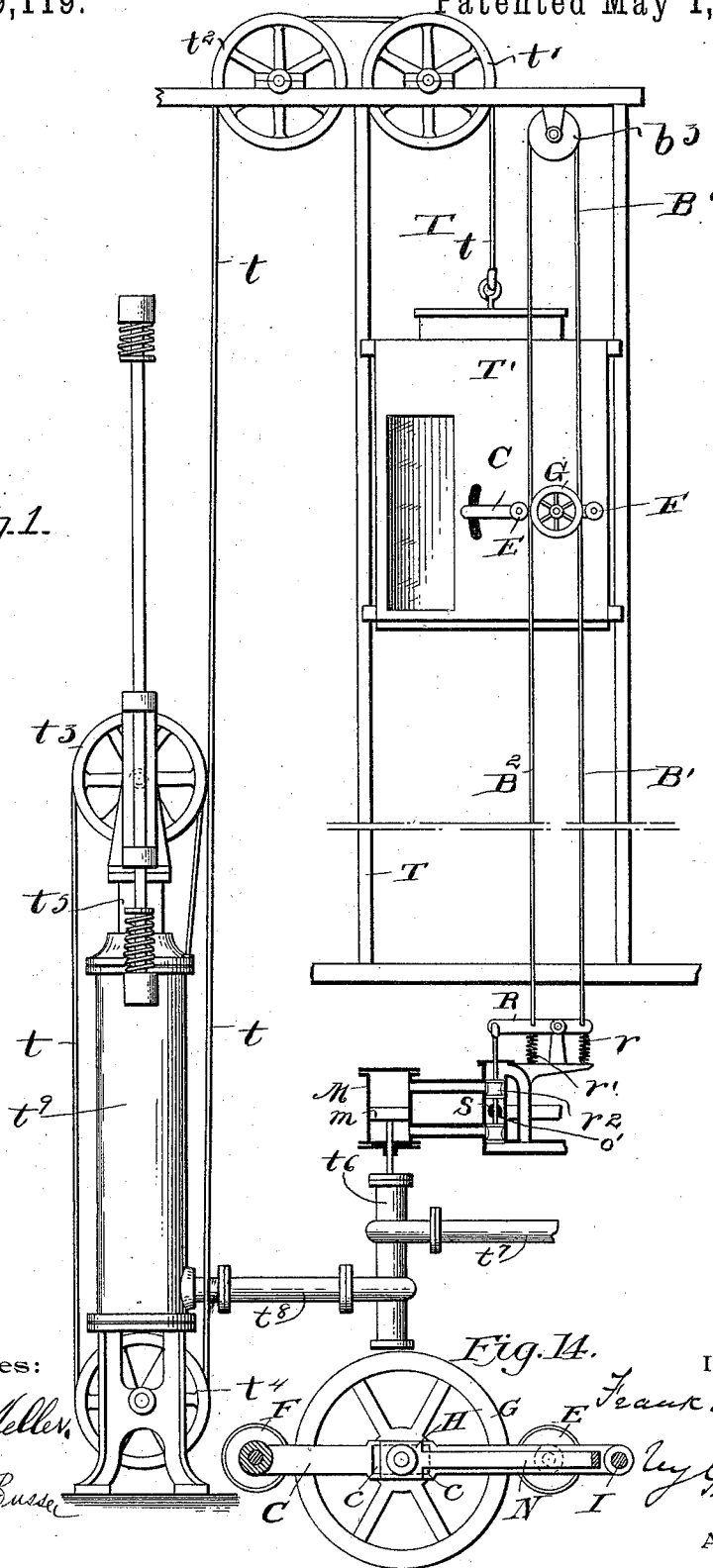


F. E. HERDMAN.
ELEVATOR CONTROLLING DEVICE.

No. 519,119.

Patented May 1, 1894.

Fig. 1.



Witnesses:

Jesse B. Heller.
Francis Busse.

Fig. 14.

Inventor.

