(No Model.)

2 Sheets—Sheet 1.

J. REICHMANN.

ELEVATOR CONTROLLING DEVICE.

No. 532,583. Patented Jan. 15, 1895.

Fig. 1.

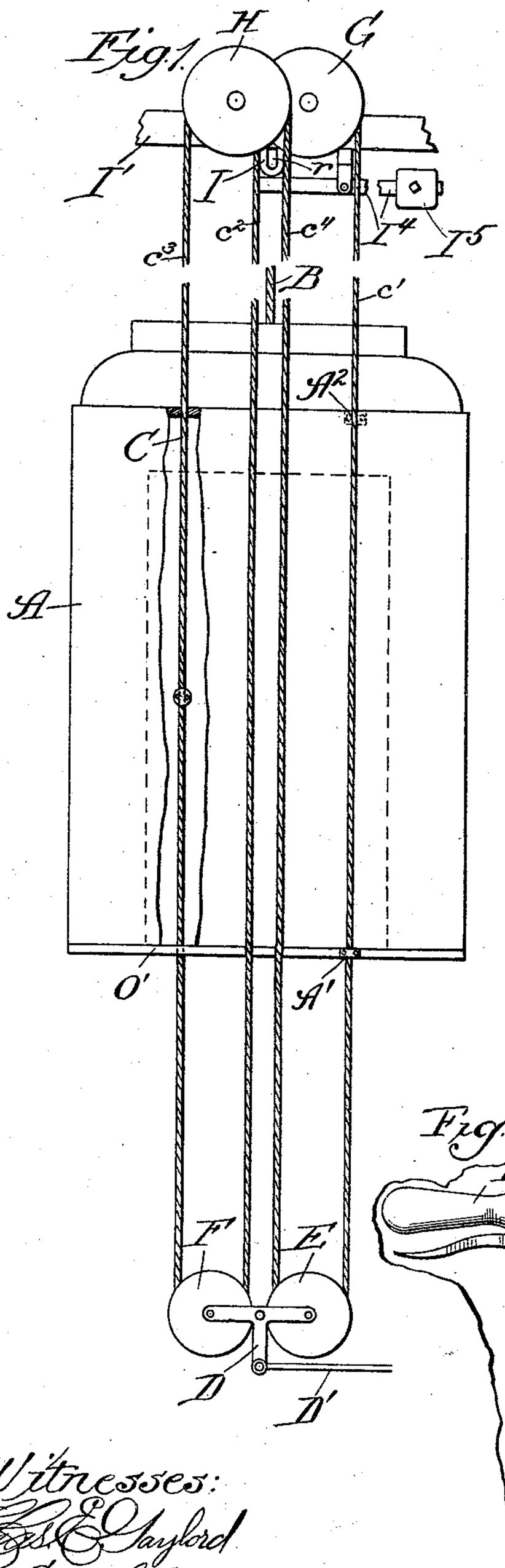


Fig. 2.

