

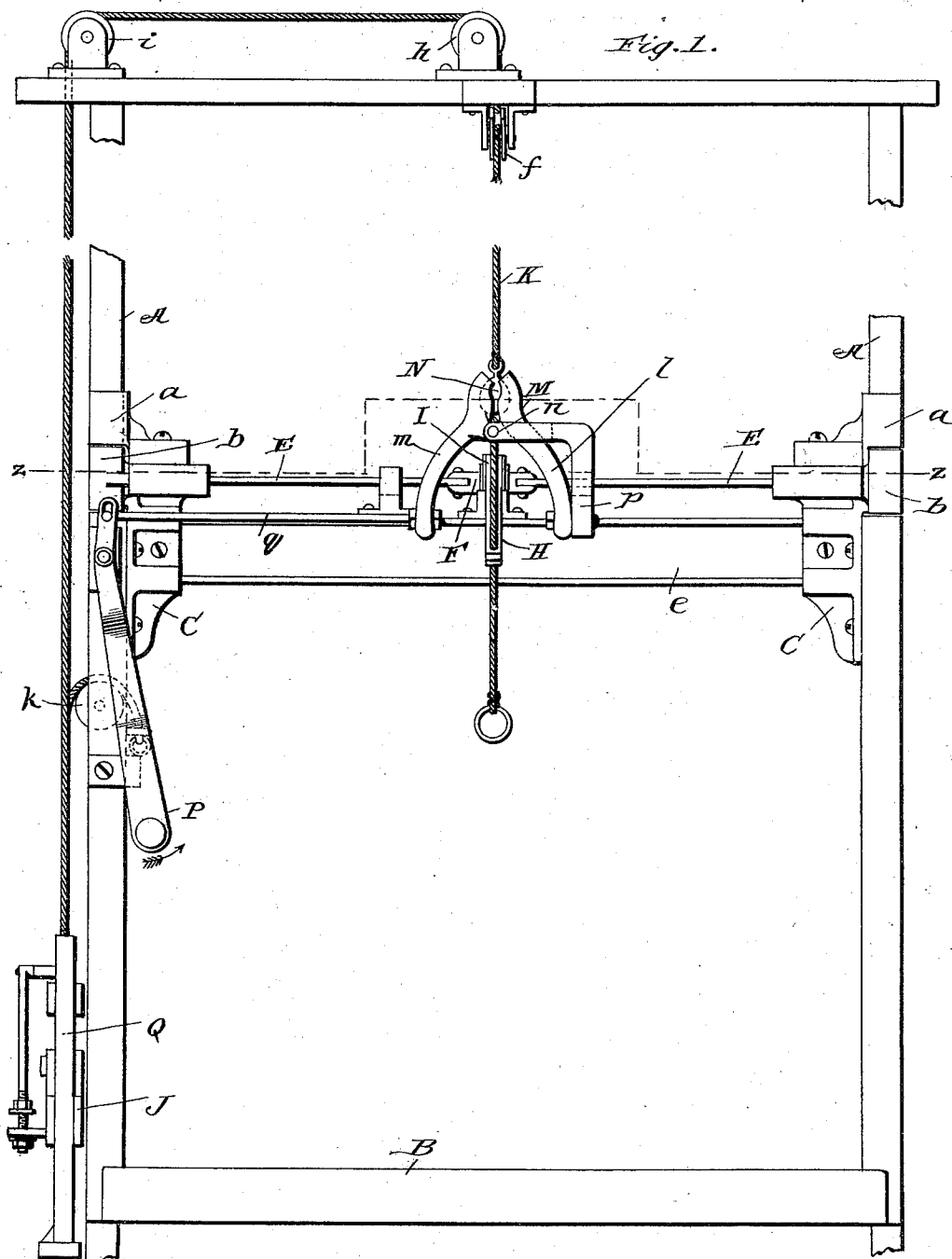
(No Model.)

4 Sheets—Sheet 1.

F. T. ELLITHORPE.
SAFETY DEVICE FOR ELEVATORS.

No. 535,095.

Patented Mar. 5, 1895.



Witnesses:

C. H. Raeder
W. H. Matthews.

Investor

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BY James J. Sherry
Attorney.

