A. MAGNUSON.

ELEVATOR.

APPLICATION FILED APR. 24, 1912.

1,145,914. Patented July 13, 1915.

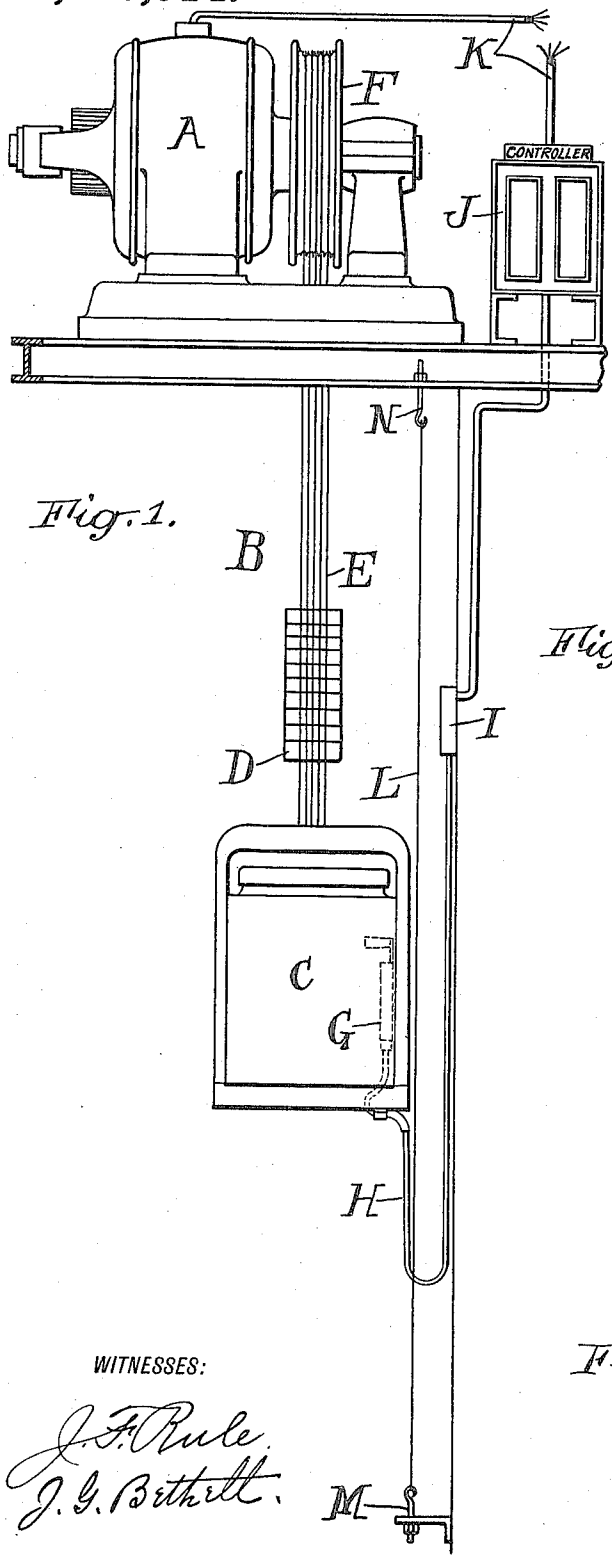


Fig. 1.

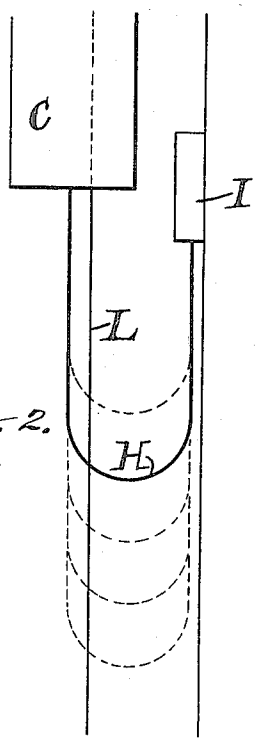


Fig. 2.

