

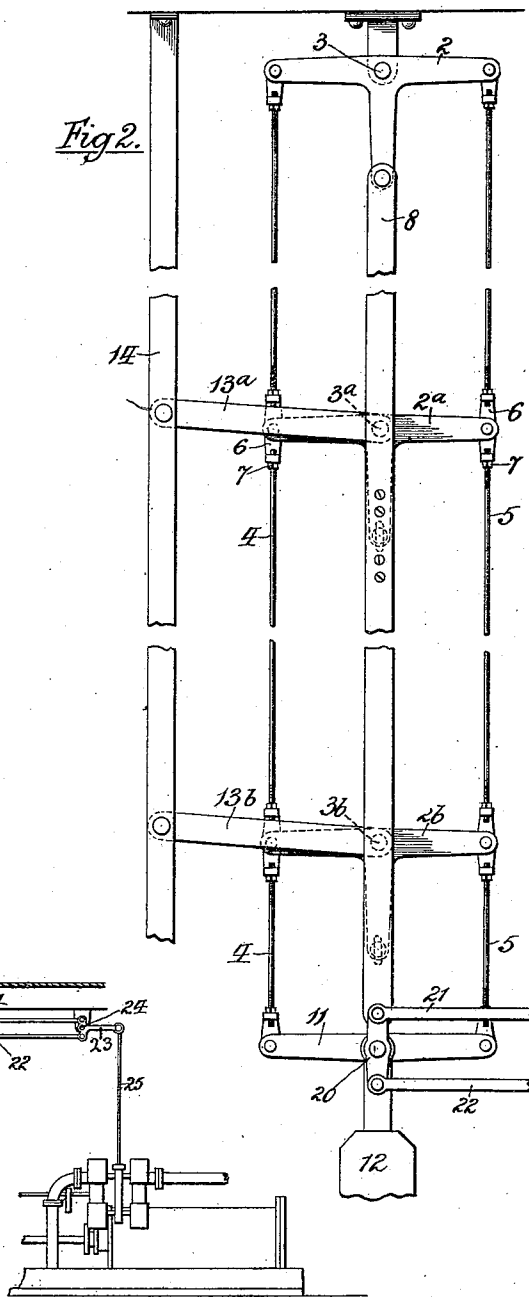
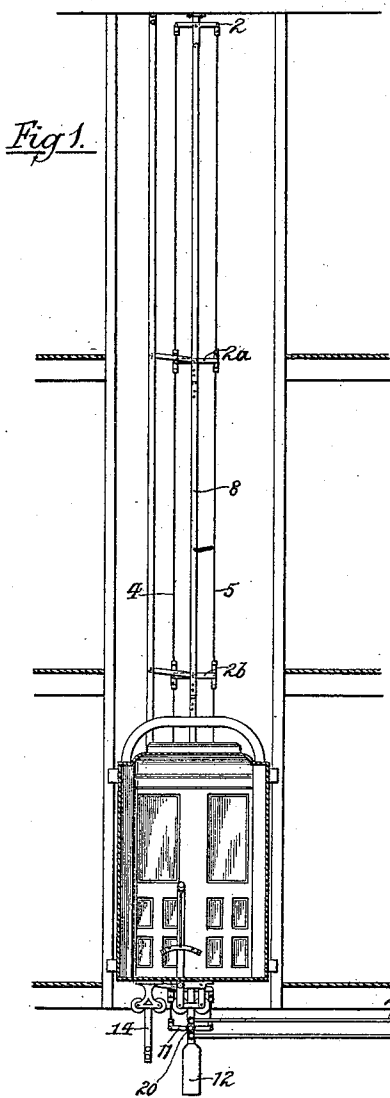
(No Model.)

2 Sheets—Sheet 1.

H. ROWNTREE & I. VEEDER.  
ELEVATOR CONTROLLER.

No. 473,199.

Patented Apr. 19, 1892.



