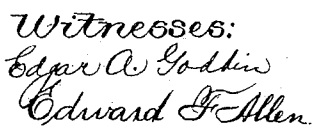


C. R. PRATT.
ELEVATOR.

Patented Dec. 22, 1896.



Inventor:
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By Crosby & Gregory attys.

UNITED STATES PATENT OFFICE.

CHARLES R. PRATT, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO THE WHITTIER MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 573,531, dated December 22, 1896.

Application filed June 29, 1891. Serial No. 397,810. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. PRATT, of New York, county of New York, State of New York, have invented an Improvement in Electric Elevators, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to elevators of that class wherein an electric motor is employed to furnish the motive power for moving the elevator-car.

In accordance with this invention the elevator mechanism, of suitable construction to move the car, is operated by an electric motor, the speed and direction of movement of the latter determining the speed and direction of movement of the former and of the elevator-car. The direction of movement of the motor is controlled by a circuit-reverser or pole-changer, while the speed of the motor is controlled by a rheostat or other suitable current-regulator, the circuit-reverser and the current-regulator being operated by a common actuator, which may be controlled from within the elevator.

One part of this invention therefore consists in the combination of an electric motor and an elevator operated thereby with a current-regulator, a circuit-reverser, and a common actuator for said current-regulator and circuit-reverser, to operate substantially as will be described.

Other features of this invention will be hereinafter described, and pointed out in the claims at the end of this specification.

Figure 1 sufficiently represents an elevator and elevator mechanism to enable my invention to be understood; Fig. 2, an enlarged detail view of the current-regulator and circuit-reverser, together with the common actuator therefor; and Fig. 3, a modification to be described.

Referring to the drawings, the electric motor M may be connected with and operate any desired elevator mechanism, the said motor, as herein represented, having its armature-shaft *m* connected with the threaded shaft *a* of an elevator mechanism A, which coöperates with a suitable nut, (not shown,) rota-

tion of the shaft *a* in the said nut moving the movable sheaves *a'* toward and from the stationary sheaves *a''*, to thus move the elevator-car C in usual manner by means of the ropes or cables *c*, secured to the top of the car and passed over suitable sheaves (not shown) at the top of the elevator-well, and thence down and about the stationary and movable sheaves *a'* *a''*, as shown, all in usual manner.

The circuit-reverser D, Fig. 2, is preferably placed upon the bottom of the elevator-car, and, as herein shown, comprises the fixed contacts 2 3 4, which coöperate with the movable contact-arms *d d'*, each pivoted at one end and connected to move in unison by the bar *d''*, carrying at its upper end a roll or other stud *d'''*, which enters the cam-slot *d''''*, formed in the end of the contact-arm *e*, pivoted on and fast to the shaft *e'*. The current-regulator, also preferably placed upon the elevator-car, is herein embodied in the form of a rheostat R, which consists of the two semi-circular series of contacts *r r'*, containing the usual resistances and adapted to be swept by a brush or brushes *r''*, carried on the outer end of the contact-arm *e*, referred to.

One of the line-wires 10, leading from any suitable generator, (not shown,) as herein represented, leads to one of the commutator-brushes of the motor M, and the other commutator-brush of said motor is connected by wire 12 with the pivotal end of the arm *d'* of the circuit-reverser D.

The fixed contacts 2 3 of the circuit-reverser are connected by a wire 13 with and through the field of the motor M, as clearly represented in Fig. 2, a wire 14 leading from the field of the motor to the pivotal shaft *e'* of the contact-arm *e* of the current-regulator. The first of each series of contacts *r r'* of the said current-regulator is connected by a wire 15 with the fixed contact 4 of the circuit-reverser, a wire 16 connecting the pivotal end of the arm *d* of said circuit-reverser with the generator.

As represented in Fig. 2, the movable arms *d d'* of the circuit-reverser are in their intermediate normal positions between the fixed contacts 2 and 4 and 3 and 4, the circuit being broken at these points, the brushes *r''*

on the contact-arm *e* of the current-regulator also lying in their intermediate normal positions between and out of contact with the end contacts of both series *r r'*, the circuit
 5 being again broken at this point. If now the contact-arm *e* should be moved to the right in the direction of arrow 20, the cam-groove *d'* in the end of the arm will act upon the roll-stud *d*² on the connecting-bar *d*² of
 10 the circuit-reverser and move the arms *d d'* of the latter into their upper dotted-line positions, closing the circuit through the arm *d* and contact 3 and the arm *d'* and contact 4, the brushes *r*² on the contact-arm *e* of the
 15 current-regulator being also moved upon the series of contacts *r'*, establishing the circuit at this point also and starting the armature of the motor *M* in one direction, as, for instance, in the direction of arrow 25, the motor
 20 acting through the shaft *a* and elevator mechanism to lift the elevator, the circuit passing from the line 10, through the armature of the motor by wire 12, through the arm *d'*, contact 4, wire 15, resistance *r'*, contact-arm *e*, wire
 25 14, field of the motor, wire 13 to the contact 3 of the reverser, thence by arm *d* and wire 16 to the generator.

