is a detail end view of the switch and its contact-strips. Fig. 4 is a section of a part of the racks indicated by $A^{15}$ in Fig. 1. Fig. 5 is a cross-section of Fig. 1 on the line C C. Fig. 6 is a view of Fig. 1 on the line B B. Fig. 7 is a detail view of the split brake-ring, and the part $A^{24}$ is a section of the hand brake-lever.

This elevator comprises a car $A^{20}$, adapted to travel between guides D D D D, fixed in an elevator-shaftway, and has thrust-rollers $A^{23}$ $A^{23}$ $A^{23}$ $A^{23}$ attached to its sides in rolling contact with the guides to prevent it turning around. The car rests on antifriction-balls $A^{19}$, retained in a ball-race cut in the head of circular drum $A^{21}$. The drum $A^{21}$ combines a screw or worm $A^{16}$, in mesh with the racks that reach up on the opposite walls the full length of shaftway. Within the screw-drum $A^{21}$ is an electric motor having its field-magnet $A^4$ suspended from the floor of the car, while its armature is directly connected to the drum, the screw of which meshes in the racks.

The mechanism of the racks is distinguished by a double series of studs $A^{15}$, diametrically opposite, equally spaced apart, with one end attached to the walls of the shaftway and the other ends projecting, with rollers loose thereon.

Within the drum $A^{21}$ are levers pivoted so as to have their ends free, and fast to one end of said levers are the horseshoe-magnets A′ A′, that are adapted to contact with the stationed armature or iron field-magnet of the motor $A^4$, and the other ends of said levers present cushioned shoes $A^3$ $A^3$ for compression by the cam-shoes projecting in from the drum. The spring-cushion under the brake-shoes $A^3$ $A^3$ is a preferred but not an essential feature of the brake construction.

The motor is series-wound and constructed in the usual manner, with ring armature spidered to its shaft, its coils wired to the commutator, the commutator wired to the controller, and the controller wired to the line-circuit. One end of the motor's field-magnet is shaped so that it can be bolted to the bottom of the car and flares out into a flange reaching under the shoulder projecting in from the head of the screw-drum, and between the shoulder and flange is a groove filled with antifriction-balls $A^{18}$, that are subject to the action of the overcounterweighted car, not merely as a safety-catch as much as a reducing factor in the amount of motive power saved by balancing the variable loads up to an average.

Now that part $A^{11}$ of the controller-switch handle $A^8$ extended over the contact-rails 1 2 3 4 has angular sides, (see Fig. 3,) and to the respective sides pairs of metal strips are attached, and the contact ends $A^{14}$ of the strips stand out and span the intervening rails, so that rails 1 and 3 and 2 and 4 are in circuit when the ends of the strips 1 3 and 2 4 register in contact with them. The other angle side of the switch also has a pair of metal strips 1 4 and 2 3, with contact ends that stand out and adapted to contact with rails 1 and 4 and 2 and 3 when the switch-handle is turned to close the circuit through the motor in the one direction, then to open circuit, and then to close it in the reverse direction.

The switch is journaled in the end of link $A^7$, and the other end of the link is hinged to one end of the hand brake-lever $A^{24}$, which is pivoted to the car, and the other end of the lever $A^{24}$ is adapted to spread the split ring $A^{17}$ (see Figs. 2 and 7) into frictional contact with the drum.

Operating the elevator, the operator turns the switch-handle $A^8$ to swivel the switch $A^{11}$ onto the rails 1, 2, 3, and 4 to close the circuit through the motor. Then the switch has circuited rails 1 and 4 through its metal strips 1 4 in the positive and rails 2 and 3 through its metal strips 2 3 in the negative directions. Then the operator, still holding the switch down on the rails, now pulls the switch, and

the link $A^7$, in which the switch is journaled, swings with the switch while guiding it over the rails in regulating the flow of current through the motor. Now the motor is revolving the drum, which with its screw meshed in the racks screws itself up the shaftway to the floor desired. Now the operator lets go of the switch-handle $A^8$, and the tension of the spring $A^9$, situated at the hinge, automatically throws the link and switch back over the rails until it strikes the bumper $A^{12}$ and swivels the switch out of contact with the rails, thus opening the motor-circuit and at the same time by means of the metal strip $A^{10}$, attached to the side of link $A^7$, closes the brake-circuit through the horseshoe-magnets A′ A′, thus generating magnetic lines of force therein that attract the magnet ends of the pivoted levers down in contact with the stationed iron part of the motor, and at the same time the other end of said levers with brake-shoes spring-cushioned are thrown out against the cam-shoes $A^2$ $A^2$, projecting in from the drum, thus arresting the momentum of the drum until it stops. This brake action is positive in spite of the effort of the drum's momentum to brake the tractive hold of the magnets and insures a kind of brake action that gives a smooth floor-stop without shock. The operator again manipulates the switch, as in the first instance, to elevate the car still higher. In doing so the brake-circuit is opened and the motor-circuit closed. The motor now revolves the drum, and its cam-shoes $A^2$ $A^2$ move by without touching the cushioned shoes $A^3$ $A^3$ until the motor-circuit is opened and the brake-circuit closed. Then they engage the cushioned shoes for the brake action, as before. Now this power-brake may or may not be required to stop the car in its descent, because the pitch of the drum-screw can be so steep that the car will run down by gravity. In that case the hand-brake may be sufficient to hold it, yet the pitch of the screw can be such that it will hold the drum and needs a kick from the motor to start it down. In that case the hand-brake will do.