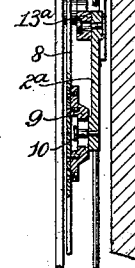
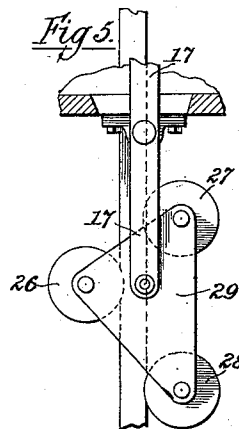
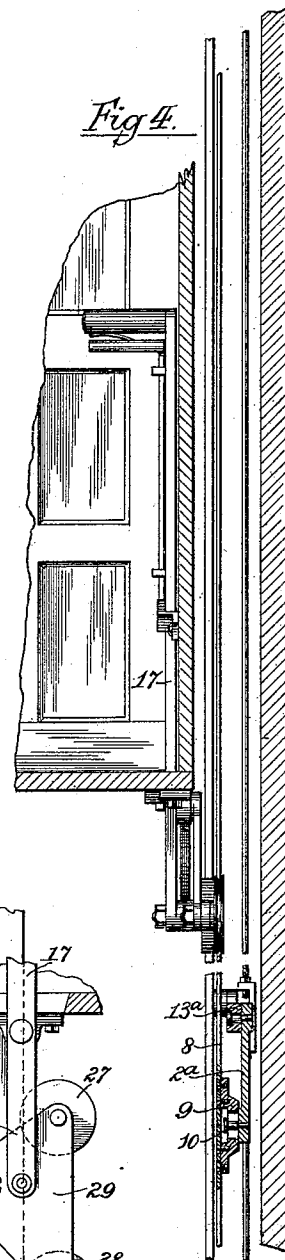
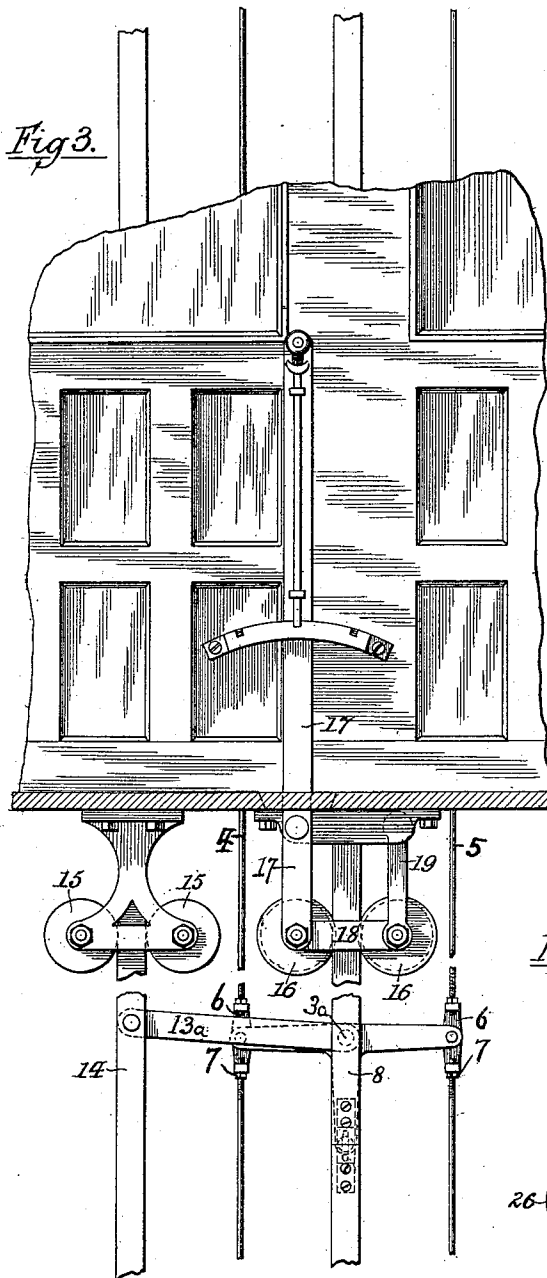
*Witnesses*  
*Wm. J. Fleming*  
*Wm. M. Rheem*

*Inventors*  
*Harold Rowntree and*  
*Irvine Veeder*  
*by Raymond & Veeder*  
*Attorneys.*

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*Harold Rowntree*  
*Igor Veeder*  
*by Raymond & Veeder Attorneys.*

# UNITED STATES PATENT OFFICE.

HAROLD ROWNTREE, OF KANSAS CITY, MISSOURI, AND IRWIN VEEDER, OF CHICAGO, ASSIGNORS TO THE CRANE ELEVATOR COMPANY, OF CHICAGO, ILLINOIS.

## ELEVATOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 473,199, dated April 19, 1892.

Application filed February 5, 1892. Serial No. 420,400. (No model.)

*To all whom it may concern:*

Be it known that we, HAROLD ROWNTREE, residing at Kansas City, county of Jackson, and State of Missouri, and IRWIN VEEDER, residing at Chicago, county of Cook, and State of Illinois, both citizens of the United States, have invented certain new and useful Improvements in Means for Controlling the Operation of Elevators, of which the following is a specification, reference being had to the accompanying drawings.

Our invention is intended to effect the movement of the valve, switch, or other device by which the elevator engine or motor is controlled by means of a bar or rod extending up and down the elevator-shaft and capable of movement under a lateral pressure applied to it through devices under the control of the attendant upon the car.