Frank E. Herdman

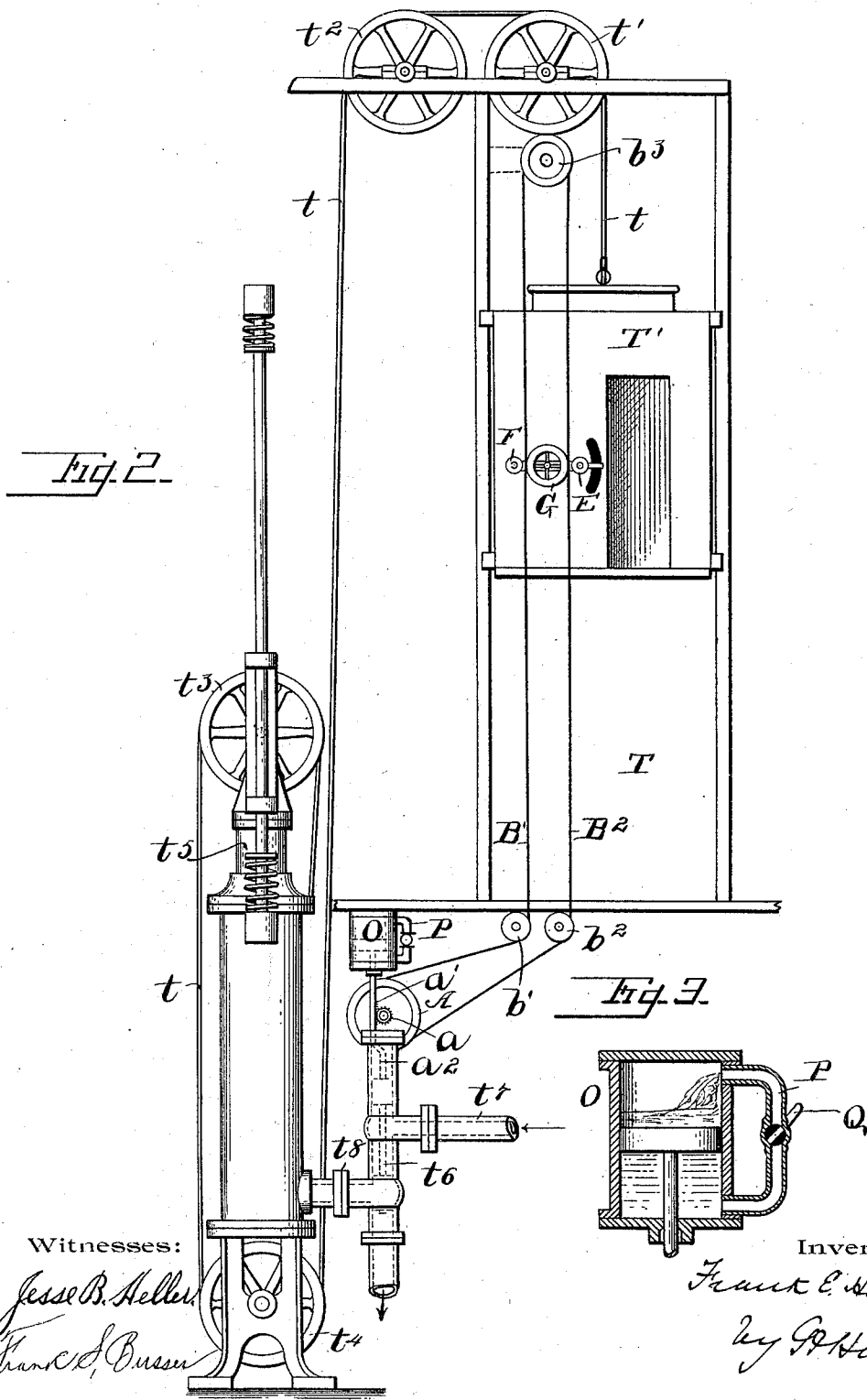
By G. Harding

Attorney.

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Fig. 4.

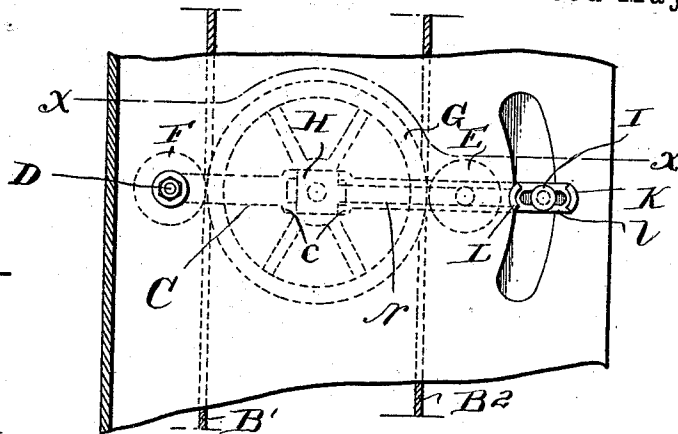


Fig. 5.