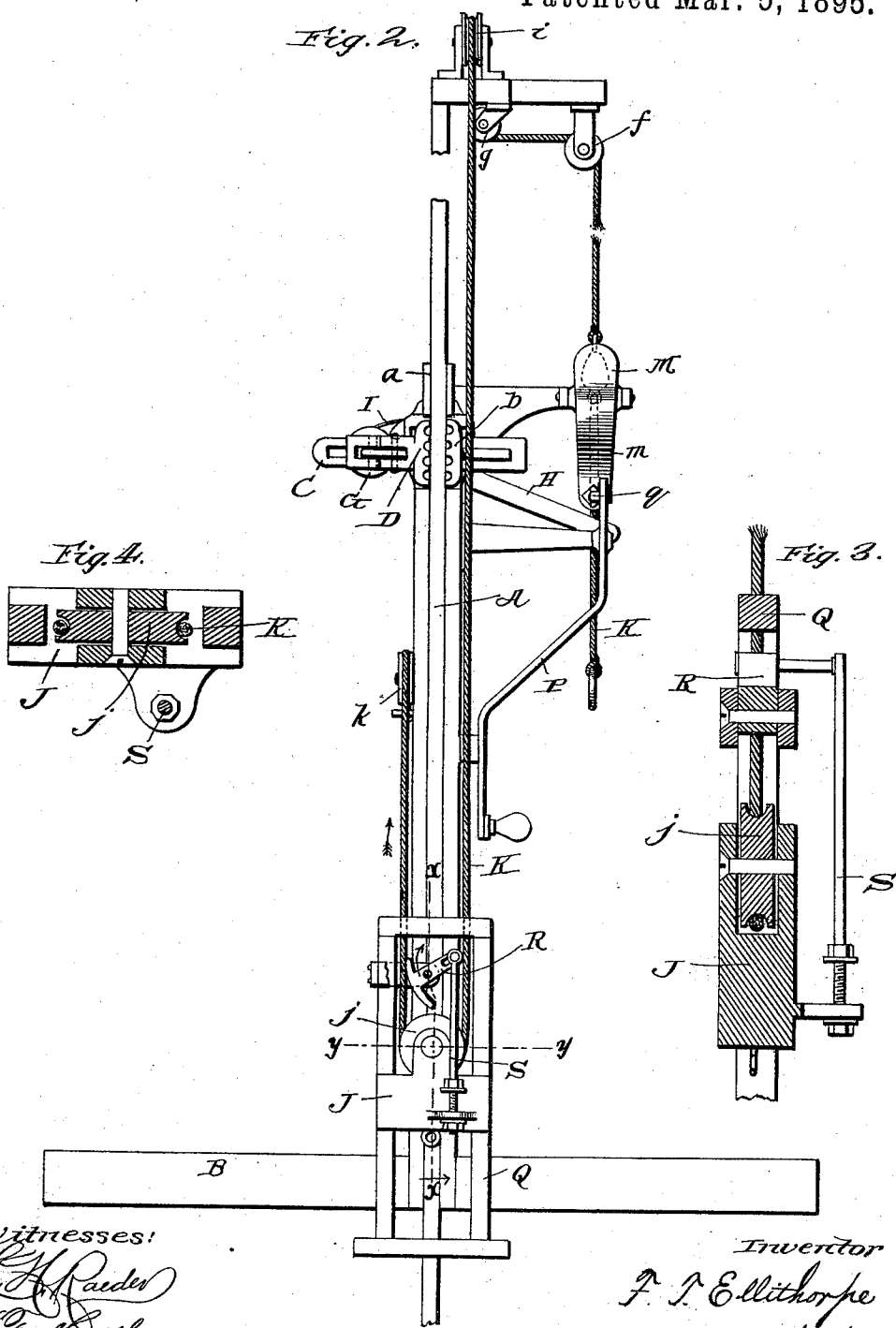
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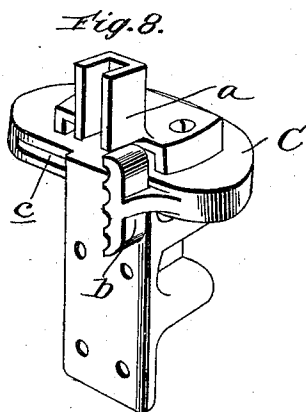
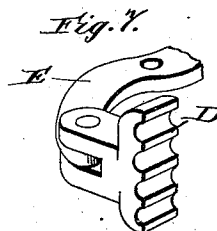
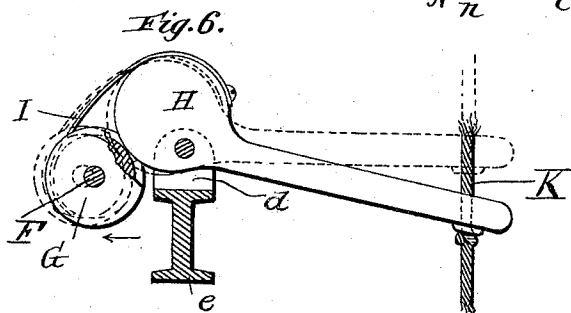
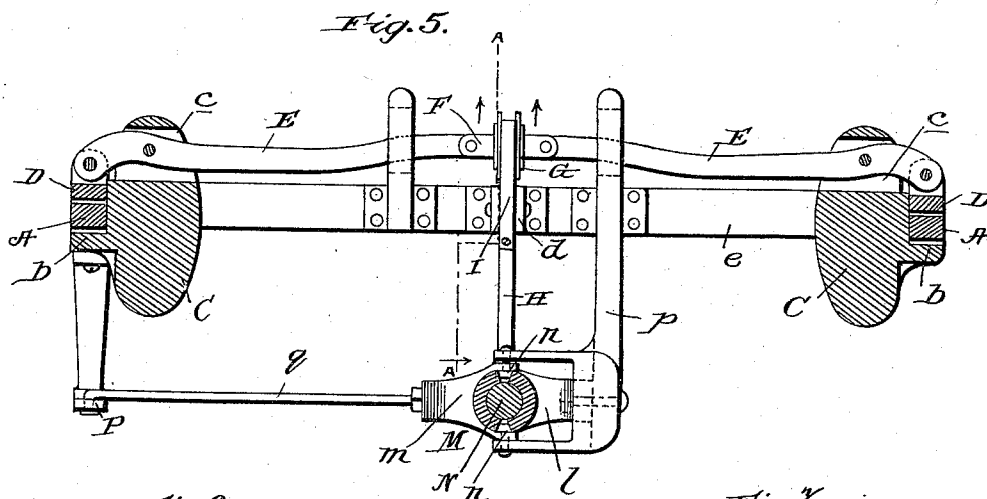
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4 Sheets—Sheet 3.