The special purposes of our present invention are the provision of means for suspending and connecting said laterally-movable rod, whereby its proper operation is assured under the varying conditions to which it is subjected in practice. To this end we have provided means whereby the parts may expand and contract, the settling of the building may take place, and other disturbances of the supports of said rod may occur without the binding or derangement of the action of the control mechanism.

In the drawings, Figure 1 shows an elevator-shaft, in which is placed our improved control devices, an elevator-car, and the portion of the control devices thereon being also illustrated. Fig. 2 shows, on an enlarged scale, the laterally-movable rod and its attachments. Fig. 3 shows a fragment of the elevator-car and a portion of the control devices. Fig. 4 is a view of the same, taken on a plane at right angles to that of Fig. 3, and Fig. 5 shows a modification of the connection between the lever device upon the car and the laterally-movable rod.

At intervals within the elevator-shaft are pivoted a number of T-levers 2 2<sup>a</sup> 2<sup>b</sup>, &c., (*vide* Figs. 1 and 2,) the upper T-lever 2 having a fixed support for its pivot 3, the pivotal points 3<sup>a</sup> 3<sup>b</sup>, &c., of the other levers being vertically, but not laterally, movable by any

force tending to displace the said levers. The horizontal force of the respective T-levers are connected to each other by tie-rods 4 5 upon each side, which rods may each be a single piece extending the length of the shaft, or preferably, as shown, may consist of a number of sections connected at each lever to a threaded socket-piece 6, by which the relative positions of the several T-levers to each other may be adjusted. The position of the levers having been properly adjusted, the connection between the rod-sections and the socket-pieces 6 is made rigid by the jam-nuts 7, which prevent the accidental rotation of the sections of the rods 4 and 5 and also prevent looseness and wear at the threaded parts. Thus the positions of the levers 2<sup>a</sup> 2<sup>b</sup>, &c., vertically are determined by the rods 4 5, as the pivots 3<sup>a</sup> 3<sup>b</sup>, &c., upon which the levers turn, are free to adjust themselves vertically to accommodate said levers, while the lateral positions of the said levers and pivots are determined by the supports for the pivots.

Pivoted to the ends of the vertical arms of the levers 2 2<sup>a</sup>, &c., is the bar 8. The joints between the bar 8 and all of the T-levers except the upper one are capable of independent vertical movement. The details of said joint are seen in Fig. 4, in which a socket-piece 9 (which may also serve as a connection between the several sections of the bar 8) is shown as attached to the back of the bar 8. In this socket-piece is a vertical slot, within which projects the pin 10, rigidly secured to the vertical arm of the T-lever 2<sup>a</sup> 2<sup>b</sup>, &c.

The lower ends of the rods 4 5 are connected by a lever 11, (*vide* Figs. 1 and 2,) and to this lever is pivoted a weight 12, which keeps both rods 4 and 5 taut. The pivotal points of the T-levers 2<sup>a</sup> 2<sup>b</sup>, &c., are permitted to move vertically, but not laterally, through the use of the links 13<sup>a</sup> 13<sup>b</sup>, which are connected at one end to the pivots 3<sup>a</sup> 3<sup>b</sup> of the T-levers 2<sup>a</sup> 2<sup>b</sup>, respectively, as seen in Figs. 3 and 4. The other ends of the links 13<sup>a</sup> 13<sup>b</sup>, &c., are pivoted to a bar 14, this bar being supported as against lateral movement by guide-pulleys 15 15, (*vide* Fig. 3,) carried upon a fixed support attached to the car; but it is not necessary in all cases to use the bar 14, as the

pivots of the outer ends of the links 13<sup>a</sup> 13<sup>b</sup>, &c., may be attached directly to a fixed point within the well, the object of pivoting the links to the bar being to neutralize any lateral motion which may occur in the car, owing to looseness in its guides. For imparting lateral movement to the bar 8 sheaves 16 16, running upon the edges of the bar, are employed. Said sheaves are supported by link-work consisting of the lower end of the hand-lever 17 and the links 18 and 19, whose points of connection and of attachment to the car form a parallelogram, as shown. The lateral movement of the bar 8 is transmitted to the operating device, whatever it may be, governing the action of the motor or engine by the connection shown in Figs. 1 and 2.

Pivoted to a vibrating arm 20, which is connected to the lever 11 before described, are two parallel links 21 22 of equal length, whose opposite ends are pivoted to a lever 23, having a fixed point of support 24. Thus the four points of connections between the arm 20, the lever 23, and the links 21 22 form a parallelogram. The lever 23 is connected in any suitable manner, as by a rod 25, to the switch or control-valve-operating device. It is obvious that with the link-work connection thus described the vertical rise or fall of the lever 11, due to the expansion or contraction of the rods 4 and 5 or the settling of the building, will not affect the position of the lever 24, which moves the operating device.