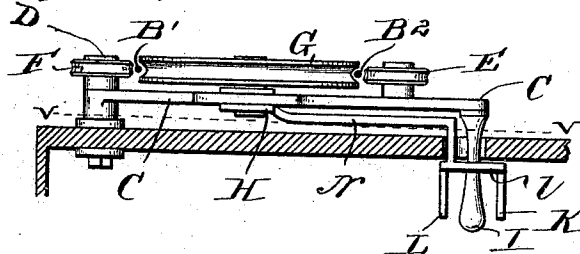


Fig. 6.

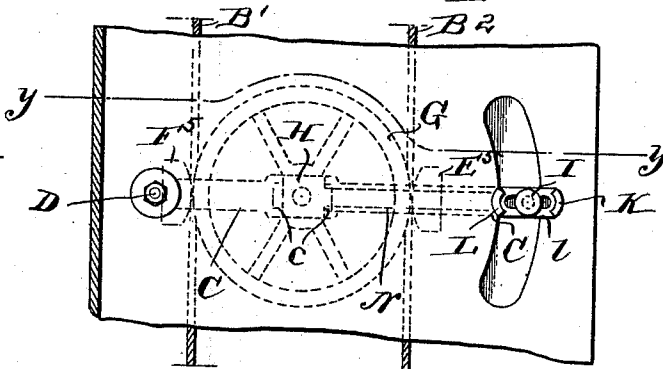
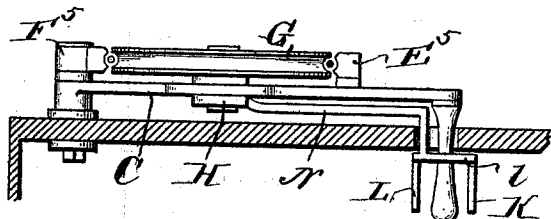


Fig. 7.



Witnesses:

Jesse B. Heller.
Frank S. Busser

Inventor.

Frank E. Herdman
by G. P. Harding
Attorney.

