(No Model.) 2 Sheets—Sheet 1.

C. W. BALDWIN.

ELEVATOR CONTROLLER.

No. 456,107. Patented July 14, 1891.

Fig. 1.

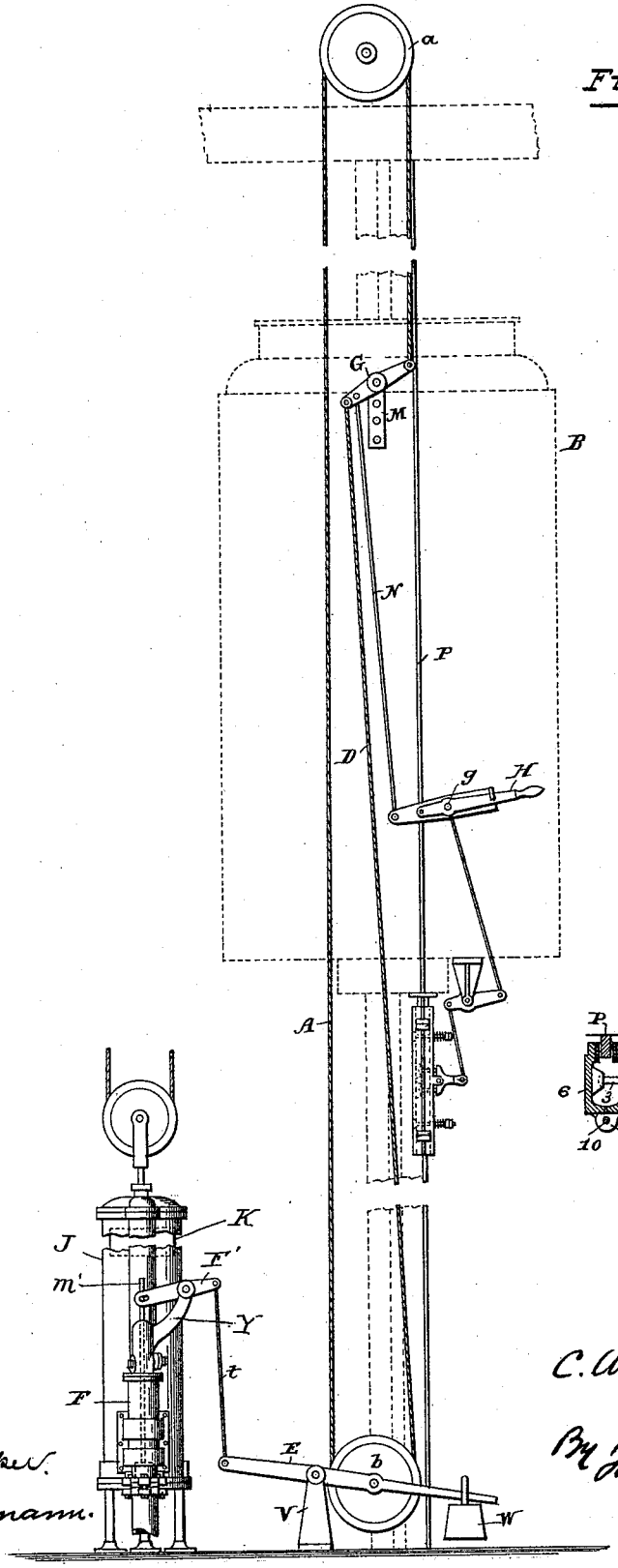
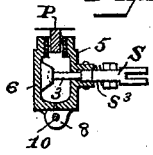


Fig. 1ª



Attest:
Court. A. Cooper.
H. C. Fannmann.

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Inventor.
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Attys

(No Model.) 2 Sheets—Sheet 2.

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ELEVATOR CONTROLLER.

No. 456,107. Patented July 14, 1891.

Fig. 2.