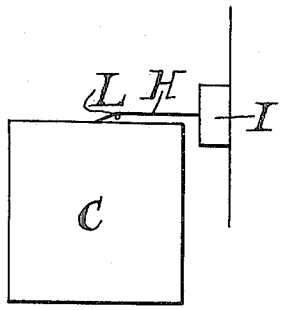


Fig. 3.

WITNESSES:

J. F. Rule.

J. G. Bethell.

Axel Magnuson
INVENTOR

L. H. Compliment
ATTORNEY

UNITED STATES PATENT OFFICE.

AXEL MAGNUSON, OF NEW YORK, N. Y., ASSIGNOR TO OTIS ELEVATOR COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELEVATOR.

1,145,914. Specification of Letters Patent. Patented July 13, 1915.

Application filed April 24, 1912. Serial No. 692,830.

To all whom it may concern:

Be it known that I, AXEL MAGNUSON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Elevators, of which the following is a specification.

My invention relates to improvements in elevators in which the car is controlled through a flexible cable comprising electric conductors. It is common in this type of elevator to suspend a flexible cable comprising the electric conductors between the car and a junction box in the hatchway, electric leads connecting the box with an electric controller, and leads connecting the controller and the hoisting motor and the car. Usually the box is placed for convenience about the middle of the extremes of the length of travel of the car and the cable is of suitable and necessary length to extend between the box and car at any point the car may be in its travel or in the hatchway. Because of the necessary length of the cable and the variable positions of the car, at the times of its starting, stopping and travel, there are times when there is a considerable depending slack or loop of cable, and which depending cable is free to be swayed or moved out of the vertical plane in which it normally hangs. The depth of the loop varies, of course both with the position of the car in the hatchway and the height of the latter; and, where the height of the hatchway is considerable, as it is in high buildings, the length of cable dangling is many feet. As the cable is suspended from the car and a point in the hatchway, naturally it should remain in a vertical plane, substantially; but, owing to external and adventitious forces, possibly originating in the movement of the car in starting and stopping, and running, frequently at high rates of speed, thereby moving the cable likewise, and the disturbance of the air in the hatchway, by the passing of the car or drafts through openings in the shaft, or because of whatever the real cause, the cable is frequently caused to be moved or swayed out of its normal vertical plane. In the circumstances, the swaying of the merely freely suspended cable would appear to be expected and unavoidable; and in cases particularly of high rises and speeds of the car, and long runs, what at first may be merely a slight swaying, may and often does develop into so wide an oscillation or swing or displacement of the suspended cable as to carry it out of the boundaries in which it is desired it shall remain. The likelihood and amount of displacement may be all the more because of the fact of the very flexibility of the conductors and cable. It will be foreseen that it is highly desirable that the cable shall not be displaced, but be supported and maintained free from all liability of accident, since if the cable shall be caught by car or counterweight or be caught on a fixed part in the hatchway, the consequence may be that the cable may be seriously damaged, even to the extent of rupture or actual severance or be torn away from its fixed ends, and the control of the car be lost. The swaying of the loop is also prejudicial to the breaking endurance and resistance of the cable and conductors and to their length of life and the support of their weight from and at their points of fixture to the car and hatchway, due to the straining effects upon the cable and conductors at those points by deflection by the swaying stress of the same. Such swaying accumulates in deflecting the cable and conductors at those points, by a certain amount of energy of motion, which is ultimately expended in increasing the deformation beyond the amount due to a steady position of the cable and conductors. If the stress should happen to exceed the limit of elasticity or tensile strength of the material of the cable and conductors—which may occur in the course of time—a sudden swing or sway or deflection of the cable and conductors may produce a sufficient strain to cause severance of the cable and conductors at or near their ends or points of fixture. Where, as is often the case, a number of cars are placed side by side, with the space between them open, the swinging of the cable is particularly objectionable, since the number of chances of an accident to it is in-

creased by the fact that the swing or swaying of the cable may extend into the path or way of the adjacent car. All these considerations and others which may arise go to show that there may be real danger in allowing the cable to remain free to be displaced by external forces.