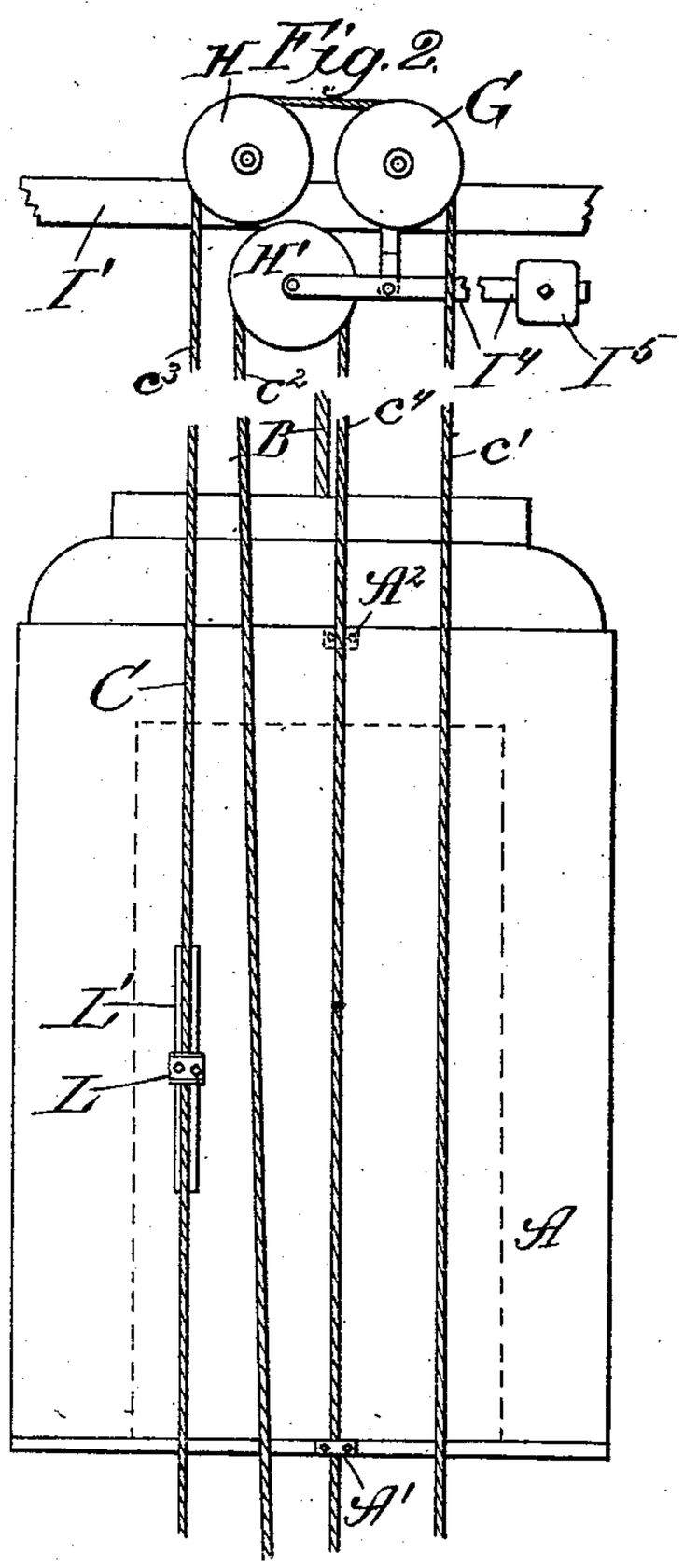
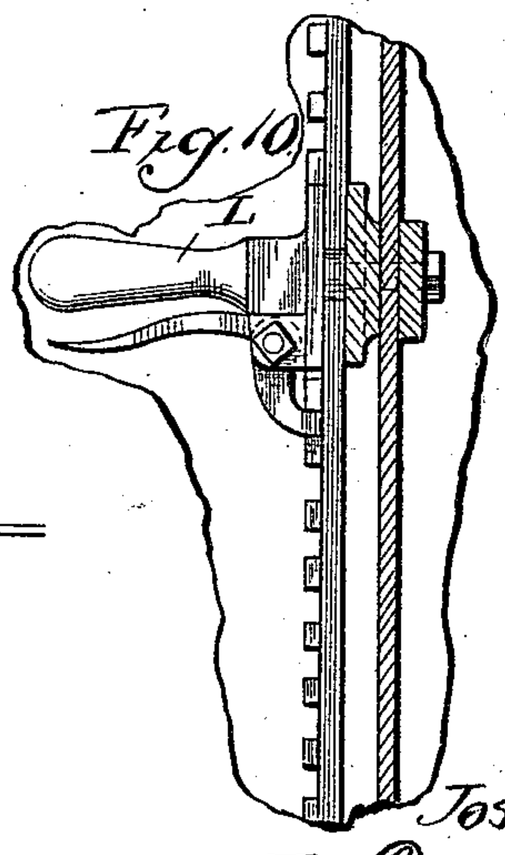


Fig. 10.



Witnesses:
Chas. E. Gaylord
Lute J. Alter.

Inventor:
Joseph Reichmann.
By Dyrenforth and Dyrenforth
Attys.

(No Model.) 2 Sheets—Sheet 2.

J. REICHMANN.

ELEVATOR CONTROLLING DEVICE.

No. 532,583. Patented Jan. 15, 1895.