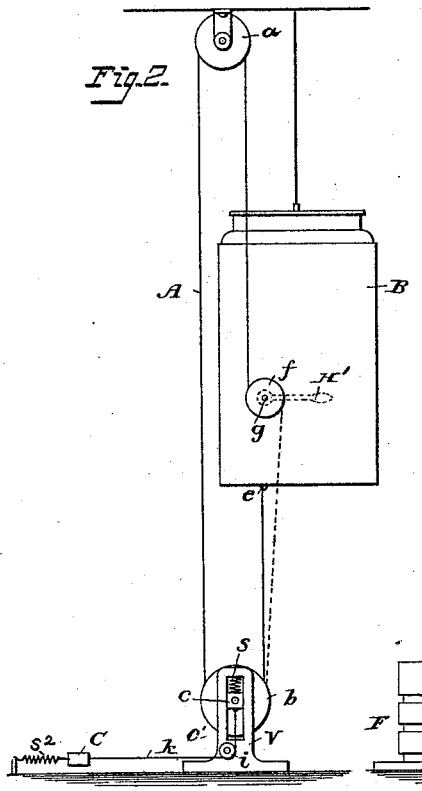


Fig. 3.

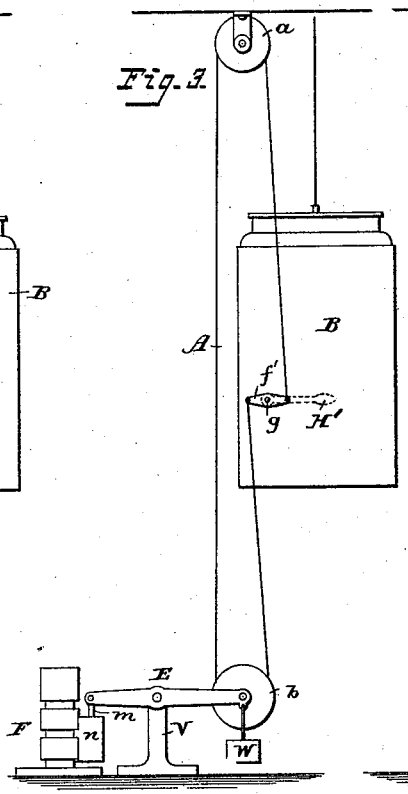
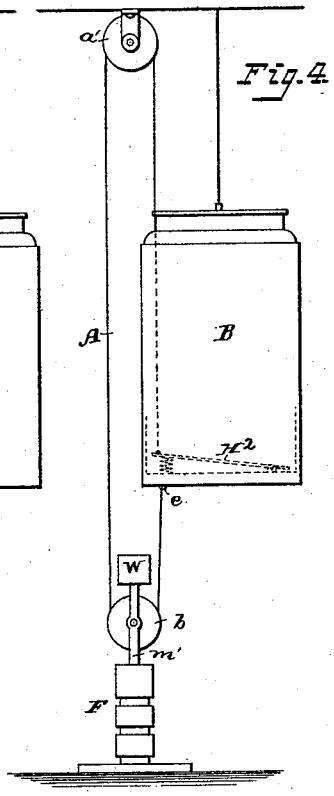


Fig. 4.



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UNITED STATES PATENT OFFICE.

CYRUS W. BALDWIN, OF YONKERS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF ILLINOIS.

ELEVATOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 456,107, dated July 14, 1891.

Application filed October 10, 1885. Serial No. 179,543. (No model.)

To all whom it may concern:

Be it known that I, CYRUS W. BALDWIN, a citizen of the United States, and a resident of Yonkers, in the county of Westchester, in the State of New York, have invented certain new and useful Improvements in Valve Apparatus for Elevators, of which the following is a specification.

My invention relates to that class of elevating apparatus in which a vertically-traveling cage is controlled by the adjustment of a stopping and starting apparatus—such as a valve, belt-shifter, &c.—by devices operated from within the cage; and my invention consists in the construction of the controlling devices, as fully set forth hereinafter.

In the drawings, Figure 1 is an elevation illustrating sufficient of a hydraulic elevator to show my improvement. Fig. 1ª is a cross-sectional view through the friction device. Figs. 2, 3, and 4 are diagrammatic elevations illustrating different means of controlling the operating rope or cable connected with the stopping and starting mechanism, together with different connections between the rope and the said stopping and starting mechanism.

My invention is intended to be used with that class of elevators in which an attendant within the cage controls the position or operation of the stopping and starting device, and my invention can be used in this class of elevators with any of the various stopping and starting devices which are in common use, whether they be belt-shifters, valves, switches, or other appliances, whereby the elevator-engine is either put in motion in one direction or the other or arrested or thrown into or out of connection with the parts which directly move the cage.