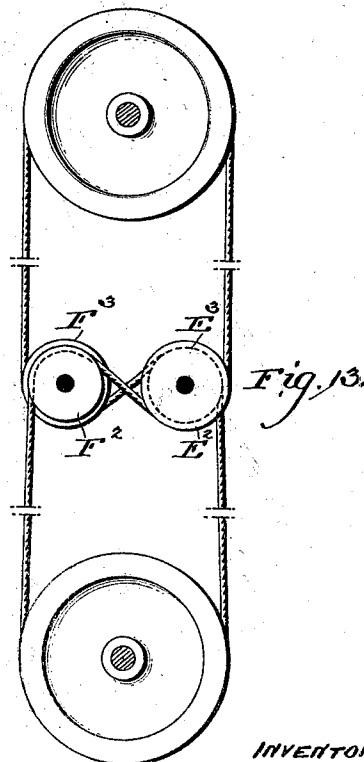
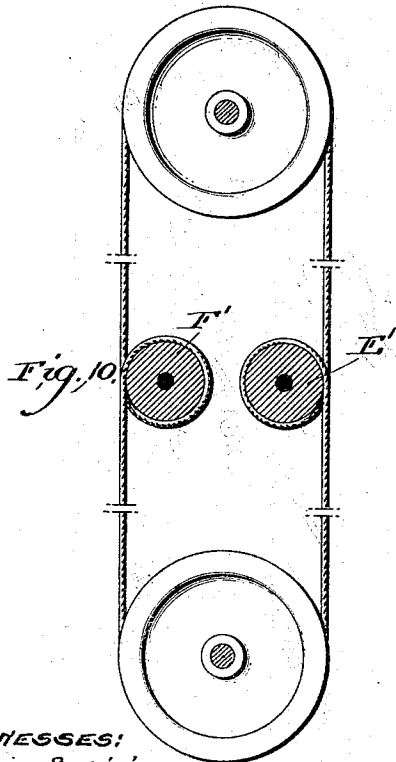
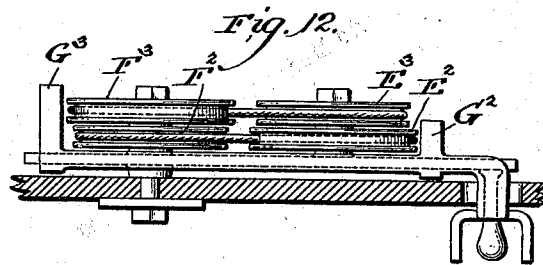
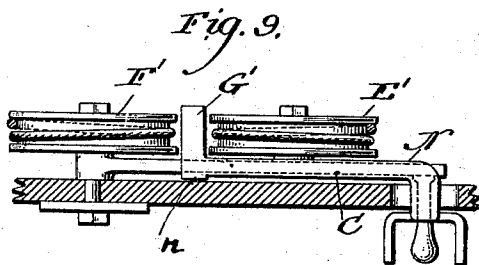
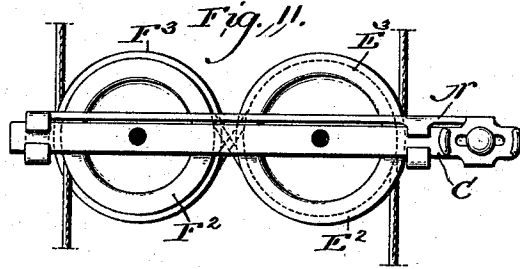
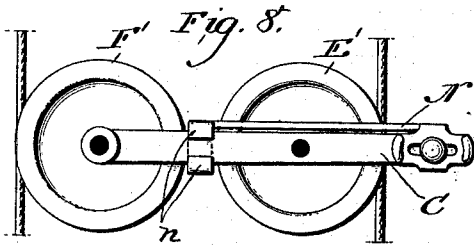
(No Model.)

4 Sheets—Sheet 4.

F. E. HERDMAN.
ELEVATOR CONTROLLING DEVICE.

No. 519,119.

Patented May 1, 1894.



WITNESSES:
David S. Williams,
Frank S. Bussan

INVENTOR:
Franc E. Herdman
by *W. H. Hendrix*

UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF WINNETKA, ILLINOIS.

ELEVATOR CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 519,119, dated May 1, 1894.

Application filed November 22, 1893. Serial No. 491,626. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. HERDMAN, a citizen of the United States, residing at Winnetka, county of Cook, and State of Illinois, have invented a new and useful Improvement in Elevator Controlling Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide ready means in the car and connected with the elevator operating mechanism, which will be readily controlled by the operator.

In the drawings:—Figure 1 is a front elevation partially in section of a portion of the elevator operating mechanism and the elevator controlling mechanism. Fig. 2 is a modified form of the same. Fig. 3 is a detail view of portion of Fig. 2. Fig. 4 is an enlarged front elevation of a portion of the car showing the lever and friction devices for operating the cable. Fig. 5 is a section on the line $x-x$ of Fig. 4. Fig. 6 is a view similar to that shown in Fig. 4 showing modified form of friction devices. Fig. 7 is a section on the line $y-y$, Fig. 6. Fig. 8 is a view similar to that of Fig. 4, showing a modified arrangement of friction devices. Fig. 9 is a plan view of the arrangement shown in Fig. 8. Fig. 10 is a diagram showing the course of the cables with relation to the arrangement of friction devices shown in Figs. 8 and 9. Fig. 11 is a view similar to that of Fig. 4, showing another modified arrangement of friction devices. Fig. 12 is a plan view of the arrangement shown in Fig. 11. Fig. 13 is a diagram showing the course of the cables with relation to the arrangement of friction devices shown in Figs. 11 and 12. Fig. 14 is a sectional view on the line $v-v$, Fig. 5.

T is the elevator shaft; T' the elevator car; t the lifting cable which passes round the sheaves, t^1 , t^2 , around the fixed pulley t^4 and then around the sheave t^3 upon the operating piston t^5 .

t^6 is the valve controlling the admission of the fluid to the operating cylinder t^8 .

t^7 is the inlet from the fluid source to the valve, and t^8 the pipe leading from the valve t^6 to the cylinder.