F. T. ELLITHORPE.
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Patented Mar. 5, 1895.



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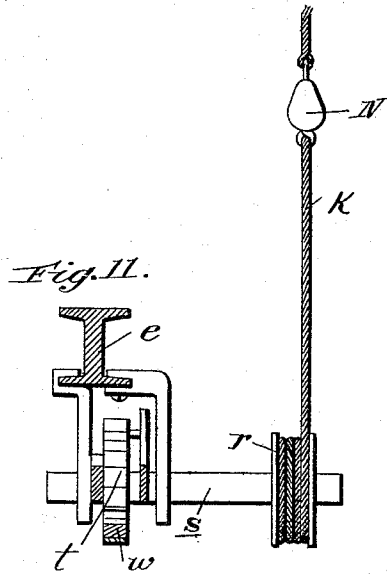
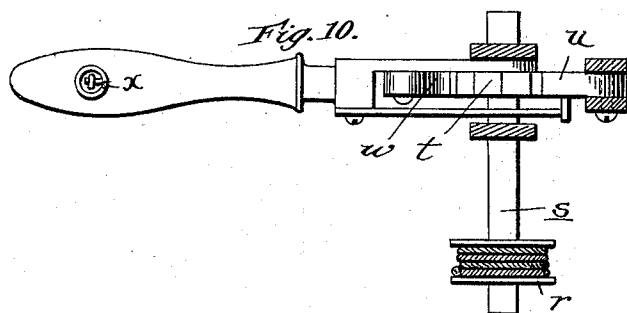
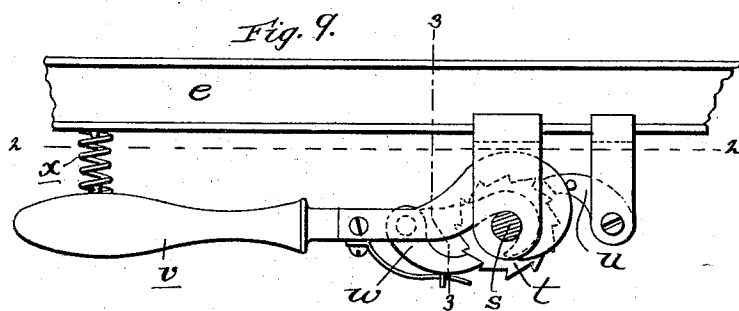
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4 Sheets—Sheet 4.

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SAFETY DEVICE FOR ELEVATORS.