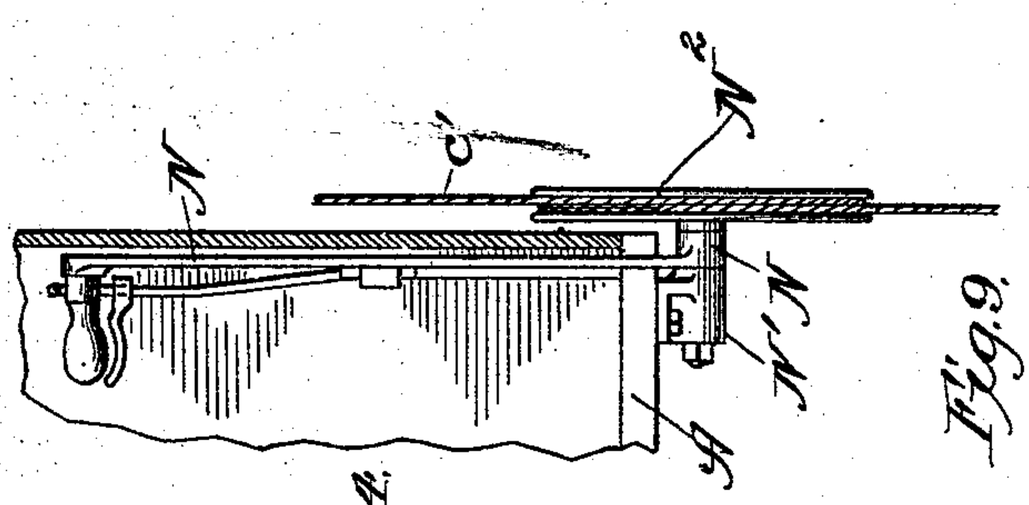


Fig. 4.

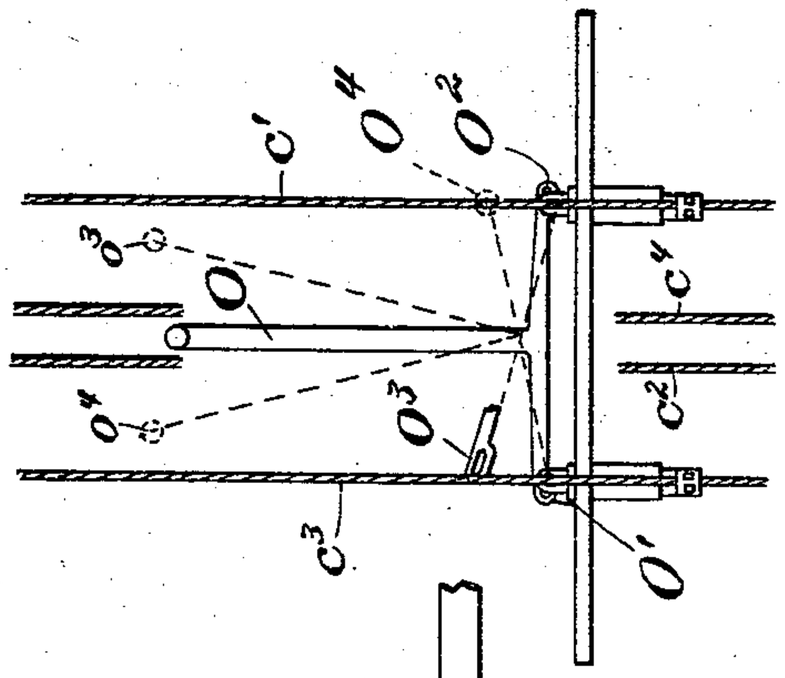


Fig. 9.