B' B^2 are the operating cables which pass up the shaft T beside the car T' and around the fixed sheave b^3 at the top of the shaft T . On the outside of the car is placed the lever C shown in detail in Figs. 4, 5, 6 and 7. This lever is pivoted at D , and connected at its pivot point with the car, and on this same pivot is placed the wheel F . At the other end of the lever C is placed the wheel E . The wheel F is on the outside of the cable B' , and the wheel E is on the outside of the cable B^2 . Between these two wheels the lever C is slotted at c , and a block H has a bearing adapted to slide in said slot. To this sliding block is pinned the sheave G . This sheave is between the two wheels E and F , and, as may be clearly seen in the detail figures, is flanged. The position of these sheaves is such that the cables B' and B^2 are free from the sheave G when the sheave is in its central position. To the sliding block H is attached the arm N bent, as shown in Figs. 5 and 7, the bent portion of arm N passing through a slot in the frame of the elevator car, and having the plate l , projecting from which plate l are the handles K and L . Through this same slot and through a slot in the plate l , a handle I , attached to the lever C , passes. The cables B' and B^2 may be connected with the operating mechanism in various ways. I have shown two. In Fig. 1, I have shown it connected to a lever R , having on each side of its fulcrum point springs r , r' . This lever is connected with the piston of the piston valve S , which has the inlet port o' , and ports leading to the cylinder M , one on each side of the piston m . In said cylinder M this piston m is connected with the valve t^6 . By this arrangement the main valve t^6 is operated by the piston in cylinder M , which is controlled by the piston valve S , thereby relieving the operating cables, B' and B^2 , of the work of operating valve t^6 . In place of connecting the cables B' and B^2 with the auxiliary valve in the manner just described, the cables B' and B^2 can be connected, as shown in Fig. 2, in which case the cables pass around the sheave A , upon the shaft of which is a pinion, a , which works in the rack, a' , on the valve stem a^2 of the main valve t^6 . To prevent the valve t^6 from operating too quickly, I attach to the valve a pis-

ton contained in the cylinder O. The upper side and under side of this cylinder are connected by pipe P, containing a cock Q. This cock opens in both directions, and in consequence of the movement of the valve, requiring the contents of one side of this cylinder to be forced to the other, the greatest speed at which the valve can be operated can be nicely adjusted by adjusting the cock Q. In order to operate the mechanism with either one of these connections, suppose the elevator to be at rest and the operator desires to cause the same to ascend; the operator grasps the handles I and L and forces the handle L toward the handle I, which moves the sheave G toward the sheave E, clamping the cable B² between the sheaves G and E. After clamping, the handle I is moved upward in the slot, as shown in dotted lines, thereby elevating the sheaves G and E and lifting up the cable B², opening the valve V, and as soon as the elevator starts the mere clamping of the cable B² between the sheave G and the wheel F still further opens the valve or operating mechanism by means of the movement of the car upward. When the operator has attained the speed desired, he relieves the handle L and allows the cable B² to pass freely, when the elevator continues at that speed. If he desires to stop, he grasps the handle K with the handle I and clamps the cable B' between the sheave G and the wheel F. As the cable B' operates the operating mechanism in the opposite direction to the cable B² then, owing to the motion of the car, the mere clamping of the cable B' operates the operating mechanism to stop the supply and stop the elevator. To descend the operator grasps the handles I and L in the same manner as heretofore described, in ascending, but pushes the lever C downward to start the elevator, when to increase the motion or stop it he operates it as before described for stopping when ascending.

In place of the wheels E and F, blocks E⁵ and F⁵ can be attached to the lever C, as shown in Figs. 6 and 7, the cables being allowed to slide in their blocks, and if desired even the sheave G may be replaced by a block.

In Figs. 8, 9 and 10, I have shown the operating cables wound around sheaves E' and F' corresponding respectively to the sheaves E and F of Fig. 4. The lever C is not slotted, while a flange n on the arm N has a bearing on the lever C and is adapted to slide thereupon. In this arrangement, the sheaves E' and F' are of course loosely journaled and the operating cables instead of touching them tangentially, passes once around each of them. Consequently the travel of the car will cause the sheaves E' and F' to revolve. This arrangement permits the substitution for the large intermediate pulley G of a small friction block G'. To start the car, the friction block, which is operated precisely as is the large intermediate sheave of Fig. 4, is brought in tight contact with the flanges of the sheave E', and the lever thrown in the direction in

which the operator desires to start the car. This will draw up the cable and operate the valve. In stopping, the friction block is simply brought in contact with the revolving sheave F', thereby checking its motion and thus stopping the cable.