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Patented Mar. 5, 1895.



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UNITED STATES PATENT OFFICE.

FREDERICK T. ELLITHORPE, OF NEWARK, NEW JERSEY.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 535,095, dated March 5, 1895.

Application filed December 17, 1894. Serial No. 532,081. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK T. ELLITHORPE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in safety devices for elevators; and it has for its general object to provide cheap, simple, and efficient means through the medium of which an elevator may be stopped and held against downward movement.

Another object of the invention is to provide means whereby the safety devices may be controlled and operated by the elevator attendant so as to enable him to stop the car when it is running away or for any other reason, and still another object is to provide means through the medium of which, the elevator attendant, without leaving the car may quickly and easily release the safety devices and return the several parts to their normal positions so as to permit of the car being raised or lowered when it has been stopped between the floors or at any other inconvenient point by the safety devices.

With the foregoing ends in view, the invention will be fully understood from the following description and claims, when taken in connection with the annexed drawings, in which—

Figure 1, is a front elevation, with parts broken away, illustrating a portion of an elevator equipped with my improvements. Fig. 2, is a side elevation of the same. Figs. 3 and 4, are detail sections taken in the planes indicated by the lines *x, x*, and *y, y*, respectively, of Fig. 2. Fig. 5, is a detail, horizontal section taken in the plane indicated by the line *z, z*, of Fig. 1. Fig. 6, is an enlarged detail section taken in the plane indicated by the line A—A of Fig. 5. Fig. 7, is a detail perspective view of one of the gripping jaws and a portion of the lever carrying the same. Fig. 8, is a perspective view of one of the guide castings removed from the elevator car. Fig. 9, is a side elevation of a modification which may be used to return the safety devices to their normal positions after they have been

operated to stop the car, and Figs. 10 and 11, are sections taken in the planes indicated by the lines 2, 2, and 3, 3, respectively, of Fig. 9.

In the said drawings, similar letters designate corresponding parts in all of the views, referring to which—

A, indicates the vertical ways or guides of an elevator.

B, indicates the elevator car.

C, indicates castings which are connected to the car at suitable points and are provided with slides *a*, adapted to engage the ways or guides A, and with portions *b*, designed to move at one side of the said guides; and D, indicates jaws or brake shoes which are designed to move on the opposite sides of the ways or guides A, with respect to the portions *b*, of the castings C. These jaws or brake shoes D, are pivotally or otherwise suitably connected to the ends of levers E; and said levers which are fulcrumed in slots *c*, in the castings C, are pivotally connected at their inner ends to an equalizing bar or link F, upon which is mounted a preferably flanged wheel G, designed to be engaged by the eccentric cam lever H, better illustrated in Fig. 6. The said lever H, which is, by preference, fulcrumed in lugs *d*, on the elevator beam *e*, normally rests in the position shown in Fig. 6, and therefore it will be seen that when the free end of the lever is raised, the wheel G, will be moved in the direction indicated by arrow (see Figs. 5, and 6), and through the medium of the levers E, the jaws or brake shoes D, will be forced against the guides or ways A, and the car will be stopped. Said jaws or brake shoes D, will be pressed against the ways or guides A, so long as the lever H, remains in the position shown by dotted lines in Fig. 6; and when said lever is lowered to the position shown by solid lines in said figure, the jaws or brake shoes will be drawn away from the guides or ways A, by the spring I, which is connected to the cam portion of the lever H, and the wheel G, as shown.

In order to move the free or power end of the lever H, upwardly and apply the brake shoes or jaws D, against the elevator guides, I provide the weight J preferably near the bottom of the elevator shaft J, (see Fig. 2,) and the cable K, which is connected to the lever H, as better shown in Figs. 1, and 6, and preferably passes around sheaves *f, g, h, i*, on a stationary beam preferably at the top of the

elevator shaft, around a sheave *j*, carried by the weight *J*, and over a sheave *k*, on the car to which it is connected at one end as shown in Fig. 1, and in order to hold the said cable *K*, so as to normally prevent the weight *J*, from raising the power end of the lever *H*, I provide a keeper *M*, on the car *B*, which keeper comprises the member *l*, and the member *m*, which are designed and adapted to engage a button or enlargement *N*, on the cable as better shown in Fig. 1. The keeper member *m*, is fulcrumed at *n*, upon a bracket *p*, or other suitable support and in order that the elevator attendant may quickly and easily move said member so as to release the cable *K*, I provide the lever *P*, which is carried by the car and is connected with the said keeper member *m*, by a link or other suitable connection *q*, as shown. When the keeper member *m*, is moved through the medium of the lever *P*, and connection *q*, and the cable *K*, is released as stated, the weight *J*, which is arranged in a suitable guide frame *Q*, in the elevator shaft will move downwardly and the free or power end of the lever *H*, will consequently be drawn upwardly and the brake shoes or jaws will be forced against the ways or guides *A*, as before described to stop the car.