The object of my invention is to provide means to maintain and retain the cable in a safe and secure position, and to insure the invariable control of the car and safety of its load, so far, at least, as keeping safe and intact the electric conductors. I attain these objects by the means and arrangement illustrated in the accompanying drawing, in which—

Figures 1 and 2 are vertical views, and Fig. 3 a plan view, of a conducting cable and so much of an elevator car and hatchway as to show my invention and its application thereto.

Similar reference letters refer to similar parts throughout the several views.

An electric motor A is shown, placed overhead of a hatchway, B, in which is operated a car, C, and counterweight, D, suspended by the leads of a traction-drive rope E, passed over a drive-pulley, F, on the end of the shaft of the motor. The operation of the car is controlled by a switch, G, therein, having leads extended to conductors, which comprise a cable, H, having one of its ends fixed to the car and its other end to a junction box, I, affixed in the hatchway. Electrical conductors lead from the box to a controller, J, which is electrically connected to the motor by leads, K. It will be observed that the drawing and description are merely of the arrangement of what is frequently referred to as an electric overhead friction-drive or traction elevator. I have shown this type, however, merely for convenience and as one application of my invention applied to elevators in which there is an electric cable suspended between the car and the hatchway. It is plain that I might have shown or might show any other type of elevator having suspended an electric cable; therefore, I mean that the description and illustration of this particular type shall be taken as including other types of elevators having a conducting cable between the car and the hatchway.

Having reference now to my invention, I fix vertically in the hatchway, what I will name, a guide L, for the cable, against which the latter will lightly contact or bear, and be guided and guarded in a safe and secure position. The guide may in some instances be placed out of actual contact with the cable, but near enough to serve the purpose for which it is intended. During the operation of the car, the position of the bight of the loop in the cable will be changed from one level to another, up and down, as the case may be, in the hatchway; an indication of which is shown in Fig. 2, the positions of the bight and cable being shown in full and dotted lines. I have shown my invention as embodied in a rope or wire, L, stretched taut vertically in the hatchway, the lower end secured to a threaded hook M in a bracket projecting into the hatchway and the other end fast to a threaded hook N in a beam overhead of the hatchway. If the wire shall become slack from stretching or any other cause, it can be tightened by means of the nuts on the threaded hooks. I have shown the guide, L, placed between the car and the cable, and nearer to the car than the box measured in a horizontal plane; but, of course, its relative location may not always be at that exact point, for in some cases, owing to various circumstances and considerations, the guide may be placed nearer the vertical middle of the loop of the cable or to the box than I have shown, to get the best results. The guide may also be placed in some cases, if found best, on that side of the cable opposite to where I have shown it.

It is obvious, of course, that I may employ more than one wire, on one and the same side of the cable or place them on both sides of the cable; and that I may substitute a rod or bar or other similar means for the wire. I am not aware that any person has invented means for safeguarding the depending electric conducting cable in an elevator and I desire to claim my invention as broadly as the elevator art will allow.

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

1. In an elevator, the combination of a car, an electric conductor suspended between the car and a point in the hatchway, and a guide for said conductor formed of a wire extending vertically of the hatchway adjacent the path of car travel.

2. In an elevator, the combination of a car, an electric conductor suspended between the car and a point in the hatchway, and a guide for the conductor formed of a taut wire, adjustable as to tension, and extending vertically of the hatchway to one side of the path of car travel.

3. In an elevator, the combination of a car, a conductor associated with the car, and a guide for said conductor comprising a wire extending vertically of the hatchway and located outside of the path of travel of the car.

4. In an elevator, the combination of a car, a conductor associated with the car, and a guide for said conductor comprising a wire extending vertically of the hatchway and adapted to deflect said conductor from the path of movement of the car.

5. In an elevator, the combination of a car, a conductor suspended from the car

and a point in the hatchway so as to form a depending loop in the conductor, and a vertical guide extending throughout the hatchway adapted to engage the loop in said conductor and deflect the latter from the path of movement of the car.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

AXEL MAGNUSON.

Witnesses:
J. G. BETHELL,
AUGUST SUNDH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."