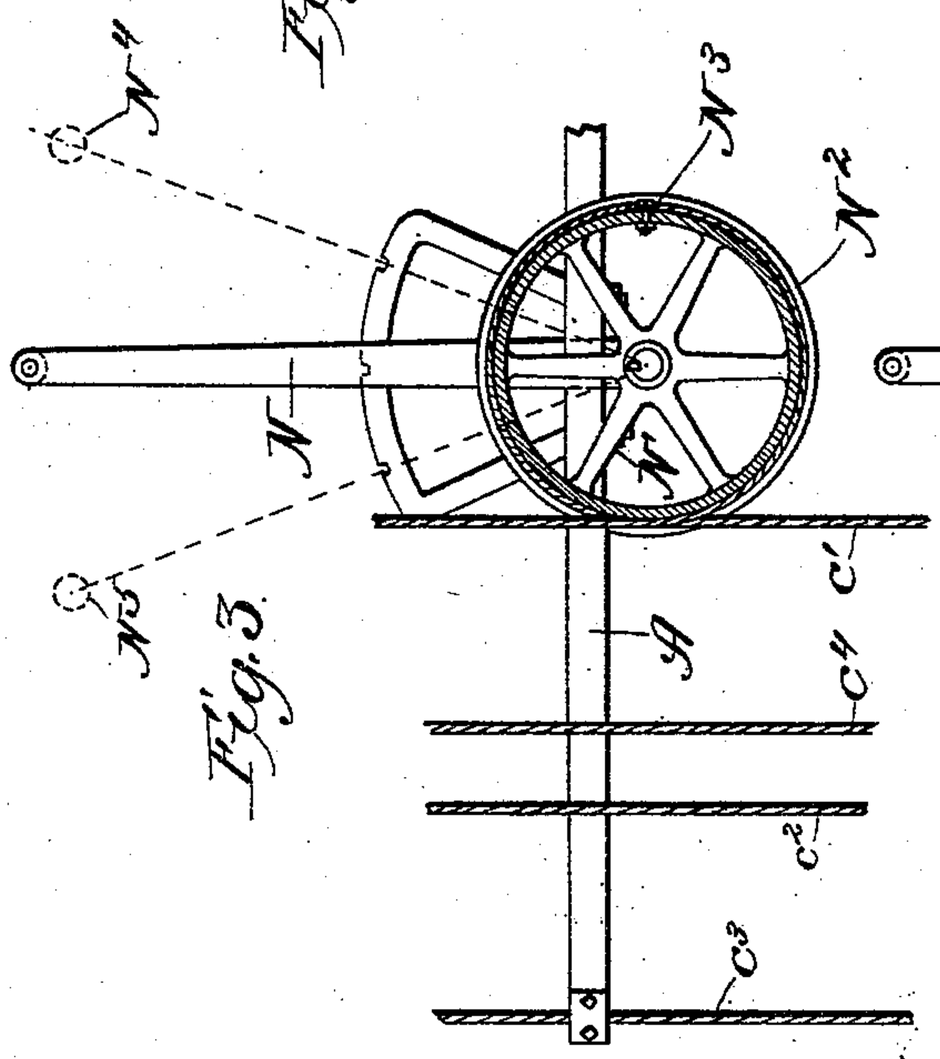


Fig. 3.

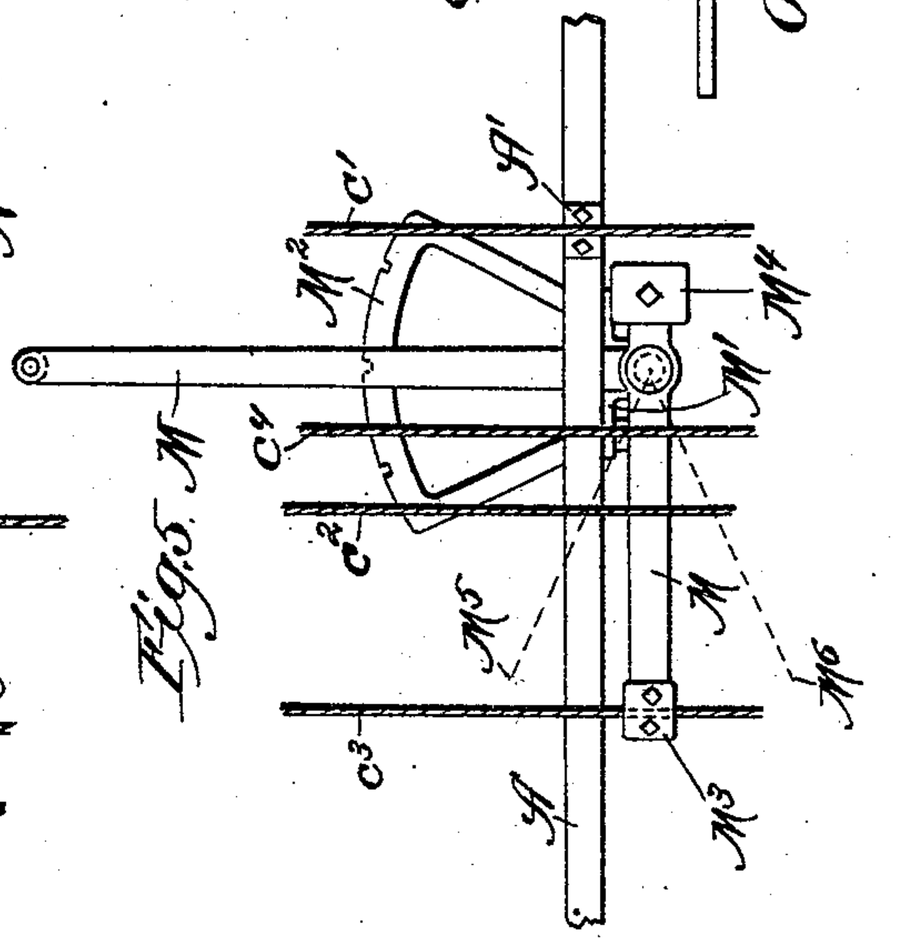


Fig. 5.