R, indicates a brake shoe which is designed to engage the cable *K*, and act in conjunction with the brake shoes or jaws *D*, and their appurtenances to stop the car. This shoe *R*, is in the form of a lever with a curved head at one end to engage the cable and it is fulcrumed in suitable bracket arms connected to the frame *Q*, and is connected with the weight *J*, by a rod *S*, whereby it will be seen that when the cable is released from the keeper *M*, and the weight moves downwardly it (the shoe *R*), will be forced against the cable and will bind the same against the frame *Q*, so as to assist in holding the car against downward movement.

Should the car settle after the shoes or jaws *D*, are applied against the guides or ways *A*, the cable *K*, moving as indicated by arrow in Fig. 2, will draw the shoe *R*, in the direction indicated by arrow and will enable the same to more forcibly and securely bind the cable against the frame *Q*. When the cable is moved as stated by the settling of the car, the lever-shoe *R*, through the medium of the rod *S*, will force the weight *J*, downwardly and through the medium of the cable, lever *H*, wheel *G*, and levers *E*, will more forcibly press the jaws or brake shoes *D*, against the ways or guides *A*, and effectually prevent movement of the car.

A portion of the cable *K*, depends below the lever *H*, and rests within convenient reach of the car attendant so as to enable him, when the car has been stopped at an inconvenient point by the safety devices described, to draw downwardly upon the cable and thereby lower the lever *H*, and raise the weight *J* to disengage the shoes *D*, from the ways *A*, and the shoe *R*, from the cable *J*, and at the same

time bring the button or enlargement *N*, on the cable into engagement with the keeper *M*, which will hold the safety devices in their normal position so as to permit of the car being moved to a convenient point to discharge its passengers or freight.

When desirable, winding mechanism, such as illustrated in Figs. 9, 10, and 11, may be provided in the car for drawing the cable *J*, down and returning the safety devices to their normal position. This mechanism comprises a drum *r*, fixed upon a shaft *s*, a ratchet wheel *t*, also fixed on said shaft, a pawl *u*, for preventing retrograde movement of the ratchet wheel and a hand lever *v*, carrying a spring pressed detent *w*, engaging the ratchet wheel, which hand lever is arranged within convenient reach of the car attendant and is provided with a spring *x*, which bears at one end against the beam *e*, so as to assist the attendant in actuating the lever. By working the said lever *v*, to and fro, it will be perceived that the attendant may readily draw the cable *K*, downwardly and return the safety devices to their normal positions for the purpose stated.

In the practice of my invention, it will be seen that when the hoisting cable breaks or when the car runs away and gets beyond the control of the operator, it is simply necessary for him to grasp the lever *P*, and move it in the direction indicated by arrow when the brakes will be applied and the car will be gradually but surely stopped in the manner described.

I do not desire to be understood as confining myself to placing my improved safety devices upon the top of the elevator cars, nor do I desire to be understood as limiting myself to using the devices upon elevator cars as they may be used to advantage upon inclined tramway and other cars.

Having described my invention, what I claim is—

1. In an elevator safety device, the combination of brake shoes adapted to engage ways or guides and arranged on the elevator car, levers connected at their outer ends with the brake shoes, an equalizing bar or link connecting the inner ends of the levers, a wheel mounted on said equalizing bar or link, and a cam lever engaging said wheel, substantially as and for the purpose set forth.

2. In an elevator safety device, the combination of brake shoes adapted to engage ways or guides and arranged on the elevator car, levers connected at their outer ends with the brake shoes, an equalizing bar or link connecting the inner ends of the levers, a wheel mounted on said bar or link, a cam lever engaging said wheel, and a spring for returning the wheel to its normal position, substantially as and for the purpose set forth.

3. In an elevator safety device, the combination of brake shoes adapted to engage ways or guides and arranged on the elevator car, a lever, mechanism intermediate of the lever

and the brake shoes, a weight, a cable connecting said weight and the lever on the car and taking over a sheave, and a keeper on the car adapted to engage and normally hold the
5 said cable so as to prevent the weight from moving the lever, substantially as and for the purpose set forth.