It has been common in elevators of this class to operate the stopping and starting device by means of a vertical rope or cable occupying a vertical position in the well and normally stationary, the operator seizing the rope by hand and moving it to move the stopping and starting device. This mode of operation is attended with disadvantages too well known to require specific statement here, and which I overcome by the use of flexible means, as a traveling rope or cable connected to move with the cage and capable of being moved or adjusted independently of its traveling movement by the action of the operator in the cage, so as to alter the position of the stopping and starting device.

In using a traveling cable I may connect it with the cage and to the stopping and starting device in different ways and by the use of different appliances without in any way departing from the main features of my invention. Thus in Fig. 1 I have illustrated the traveling cable A in connection with a vertically-moving cage B and with the valve of a hydraulic elevator-engine of the well-known Baldwin construction, having a cylinder J, piston K, circulating-pipes, valve-casing F, and valve-stem m', to which the cable A is connected in any suitable manner, so that by properly shifting the position of the cable the engine may be started in either direction or stopped. The cable A is connected at both ends to the cage or to an attachment thereof and passes over a pulley a, turning upon stationary bearings at the top of the well and beneath a pulley b, carried in a movable bearing at the bottom of the well, the movable bearing in this case consisting of a lever E, carrying the pulley b and pivoted to a standard V. One end of the lever E is connected by a rod t to a lever F′, swinging on an arm Y, secured to the valve-casing and connected to the valve-stem m', and the other end of the lever E is weighted, the weight tending to carry the pulley b downward to move the stopping and starting device in one direction, and also serving to take up the slack and maintain the cable taut. The ends of the flexible connecting means may be moved by a suitable operating device from within the cage. For instance, the cable A is secured to the opposite ends of a lever G, which may be moved from the inside of the cage. Thus it is pivoted to a bracket M at the top of the cage, and a rod N connects the lever G with an operating-lever H, pivoted within the cage to a pivot or shaft g, so that by moving the lever H the end supports of the cable may be brought toward each other or separated, so as to contract or

lengthen the loop formed by the extension of the cable over its pulleys, and thereby lift or lower the lower pulley without interfering with the free travel of the cable with the cage as the latter moves, the change in the vertical position of the pulley altering the position of the stopping and starting device.

I have illustrated in Fig. 1 one arrangement of devices for contracting and extending the cable-loop to move the stopping and starting device; but it will be evident to any one skilled in the art that these devices may be greatly varied, and I will hereinafter refer to some modifications which may be used. Either pulley may be supported in a movable bearing, and different forms of movable bearings may be adopted with like effects, and various connecting appliances may be used between the movable pulley *b* and the stopping and starting device, so as to transfer the vertical motion of the pulley to the said device. For instance, where a belt-shifter is used a flexible connection in the shape of a cord or band *k*, Fig. 2, may be employed, the said band being connected at one end to a bearing *c* of the pulley *b*, said bearing sliding in a slot *c'* in a standard V, the band *k* passing round a grooved guide-pulley *i* and being connected at the other end to the bar or arm C of the belt-shifter, which is moved in one direction by a spring s^2, and a spring *s*, acting like the weight W in Fig. 1, may exert a downward pressure upon the bearing *c*, so as to insure the downward movement of the pulley when the length of the loop is increased. A weight may be substituted for the spring *s*, or the pulley *b* may be made so heavy as to insure its descent as the length of the loop is increased. One end of the cable may be secured to an eye *e* on the cage and the other to the periphery of a disk *f* on a shaft *g*, extending through the side of the cage and carrying the operating-lever H' at the inner end. By moving the lever H' so as to wind the rope upon or unwind it from the disk *f* the length of the rope between its connecting points may be increased or diminished, so as to raise or lower the position of the pulley *b*, and this change in the position of the said pulley is made the means of moving the arm C or other stopping or starting device, as before described.

Instead of connecting one end of the cable directly to the cage, both ends may be connected to the disk or pulley *f* at opposite sides, as shown in dotted lines, Fig. 2, without altering the effect of manipulating the lever H.

I do not here claim the construction which is shown in dotted lines, Fig. 2, as it is the subject-matter of a separate application, Serial No. 162,593, filed April 17, 1885.

