

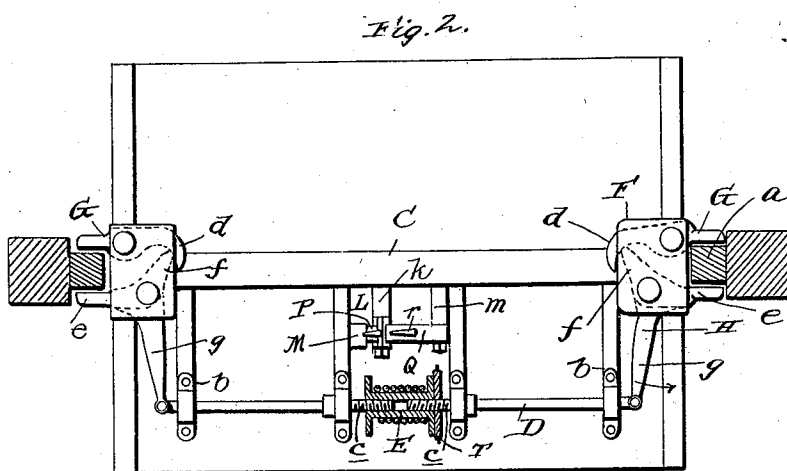
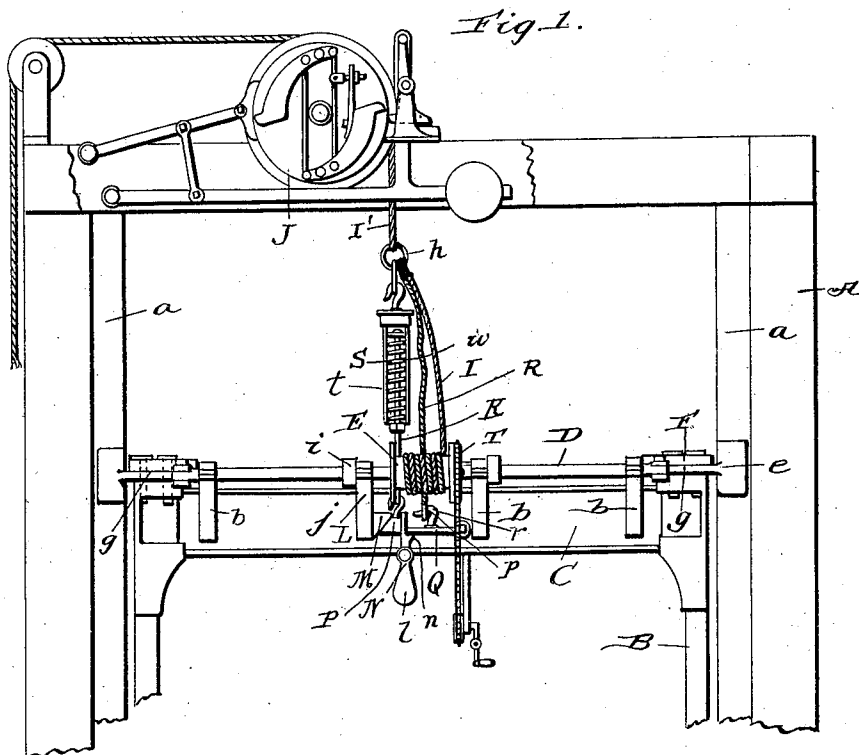
(No Model.)

2 Sheets—Sheet 1.

A. C. ELLITHORPE.
SAFETY DEVICE FOR ELEVATORS.

No. 557,117.

Patented Mar. 31, 1896.