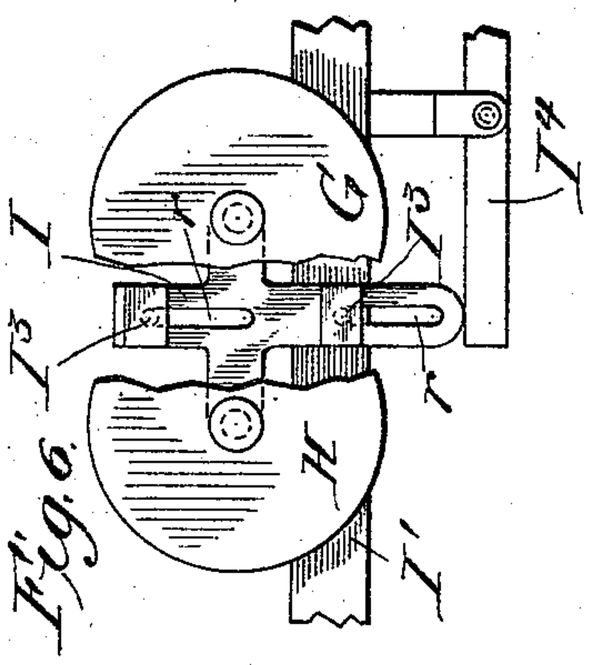


Fig. 6.

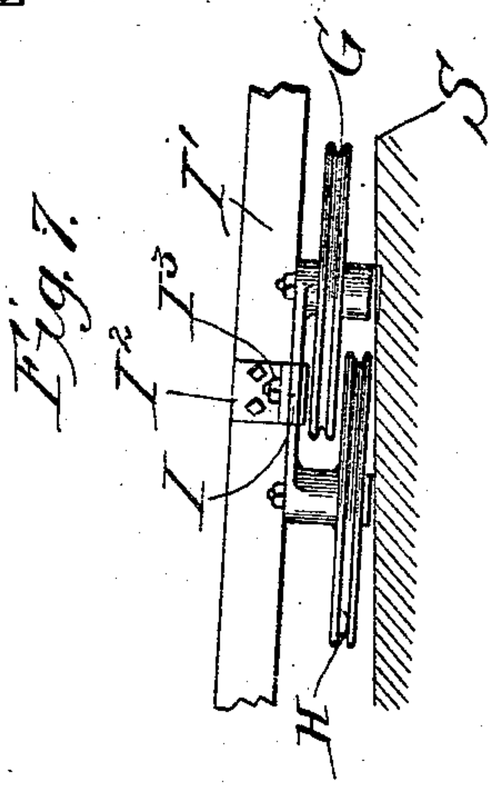


Fig. 7.

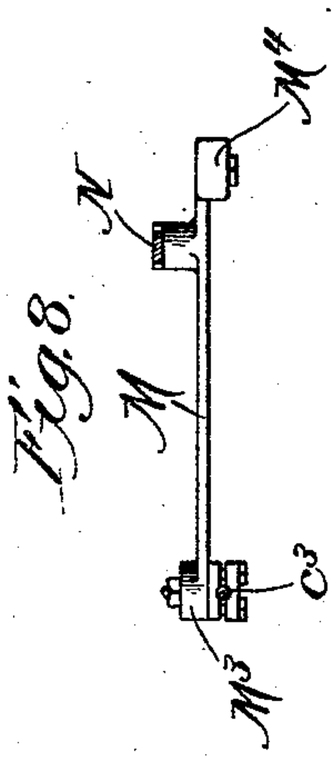


Fig. 8.

Witnesses:
Chas. E. Gaylord,
Leite f. Miller.

Inventor:
Joseph Reichmann,
By Dyrenforth & Dyrenforth,
Att'ys.

UNITED STATES PATENT OFFICE.

JOSEPH REICHMANN, OF CHICAGO, ILLINOIS.

ELEVATOR-CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 532,583, dated January 15, 1895.

Application filed June 9, 1894. Serial No. 514,017. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH REICHMANN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Elevator-Controlling Devices, of which the following is a specification.

My invention relates to means for controlling the motive power of elevators from a moving car or platform.

The object of my invention is to provide means to travel with the car, whereby the operator on the car may control the elevator by shifting the controlling cable directly by hand, or by suitable mechanism.

To this end my invention consists in the combination, with an elevator car or platform, of a rope or cable passing around sheaves above and below the plane of travel of the car, and forming four lines or lengths between the top and bottom sheaves, whereby two of the rope or cable lines shall travel with the car, one at a time of which the operator may shift directly by hand, or by means of suitable mechanism traveling with the car, to control the elevator.

My invention consists further in the more specific construction and arrangement of parts of my improved device, all as hereinafter more fully set forth.