Fig. 5 shows a modification of the arrangement of the sheaves for moving the bar 8 and of their connection to the hand-lever 17. In the modification shown one sheave 26 is used upon one side of the bar and two sheaves 27 28 are used upon the other side. The pivots of said sheaves are supported in a triangular frame 29, and near the central portion of this frame is pivoted the lower end of the hand-lever 17. Thus close contact between the sheaves and the bar is secured in all positions of the hand-lever without the use of link-work such as is shown in Figs. 3 and 4.

The mode in which the lateral movement of the bar 8 is utilized to effect the movement of the operating device has been explained and the functions of the various adjusting and compensating devices employed have been pointed out in connection with their description. It is obvious that the functions of some of the compensating devices are independent, to a certain extent, of the other—that is to say, not all of them need to be used in any given case, though each contributes to the general purpose of effecting an accurately-controllable movement of the operating valve or device.

Without confining ourselves to the exact devices herein shown and described, we claim—

1. In an elevator-control apparatus connected to the device governing the motor, the combination of a series of levers having vertical and horizontal arms, a bar suspended in

the elevator-shaft upon the vertical arms of said levers, connections between the horizontal arms of said series of levers, and pivots upon which said levers turn, which are, except as to the uppermost lever, free to adjust themselves vertically to accommodate said levers, substantially as described.

2. In an elevator-control apparatus connected to the device governing the motor, the combination of a series of levers having vertical and horizontal arms, a bar suspended in the elevator-shaft upon the vertical arms of said levers, connections between the horizontal arms of said series of levers, pivots upon which said levers turn, which are, except as to the uppermost lever, free to adjust themselves vertically to accommodate said levers, and a weight adapted to maintain the tension of said connections, substantially as described.

3. In an elevator-control apparatus connected to the device governing the motor, the combination of a bar suspended in the elevator-shaft, devices carried by the car and adapted to impart a lateral movement thereto, said devices consisting of a triangular frame pivoted to a hand-lever and three sheaves upon said frame adapted to make contact with the opposite edges of said bar, a series of T-levers connected to said laterally-movable bar and having, except as to the upper T-lever, the pivots upon which they turn free to adjust themselves vertically to accommodate said levers, and rods connecting the horizontal arms of said series of T-levers, substantially as described.

4. In an elevator-control apparatus connected to the device governing the motor, the combination of a laterally-movable bar pivoted to a series of T-levers, rods connecting the horizontal arms of said T-levers, a device upon the car, adapted to impart lateral movement to said bar, and a series of pivots upon which said T-levers turn, said pivots, excepting the uppermost, being attached to links whose opposite ends have pivotal supports, substantially as described.

5. In an elevator-control apparatus connected to the operating device governing the motor, the combination of a bar suspended in the elevator-shaft and capable of lateral movement, a series of T-levers connected to said bar and having their horizontal arms connected by rods, a second bar supported in the elevator-shaft and pivotally connected to the T-levers, devices upon the car by which the first-named bar may be moved laterally, and guides upon the car adapted to the second-named bar, substantially as described.

6. In an elevator-control apparatus, the combination of a bar suspended in the elevator-shaft, devices upon the car adapted to impart a lateral movement thereto, a series of T-levers connected to said laterally-movable bar and having, except as to the upper T-lever, the pivots upon which they turn free to adjust themselves vertically to accommodate said levers, rods connecting the horizontal

arms of the said series of T-levers, a weight adapted to maintain the tension of said rods, and the connection to the operating device governing the movement of the motor, whereby the movement of said laterally-movable bar is transmitted to said operating device, said connection consisting of a lever having a fixed pivot, parallel rods connected at their ends to said lever and at their opposite ends to a rocking arm actuated by the movable bar, substantially as described.

7. The combination, in an elevator-control apparatus, of a bar suspended in the elevator-shaft, devices upon the car, adapted to impart a lateral movement thereto, a series of T-levers connected to said laterally-movable bar and having, except as to the upper lever, vertically-movable pivots, rods connecting

the horizontal arms of said series of T-levers, the lever connecting the lower ends of said rods and having suspended therefrom a weight, a vibrating arm connected to said lever, a lever having a fixed pivot connected to the actuating device by which the motor is governed, and parallel links connecting said last-named lever and said vibrating arm, substantially as described.

HAROLD ROWNTREE.

IRWIN VEEDER.

Witnesses as to signature of Harold Rowntree:

E. H. SOULE,

C. G. OVERMEYER.

Witnesses as to signature of Irwin Veeder:

VIRGINIE HUGO,

TODD MASON.