4. In an elevator safety device, the combination of an elevator car, brake shoes adapted
10 to engage ways or guides and arranged on the elevator car, a weight, a cable connected at one end to the car and taking around a sheave carried by the weight and also taking around
15 other sheaves, intermediate mechanism connecting the opposite end of the cable and the brake shoes, and a keeper on the car adapted to engage and normally hold the said cable so
20 as to prevent the weight from applying the brakes, substantially as and for the purpose specified.

5. In an elevator safety device, the combination of an elevator car, a weight, a cable connected at opposite ends with the car and
25 taking around a sheave carried by the weight and also taking around other sheaves, a brake shoe R, mounted on a stationary support adapted to engage the cable, a connection between
30 said brake shoe and the weight, and means on the car adapted to normally hold the cable so as to prevent the weight from applying the brake shoe, substantially as and for the purpose set forth.

6. In an elevator safety device, the combination of an elevator car, brake shoes adapted
35 to engage ways or guides and arranged on the elevator car, a weight, a cable connected at one end to the car and taking around a sheave carried by the weight and also taking around
40 other sheaves, intermediate mechanism connecting the opposite end of the cable and the brake shoes, a brake shoe R, adapted to engage the cable, a connection between the said
45 brake shoe and the weight and means on the car adapted to normally hold the cable so as to prevent the weight from applying the brakes, substantially as and for the purpose set forth.

7. In an elevator safety device, the combination of an elevator car, brake shoes adapted
50 to engage ways or guides and arranged on the elevator car, a weight, a cable connected with the weight and taking over sheaves, mechanism connecting the cable and the brake shoes,
55 a keeper on the car adapted to normally hold the cable so as to prevent the weight from applying the brakes, and a lever arranged on the car and connected with the keeper whereby
60 the car attendant is enabled to release the cable and thereby apply the brakes, substantially as and for the purpose set forth.

8. In an elevator safety device, the combination of brake shoes adapted to engage ways
65 or guides and arranged on the elevator car, a lever connected by intermediate mechanism with said brake shoes, a weight, a cable connected at one end to the car and taking around
a sheave carried by the weight and also tak-

ing around other sheaves and connected at its opposite end to the lever, a brake shoe R, adapted to engage the cable, a rigid connection between said brake shoe and the weight
70 and means on the car adapted to normally hold the cable so as to prevent the weight from applying the brakes, substantially as and for the purpose set forth.

9. In an elevator safety device, the combination of a car, a weight, the cable connected
75 with the car and weight, means on the car for normally holding the cable so as to prevent downward movement of the weight, a shoe R, adapted to engage the cable and a connection
80 between said shoe and the weight, substantially as and for the purpose set forth.

10. In an elevator safety device, the combination of an elevator car, brake shoes adapted
85 to engage ways or guides and arranged on the car, levers connected at their outer ends with the brake shoes, an equalizing bar or link connecting the inner ends of the levers, a wheel
90 mounted on said bar or link, a cam lever engaging said weight, a weight, a cable connecting said weight, and the cam lever, a keeper device adapted to engage and normally hold
95 the cable so as to prevent the weight from applying the brakes, and a hand lever arranged on the car and connected with the keeper whereby the attendant is enabled to release
the cable and apply the brakes, substantially as specified.

11. In an elevator safety device, the combination of an elevator car, brake shoes adapted
100 to engage ways or guides and arranged on the car, a lever arranged on the car and connected by intermediate mechanism with the brake shoes, a weight, a cable connecting the weight
105 and the lever and having a button or enlargement N, a keeper on the car, adapted to engage and normally hold the button N, of the cable so as to prevent the weight from applying
110 the brakes, and a device extending from the lever into the car, so as to enable the car attendant to return said lever and the other parts to their normal positions after the car
has been stopped by the safety devices.

12. In an elevator safety device, the combination of an elevator car, brake shoes adapted
115 to engage ways or guides and arranged on the car, a lever arranged on the car and connected by intermediate mechanism with the brake shoes, a weight, a cable connecting the weight
120 and the lever and having a button or enlargement N, a keeper on the car adapted to engage and normally hold the button N, of the cable so as to prevent the weight from applying the
125 brakes, winding mechanism arranged in the car, and a rope connecting the lever and the winding mechanism, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses. 130

FREDERICK T. ELLITHORPE.

Witnesses:

PATRICK HEALY,
JOSIAH T. LOVEJOY.