In Figs. 11, 12 and 13, I show two pairs of sheaves, the sheaves of each pair being mounted on a common axis. The operating cable, as Fig. 13 will show, in its downward extension passes under one sheave, E² of one pair, and over one sheave F² of the other pair, while on its return it passes over the remaining sheave E³ of the first named pair, and under the remaining sheave, F³ of the other pair. Obviously, the friction block cannot be located in this construction between the pairs of sheaves, owing to the crossing of the cable. Instead there are two friction blocks located respectively at opposite ends of the lever N'. By bringing block, G³, in contact with sheave E² and block G³ in contact with sheave F³, the elevator can be controlled in the manner before described. To prevent either friction block from clamping more than one of the corresponding pair of pulleys, the pulleys, E² and F³ may be made larger than pulleys, E³ and F², as illustrated.

The devices hereinbefore described may be modified, and still embody my invention, although the preferable constructions are those which I have described.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with the elevator operating mechanism and car of operating cables, connection between said cables and the operating mechanism, a lever, friction devices upon said lever adjacent to which the cables pass, said lever being slotted, a friction device having a bearing adapted to move in said slot and adjacent to which said cables pass, and an arm connected to said friction device, substantially as described.

2. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and operating mechanism, a lever, friction devices upon said lever adjacent to which the cables pass, said lever being slotted, a block in said slot, a friction device connected to said block adjacent to which the said cables pass, and an arm connected to said block, substantially as described.

3. The combination with the elevator operating mechanism of operating cables, connection between said cables and the operating mechanism, a lever, wheels on said lever adjacent to said cables, said lever being slotted, a wheel having a bearing adapted to move in said slot, said wheel being adjacent to said cables, and an arm connected to said wheel, substantially as described.

4. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and the oper-

ating mechanism, a lever, wheels on said lever, adjacent to said cables, said lever being slotted, a block in said slot, a wheel upon said block and an arm connected to said block, substantially as described.

5 5. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and the operating mechanism, a lever, friction devices
10 upon said lever adjacent to which the cables pass, said lever being slotted, a friction device having a bearing adapted to move in said slot and adjacent to which said cables pass, and an arm connected to said friction
15 device, said arm being bent and passing through a slot in the car, and provided with a bifurcated end, and said lever provided with a handle passing through said slot, substantially as described.

20 6. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and operating mechanism, a lever, friction devices upon said lever adjacent to which the cables
25 pass, said lever being slotted, a block in said slot, a friction device connected to said block adjacent to which the cables pass, and an arm connected to said block, said arm being bent and passing through a slot in the car and
30 provided with a bifurcated end, and said lever being provided with a handle passing through said slot, substantially as described.

7. The combination with the elevator operating mechanism of operating cables, connection
35 between said cables and operating mechanism, a lever, wheels on said lever adjacent to said cables, said lever being slotted, a wheel having a bearing adapted to move in said slot, said wheel being adjacent to said cables, and
40 an arm connected to said wheel, said arm being bent and passing through a slot in the car and provided with a bifurcated end, and said lever being provided with a handle passing through said slot, substantially as described.

45 8. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and operating mechanism, a lever, wheels on said lever adjacent to said cables, said lever being slotted,
50 a block in said slot, a wheel connected to said block, an arm connected to said block, said arm being bent and passing through a slot in the car and provided with a bifurcated end, and said lever being provided with a
55 handle passing through said slot, substantially as described.

9. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and the operating
60 mechanism, a lever carried by the car, friction devices upon said lever adjacent to said cables, and a friction device having a bearing adapted to move along and with said lever, substantially as described.

65 10. In combination with the elevator operating mechanism and car, operating cables, connection between said cables and the oper-

ating mechanism, a lever carried by the car, wheels upon said lever adjacent to said cables, and a wheel adapted to move along and with
70 said lever, substantially as described.