Referring to the accompanying drawings, Figure 1 is a broken view in front elevation, showing that portion of an elevator provided with my improvement. Fig. 2 is a similar view illustrating my improvement in modified form. Fig. 3 is a broken sectional front view of modified mechanism for operating the cable; and Fig. 4 is a sectional side view of the same. Fig. 5 is a broken view in front elevation of mechanism for operating the cable. Fig. 6 is a broken view showing the top sheaves in front elevation; and Fig. 7 is a plan view of the same. Fig. 8 is a plan view of the operating lever. Fig. 9 is a broken view in elevation showing a modification. Fig. 10 is a broken sectional view of parts shown in Fig. 2, but enlarged over the scale observed in the last-named figure.

In Fig. 1, A represents the car adapted to be raised and lowered by the hoisting cable B.

C is the controlling cable.

The lever or beam D is pivotally secured at the lower end of the elevator-shaft, and is provided with a connection E′ to the apparatus to be operated, and with the sheaves E and F at the opposite sides of its fulcrum, which sheaves are provided with grooves for the controlling cable, and revolve freely on their bearings in a parallel line with the plane of the side of the car.

The sheaves G and H near the top of the elevator-shaft are preferably arranged diagonally with relation to the elevator-shaft indicated by the reference S, as shown in Fig. 7. The object is to prevent the crossing of the controlling-cable lines c^2 and c^4 below the sheaves, and thereby their contact with each other. These sheaves are provided with grooves for the controlling cable, and are secured to the frame I (Fig. 6), where they revolve freely on their respective bearings. The frame I is secured to the beam I′ by means of the angle iron I^2 (Fig. 7) fastened to the beam I′ by bolts I^3, and is adapted to slide freely upward and downward the distance of the slots *r* in the frame, and is supported by a lever I^4 which is pivotally secured to the beam I′, and provided with the weight I^5. The controlling cable C is rigidly attached to the car by the clamp A′, and, passing around the sheaves E and G, forms the line *c*′, between the sheaves E and G; and passing around the sheave F forms the line c^2, between the sheaves G and E; and passing around the sheave H forms the line c^3, between the sheaves F and H; and passing around the sheave E forms the line c^4, between the sheaves H and E.

The controlling cable C forms one continuous line of cable, though its ends may terminate at the car, and they may be secured to the car by the usé of the additional clamp A^2 shown in dotted lines, in which case the car forms a link in the continuous cable. The line c^3 is accessible to the operator on the car, and should be provided with the usual button or collar for shifting the cable, but the shifting of the cable may also be performed by the operator, by applying his hand to the bare cable, or the cable may be provided for a sufficient portion of its length with suitable wrapping. The cable, owing to the diagonal position of the sheaves G and H shown in Fig. 7, is retained to a certain de-

gree from the axial line of the travel of the car, whereby the cable tends to jump the sheaves. I avoid this by adjusting the weight I^5 on the lever I^4 to force the frame I and with it the sheaves G and H upward, and thereby secure sufficient tension in the controlling cable to prevent the same from jumping the sheaves.

In Fig. 2, A represents the car, which is provided with the hoisting cable B, and the controlling cable C. The lever or beam D is pivotally secured at the lower end of the elevator-shaft, and is provided with the connection D′ and the sheaves E and F in the manner described with relation to Fig. 1, to revolve in a parallel line with the plane of the side of the car.

The sheaves G, H and H′ near the top end of the elevator-shaft are of usual construction, and revolve freely on their bearings. The sheaves G and H are secured to the beam I′, the sheave H′ being preferably secured to the lever I^4, which is pivotally secured to the beam I′ and provided with the weight I^5, which may be adjusted to secure the tension desired on the controlling-cable; but the bearing of the sheave H′ may also be secured to the beam I′ in a fixed position.

The controlling cable C is attached to the car by the clamp A′, and passing around the sheaves E and H′ forms the line c^4, between the sheaves E and H′; and passing around the sheave G forms the line c', between the sheaves E and G; and passing from sheave G around the sheave H and the sheave F forms the line c^3; and passing from sheave F around the sheave H′ the line c^2 is formed.

The controlling cable may form one continuous line of cable, but it may also terminate at the car, with its ends secured to the car by the use of the additional clamp A^2 shown dotted in Fig. 2 whereby the cable is united by the car forming a link in the same.

The car A is provided with the slot L′ which serves as a guide for the handle L, and is provided with a rack for retaining the handle in position. The handle L slides freely upward and downward in the slot or guide L′, and is provided with a pawl (as shown in Fig. 10) to retain the handle in position by engaging the teeth of the rack. The handle L is arranged in convenient position for the operator in the car and extends through the slot L′ to the outside of the car, where it forms a clamp for the controlling cable c^3, as indicated in Fig. 2. The cable line c^3 is thus secured to the handle L and the line c^4 to the car.