An equivalent of the last-described connection is shown in Fig. 3, where a cross-bar or lever *f'* is secured to the shaft *g*, carrying the lever H', and the ends of the cable are connected to the opposite ends of the cross-bar, the tilting of which in one direction or the other lengthens or contracts the extent of cable between the pulleys *a b*.

In Fig. 4 I have shown another modification, in which one end of the cable is secured to the bottom of the cage, while the other passes through an opening in the top of the cage and is connected directly to an operating lever or treadle H^2 within the cage, so that the operator by placing his foot upon the said lever may contract the length of the cable between the pulleys *a b* and thereby lift the lower pulley. This specific construction, embodying the cable connected at one end to the cage and at the other directly to an operating device inside the cage, I do not here claim, as the same constitutes the subject of an application filed June 13, 1891, Serial No. 396,128. The lever-bearing E of the movable pulley *b* may be connected to the stem *m* of an auxiliary valve in a casing *n*, adjacent to the casing F of the main valve, Fig. 3, so that as the rope A is contracted or elongated the lever E will be vibrated to adjust the auxiliary valve, the construction of the latter and its operation with the main valve of a hydraulic elevator being too well known to need description here and constituting no essential part of this invention.

When a valve device is used for stopping and starting the engine, the arrangement may be such as to operate the main valve rather than an auxiliary valve. One construction adapted for this purpose is shown in Fig. 1, and has been already described. Another is shown in Fig. 4, in which F represents the case of the main valve *m'*—the stem of the main valve—upon which are the bearings of the lower pulley *b*, a weight W insuring the descent of the pulley and valve when pressure is removed from the lever within the cage.

While I have shown different arrangements and connections of the traveling cable or cord or rope with the cage and different means for elongating and contracting it between its supports and different means for transferring the vertical movement of the rope, which is independent of its traveling movement, to the stopping and starting device, I do not wish to be understood that the said arrangement and connections are the only ones which I might use in carrying out the main feature of my invention, inasmuch as any skilled mechanic could vary these features indefinitely without departing from my invention. In connection with the lever H, I have illustrated a friction-brake device, which need not be described, as the same constitutes the subject of Letters Patent No. 358,322, granted to me February 22, 1887.

I claim—

1. In a controlling device for elevators, the combination of a car, flexible means attached to the car to travel therewith, a stopping and starting device connected with said flexible means, and a device on the car to take up or pay out said flexible means to shift the stop-

ping and starting device, substantially as set forth.

2. In controlling devices for elevators, the combination of a car, a stopping and starting device, flexible means attached to the car to travel therewith and connected with the stopping and starting device, a device on the car to take up and pay out said flexible means, and a weight to move the stopping and starting device in one direction and to maintain the flexible means taut, substantially as set forth.

3. The combination, with the vertically-moving car of an elevator and with the starting and stopping device thereof, of a traveling cable connected with the car, appliances upon the car for extending and contracting the length of cable between its bearings, and connections between the cable and the stopping and starting device whereby the latter is moved as the cable is contracted or extended, substantially as set forth.

4. The combination, with the car and the starting and stopping device of an elevator, of a traveling cable passing around pulleys at the top and bottom of the well and connected with the car, appliances connected with the car for taking up and letting out the cable, so as to shift the position of one of the pulleys, and connections between the latter and the starting and stopping device, substantially as set forth.

5. The combination of the cage, pulleys, one turning upon fixed and the other upon movable bearings and the latter connected to operate the stopping and starting device, a cable passing round both pulleys, and a lever carried by the car and connected to the cable, substantially as and for the purpose set forth.

6. The combination of the cage, pulleys at the top and bottom of the well, a cable passing round said pulleys, and a cross bar or lever pivoted to a bearing on the cage, the cable connected with the lever at opposite ends, substantially as set forth.

7. The combination, with the car and its controlling device, of a lever or hand device carried by the car, a sheave and bearings therefor at the bottom of the shaft and adapted to move upward and downward, another sheave at the top of the shaft, a flexible connection passing round the sheaves from top to bottom of the shaft and connected at one end with said lever, and connections between the controlling device and the movable bearings for the sheave at the bottom of the shaft, through which the movement of the lever and the rising movement of the sheave will effect the shifting of the controlling device, substantially as described.

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

CYRUS W. BALDWIN.

Witnesses:
ZENO T. GRIFFIN,
SAML. KERR.