To apply the hand-brake while the car is running down by gravity, the operator grips the switch-handle $A^8$ and draws the switch away from the rails 1 2 3 4, and the link to which the switch is a fixture is a part of the hand brake-lever, being hinged to it, thereby rocking the lever in its pivot, and the lower end of the lever spreads the split ring into frictional contact with the drum. Now should the motor be required to start the car down the operator will swivel the switch onto the rails 1 2 3 4 to close the circuit through the motor in the reverse direction. Then the switch has circuited the rails 1 and 3 through the metal strips 1 3 in the positive and rails 2 and 4 through the strips 2 4 in the negative direction. Then without moving the switch over the rails, but by simply swiveling the switch into and out of contact with the rails, the operator can make the motor kick the drum around repeatedly.

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

1. In an elevator, in combination, an electric motor, electric circuits, a brake comprising an electric magnet suspended on one end of a lever pivoted to the car, a stationed armature near-by, a brake-shoe on the other end of said lever, a cam-shoe on the revolving motor parts, substantially as described.

2. In an elevator, in combination, an electric motor, electric circuits, a controller comprising a broken electric circuit, with three or more separated contact-strips interposed in the broken circuit, an angular block pivoted to the car with contact-strips in pairs projecting from its angle sides for circuiting the motor, substantially as described.

3. In an elevator, in combination, vertical guides, screw-racks, a drum-screw meshed in the racks, a race of antifriction-balls bearing on the drum, the car between the guides and bearing on the balls, an electric motor with the car, electric circuits, a brake comprising an electric magnet suspended on one end of a lever pivoted to the car, a stationed armature near-by, a brake-shoe on the other end of said lever, a cam-shoe on the revolving motor parts for the purposes set forth.

4. In an elevator, in combination vertical guides, screw-racks, a screw-drum meshed in the racks, a race of antifriction-balls bearing on the drum, the car between guides and bearing on the balls, an electric motor with the car, electric circuits, a controller comprising a broken line-circuit, three or more contact rails interposed in the broken circuit, an angular block pivoted to the car with contact-strips in pairs projecting from its angular sides for circuiting the motor, substantially as described.

5. In an elevator, in combination, vertical guides, screw-racks, a screw-drum meshed in the racks, a race of antifriction-balls bearing on the drum, the car between guides and bearing on the balls, the counterweighted car having ball-bearing connection with the drum, an electric motor with the car, electric circuits, a brake comprising an electric magnet suspended on one end of a lever pivoted to the car, a stationed armature near-by, a brake-shoe on the other end of said lever, a cam-shoe on the revolving motor parts, for the purposes set forth.

6. In an elevator, in combination, vertical guides, screw-racks comprising a series of studs with antifriction-rollers thereon, a screw-drum meshed in the racks, a race of antifriction-balls bearing on the drum, the car between guides and bearing on the balls, an electric motor with the car, electric circuits, a controller comprising a broken line-circuit with three or more separated contact-strips interposed in the broken circuit and an angular block pivoted to the car with contact-strips in pairs projecting from its angle

sides, a brake comprising an electric magnet suspended on one end of a lever pivoted to the car, a stationed armature near-by, a brake-shoe on the other end of said lever, a cam-shoe on the revolving motor parts, substantially as set forth.

7. In an elevator, in combination, vertical guides, screw-racks comprising a series of studs with antifriction-rollers thereon, a screw-drum meshed in the racks, a race of antifriction-balls bearing on the drum, the car between guides and bearing on the balls, an electric motor with the car, electric circuits, a controller comprising a broken line-circuit, with three or more separated contact-strips interposed in the broken circuit and an angular block pivoted to the car with contact-strips in pairs, projecting from its angle sides; a power-brake comprising an electric magnet suspended on one end of a lever pivoted to the car, a stationed armature near-by, a brake-shoe on the other end of said lever, a cam-shoe on the revolving motor parts; and a hand-brake comprising a lever pivoted to the car with band-brake connections within the drum, substantially as described.

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Witnesses:
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