11. The combination with the elevator operating mechanism, comprising an operating cylinder valve an elevator car, and operating
75 cables, of a controlling device consisting of a lever, friction devices upon said lever adjacent to which the cables pass, said lever being slotted, a friction device having a bearing adapted to move in said slot and adjacent to
80 which said cables pass, an arm connected to said friction devices, and connection between said controlling device and said valve for regulating the speed of the movement of said valve, substantially as described.

12. The combination with the elevator operating mechanism, comprising an operating
85 cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, friction devices upon said lever adjacent to which the cables pass, said lever being
90 slotted, a block in said slot, a friction device connected to said block adjacent to which the said cables pass, and an arm connected to said block; and connection between said controlling device and said valve for regulating
95 the speed of the movement of said valve, substantially as described.

13. The combination with the elevator operating mechanism, comprising an operating
100 cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, wheels on said lever adjacent to said cables, said lever being slotted, a wheel having a bearing adapted to move in said slot, said wheel being adjacent to said cables, and
105 an arm connected to said wheel, and connection between said controlling device and said valve for regulating the speed of the movement of said valve, substantially as described.

14. The combination with the elevator operating mechanism, comprising an operating
110 cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, wheels on said lever, adjacent to said cables, said lever being slotted, a block in
115 said slot, a wheel upon said block and an arm connected to said block, and connection between said controlling device and said valve for regulating the speed of the movement of said valve, substantially as described.

15. The combination with the elevator operating mechanism, comprising an operating
120 cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, friction devices upon said lever adjacent to which the cables pass, said lever being
125 slotted, a friction device having a bearing adapted to move in said slot and adjacent to which said cables pass, an arm connected to said friction device, said arm being bent and
130 passing through a slot in the car and provided with a bifurcated end, and said lever being provided with a handle passing through said slot, and connection between said con-

trolling device and said valve for regulating the speed of the movement of said valve, substantially as described.

16. The combination with the elevator operating mechanism, comprising an operating cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, friction devices upon said lever adjacent to which the cables pass, said lever being slotted, a block in said slot, a friction device connected to said block adjacent to which the cables pass, an arm connected to said block, said arm being bent and passing through a slot in the car and provided with a bifurcated end, and said lever being provided with a handle passing through said slot, and connection between said controlling device and said valve for regulating the speed of the movement of said valve, substantially as described.

17. The combination with the elevator operating mechanism, comprising an operating cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, wheels on said lever adjacent to said cables, said lever being slotted, a wheel having a bearing adapted to move in said slot, said wheel being adjacent to said cables, an arm connected to said wheel, said arm being bent and passing through a slot in the car and provided with a bifurcated end, and said lever being provided with a handle passing through said slot, and connection between said controlling device and said valve for regulating the speed of the movement of the said valve, substantially as described.

18. The combination with the elevator operating mechanism, comprising an operating cylinder valve an elevator car, and operating cables, of a controlling device consisting of a lever, wheels on said lever adjacent to said cables, said lever being slotted, a block in said slot, a wheel connected to said block, an arm connected to said block, said arm being bent and passing through a slot in the car and provided with a bifurcated end, and said

lever being provided with a handle passing through said slot, and connection between said controlling device and said valve for regulating the speed of the movement of said valve, substantially as described.

19. The combination with the elevator operating mechanism, an elevator car and operating cables, of a controlling device consisting of a lever carried by the car, friction devices upon said lever adjacent to said cables, a friction device adapted to move along and with said lever, and connection between said controlling device and said operating mechanism for regulating the speed of the movement of said operating mechanism in starting and stopping the same, substantially as described.

20. The combination with the elevator operating mechanism, an elevator car and operating cables, of a controlling device consisting of a lever carried by the car, wheels upon said lever adjacent to said cables, a wheel adapted to move along and with said lever, and connection between said controlling device and said operating mechanism for regulating the speed of the movement of said operating mechanism in starting and stopping the same, substantially as described.

21. The combination with the elevator operating mechanism and car, of operating cables, connection between said cables and the operating mechanism, a lever carried by the car, friction devices upon said lever adjacent to said cables, and another friction device adapted to move with said lever, said last named friction device and the friction devices upon said lever being adapted to have a relative movement toward each other, substantially as described.

In testimony of which invention I have hereunto set my hand.

FRANK E. HERDMAN.

Witnesses:

FRANK S. BUSSEY,
M. F. ELLIS.