To stop the elevator, it is only necessary to move the contact-arm *e* of the current-regulator and the arms *d d'* of the circuit-reverser
 30 back to their normal intermediate positions, as shown, to break or interrupt the circuit and stop the motor.

If the contact-arm *e* be moved to the left in the direction of arrow 21, the cam-groove *d'* will throw the arms *d d'* down into their
 35 lowermost dotted-line positions, Fig. 2, closing the circuit through the arm *d* and contact 4 and the arm *d'* and contact 2, the brushes *r*² on the arm *e* of the current-regulator being moved upon the series of contacts *r* to
 40 again reestablish the circuit, but in the opposite direction from before, the current now passing from the line 10, through the armature *d* of the motor by wire 12, through the arm *d'*, contact 2, wire 13, field of the motor,
 45 wire 14, contact-arm *e*, resistance-contact *r*, wire 15 to the contact 4 of the circuit-reverser, thence by the arm *d* and wire 16 to the generator. The current in this instance, passing through the field of the motor in a
 50 direction opposite to that in which it passed when the arm *e* is moved to the right, will cause the armature of the said motor to revolve in the opposite direction, as indicated
 55 by the arrow 26, to thus operate the elevator mechanism in the opposite direction to start and move the elevator-car in the opposite direction.

According as the arm *e* of the current-regulator is moved in one or the other direction will the armature of the motor *M* be caused to revolve in one or the other direction to raise or lower the elevator, and according as
 60 the arm *e* is moved a greater or less distance in either direction over the series of contacts and resistances *r r'* will the current be stronger

or weaker to thus cause the armature of the motor to revolve at a higher or lower speed and move the elevator faster or slower. 70

In practice the current-regulator and the circuit-reverser will both be operated by a common actuator (herein represented as a hand-wheel *h*) accessible from the interior of the elevator-car, and represented by dotted
 75 lines, Fig. 1, said hand-wheel being fast on the shaft *h'*, extended through and journaled in suitable bearings in the side of the car, and having fast upon it outside the car a wheel or sheave *h*², about which is passed a
 80 belt or cable *h*³, extended down over the sheaves *h*⁴ and passed about a pulley or sheave *h*⁵, fast on the shaft *e'* of the current-regulator *R*, so that as the hand-wheel *h* is rotated in one or the other direction by the
 85 operator in the car the pulley or sheave *h*⁵, the shaft *e'*, and contact-arm *e* will be rotated in the same direction to operate the elevator, as previously described.

In practice a certain amount of lost movement is provided between the current-regulator and the circuit-reverser, so that the latter may be fully moved before the former has closed the circuit through the first of its contacts. 90

Referring to Fig. 2, the distance between the lower adjacent ends of the two series of contacts *r r'* will be such that the circuit-reverser will be fully moved into one or the other of its extreme positions to determine the
 100 direction of the current before the brushes on the contact-arm shall have come into contact with the first of either of the series of contacts *r r'*.

Instead of the arrangement herein shown 105 the current-regulator and circuit-reverser may be placed at the bottom of the elevator-well or other convenient place, as shown in Fig. 3, and the pulley or sheave *h*⁵ operated by the usual shipper-rope. 110

This invention is not limited to the particular construction and arrangement shown, as the same may be varied, and instead of the current-regulator and circuit-reverser herein shown any other equivalent devices 115 may be employed.

I claim—

1. The combination with a traveling elevator, and an electric motor to operate the same, of a current-regulator and circuit-reverser 120 on the elevator-car, a hand-wheel and a cable connecting it with and to positively operate said current-regulator and circuit-reverser, substantially as described.

2. The combination with a traveling elevator, and an electric motor to operate the same, of a current-regulator on the elevator-car, and having a pivoted contact-arm, a sheave to move the same, belted to, and moved by a hand-wheel also on the car, a cam on the said 130 contact-arm and a circuit-reverser operated thereby, substantially as described.

3. The combination with a traveling elevator, and an electric motor to operate the same,

of a current-regulator on the car, and having
a pivoted contact-arm, and means to move
the same, and a longitudinally-movable bar,
operated by the rotative movement of said
5 contact-arm, and a circuit-reverser controlled
by the longitudinal movement of said bar,
substantially as described.

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

CHARLES R. PRATT.

Witnesses:

FREDERICK L. EMERY,
EMMA J. BENNETT.