Figs. 5 and 8 represent mechanism traveling with the car for shifting the controlling cable. The lever M is pivotally secured to the car A by the hanger M′ and is provided with a latch which is adapted to enter into the notches of the quadrant M^2 for retaining the lever in position in the usual manner. The lower end of the lever M is extended on the opposite sides of its fulcrum, and is provided with the swivel-clamp M^3 for the controlling cable, and with the weight M^4 at the opposite side of the fulcrum for balancing the lever. The sheave and cable arrangement is the same as described in connection with Fig. 1. The controlling cable forms lines c', c^2, c^3 and c^4. The line c' is secured to the car by clamp A′, and cable line c^3 is secured to the lever by the clamp M^3. By moving the lever M from the neutral position, the cable line c^3 will also be shifted an equal distance in the same direction.

Figs. 3 and 4 also represent mechanism traveling with the car for shifting the controlling cable. The lever N is pivotally secured to the car A by the hanger N′ in which it turns freely, and is provided with the usual latch and quadrant for retaining the lever in position. To the lever N is rigidly secured the drum N^2, around which the cable line c' is coiled and secured to the drum by the clamp N^3, to form a direct line, whereby, when the lever N is shifted from its neutral position toward the position N^4, the cable line c' will be raised; and if moved toward the position N^5 the cable line c' will be lowered. The cable line c^3 is rigidly secured to the car A by a clamp (not shown) in the manner that the cable-line c' is attached to the car by the clamp A′. The controlling cable passes around the sheaves at both ends of the elevator-shaft, as shown in Fig. 1, and forms the lines of cable c', c^2, c^3 and c^4.

The operation is as follows: The device shown by Figs. 1 and 6 is in the neutral position, and the car A is stationary. By raising the cable line c^3 the line c^4 is lowered, thereby raising the sheave F and lowering the sheave E owing to the shortening of the cable line c^3 and the lengthening of the cable line c^4. This imparts a shifting motion to the lever D and the connection D′ and to the apparatus to be operated, whereby the car will rise. When it is desired to stop the motion of the car, the cable line c^3 is lowered, thereby raising the cable-line c^4, and shifting the lever D with its connection to the neutral position, owing to the shortening of the cable-line c^4 on one side, and the lengthening of the cable line c^3 on the opposite side of the fulcrum of the lever D, and the motion of the car is thus stopped. In case the car is to descend, force is again applied to the cable-line c^3 in a downward direction, to cause the lengthening of the cable-line c^3 and shortening of the cable-line c^4, whereby pulling force is applied to the sheave E while the sheave F will yield. This shifts the lever D with its connection in the corresponding direction, and causes the descending motion of the car, which motion is stopped by raising the cable-line c^3 to the neutral position.

The following is the operation of the device represented by Fig. 2, and as shown is in the neutral position with the car A stationary: When it is desired to have the car ascend, the operator removes the pawl of the handle L

from the notch, and raises the handle and with it the cable-line c^3, and the lever D with its connections is shifted by the shortening of the cable-line c^3 and the lengthening of the cable-line c' to cause the car to rise; and the handle L may be retained in any position desired, by permitting the pawl to engage the rack. To stop the motion of the car, the handle L is returned to its former position, and the lever D with its connection is shifted to the neutral position by the lengthening of the cable-line c^3, and the shortening of the cable-line c' to stop the motion of the car. To cause the car to descend, the handle L is shifted downward and with it the cable-line c^3, thereby causing shifting of the lever D with its connection in the corresponding direction, by the lengthening of the cable-line c^3 and the shortening of the cable-line c' to cause the car to descend, and the motion of the car is stopped by shifting the handle L to the neutral position.

In case the car A is provided with mechanism as shown by Figs. 5 and 8 for the shifting of the controlling cable, the operator shifts the lever M from the neutral position toward M^5 to cause the ascent of the car and returns the same to the neutral position to stop the motion of the car, and shifts the lever toward M^6 to cause the descent of the car, which motion is again stopped by shifting the lever to the neutral position.

By applying mechanism on the car, shown in Figs. 3 and 4, the operator shifts the lever N toward the position N^5 to cause the ascending of the car, whereby the cable-line c' is lowered, and the cable-line c^2 raised, thus also raising the sheave F and lowering the sheave E, and as a consequence shifting the lever D with its connection to cause the upward motion of the car; which motion is stopped by returning the lever to the neutral position, from which it may be shifted toward the position N^4 to cause the descent of the car, whereby the cable-line c' is raised and the cable-line c^2 is lowered, shifting the sheaves E and F with lever D and its connection in the corresponding direction, to cause the downward movement of the car.

In the device, as previously described, one of the cable-lines is rigidly secured to the car, and one of the cable-lines is adapted to be shifted by the operator on the car. By the use of a continuous cable, the device may be so arranged that either one of the cable-lines traveling with the car may be shifted by the operator on the car. By omitting the clamp A′ and arranging the cable and the sheaves, as shown in Fig. 1, each of the cable-lines c^2 and c^4 may be provided with a handle as shown in Figs. 2 and 10 and arranged in convenient position for the operator for the alternate control of either handle. In that case the operator raises one handle and the cable c^2, while the other handle and cable c^4 are retained in their position by means of the pawl. This shortens the cable-line c^2 and lengthens the line c', whereby the car will rise; and by returning the handle on c^2 to the neutral position the motion of the car is stopped and the handle is locked by the pawl and retained in its position. By raising the handle and cable c^4, the cable c^4 is shortened and the cable c^3 is lengthened, whereby the car will descend, and its movement is stopped by the return of the handle to its neutral position.

By the use of a continuous cable the device may also be so arranged that either one of the cable-lines traveling with the car shall alternately be shifted by the operator on the car by moving but one handle. Fig. 9 represents this device, which is a front view in elevation, and is diagrammatic in its character. The three armed lever O on the car is pivotally connected to the bars O′ and O^2, which slide freely up and down in suitable guides. They extend to the outside of the car and are provided with clamps for connecting the cable-lines c' and c^3 therewith, whereby the cable-lines may be shifted a sufficient distance. The continuous cable passes around the sheaves at both ends of the elevator shaft, as shown in Fig. 1, and forms the cable lines c', c^2, c^3 and c^4, as described. The bars O′ and O^2 are normally supported on the car, as shown, whereby, depending on the direction of shifting the lever O, one or the other of the bars will serve as the fulcrum of the lever for the raising of the other and with it the cable-line. By shifting the lever O from the neutral position to o^3, the bar O^2 is supported on the car and serves as the fulcrum for the lever to raise the cable-line c^3, and causes the ascending motion of the car, which motion is stopped by returning the lever to its neutral position. By shifting the lever to the position o^4, the bar O′ serves as the fulcrum of the lever, and the cable-line c' is raised and causes the descending motion of the car, which is stopped by shifting the lever to its neutral position.

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

1. The combination with the car, of an elevator controlling device having sheaves at the opposite ends of the elevator shaft, a lever, sheaves E and F mounted on opposite sides of the fulcrum of said lever, the cable C secured to the car and passing around the sheaves above and below the travel of the car, and forming four lines between said shaft-sheaves, and the starting and stopping mechanism operative by said cable by shifting a single cable-line thereof traveling with the car, substantially as set forth.

2. The combination with the car, of an elevator controlling device having sheaves at the opposite ends of the elevator shaft, the lever D connected with the starting and stopping mechanism, the sheaves E and F mounted on opposite sides of the fulcrum of the lever D parallel to the plane of the side of the car, the cable C secured to the car, and passing around the sheaves above and below the travel of the car and forming four lines be-

tween said shaft-sheaves, and the starting and stopping mechanism controllable by said cable by shifting a single cable-line thereof traveling with the car, substantially as set forth.

3. The combination with the car, of an elevator controlling device having sheaves at the opposite ends of the elevator shaft, the lever D, the sheaves E and F mounted on opposite sides of the fulcrum of said lever, the lever I^4 and the weight I^5 secured thereto, the cable C secured to the car and passing around the sheaves above and below the travel of the car, and forming four lines between said shaft-sheaves, and the starting and stopping mechanism controllable by said cable by shifting a single cable line thereof traveling with the car, substantially as set forth.

4. The combination with the car, of an elevator controlling device having sheaves at the opposite ends of the elevator shaft, a lever and the sheaves E and F mounted on opposite sides of the fulcrum thereof, the cable C detachably secured to the car and passing around the sheaves above and below the travel of the car and forming four lines between said shaft-sheaves, two of which travel with the car, and the starting and stopping mechanism operative by the said cable, by alternately shifting either one of the cable lines thereof traveling with the car, substantially as set forth.

JOSEPH REICHMANN.

In presence of—
M. J. FROST,
W. U. WILLIAMS.

Patent No. 532,583.

Correction in Letters Patent

It is hereby certified that in Letters Patent No. 532,583, granted January 15, 1895, upon the application of Joseph Reichmann, of Chicago, Illinois, for an improvement in "Elevator-Controlling Devices," an error appears in the printed specification requiring the following correction, viz: On page 1, line 54, the reference letter "E′" should be *D′;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 19th day of February, A. D. 1895.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR.
Commissioner of Patents.