Witnesses:

E. H. Rader
H. P. Matthews.

Inventor

A. C. Ellithorpe
By *James J. Sheehy*
Attorney

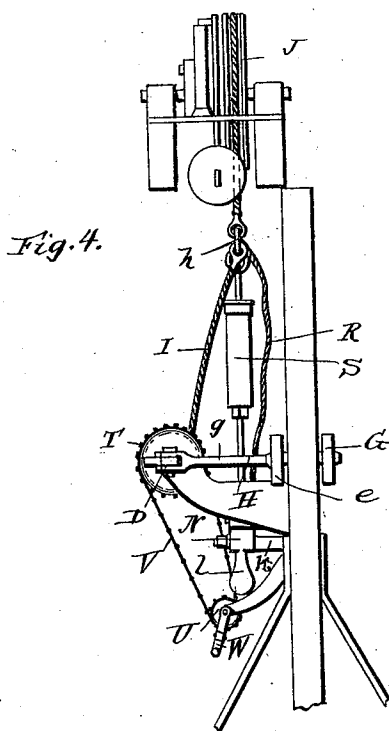
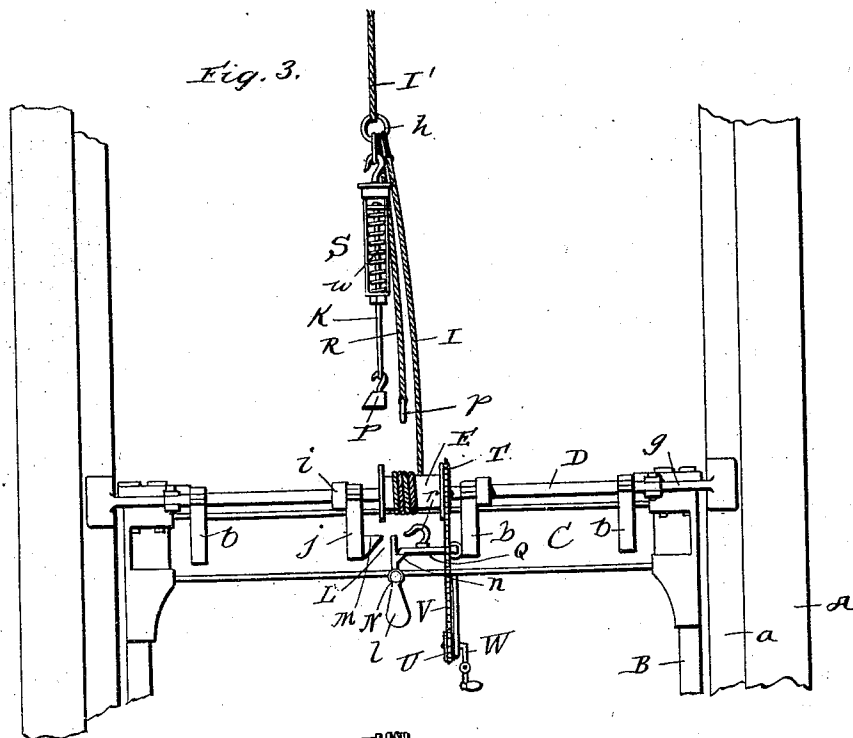
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UNITED STATES PATENT OFFICE.

ALBERT C. ELLITHORPE, OF CHICAGO, ILLINOIS.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 557,117, dated March 31, 1896.

Application filed May 20, 1895. Serial No. 549,976. (No model.)

To all whom it may concern:

Be it known that I, ALBERT C. ELLITHORPE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, 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 more particularly to automatic safety devices, and it has for one of its objects to provide cheap, compact, and reliable devices adapted, when the elevator-car attains a dangerous speed, to automatically apply the brakes so as to stop the car and avert a casualty.

Another object of the invention is to provide safety devices which may be mounted on an elevator-car in such manner as not to interfere with the ordinary connection of the lifting-cable thereto and the working of said cable.

Other objects and advantages of 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 illustrating a portion of an elevator arranged between guides and equipped with my improvements, the several parts being shown in their normal positions or the positions they occupy during the ordinary running of the car. Fig. 2 is a top plan view of the car and the devices thereon, with parts in section. Fig. 3 is a view similar to Fig. 1, with the several parts shown in the position which they assume when the safety devices have been set to stop the car; and Fig. 4 is an elevation taken at right angles to Fig. 1, with the parts in the same positions as in Fig. 1.

Referring by letter to said drawings, A indicates the ordinary standards or uprights of an elevator-shaft, which are provided with tracks or guides *a*, and B indicates the car, which is provided with the transverse beam C, and is otherwise of the ordinary construction. The said beam C serves for the connection of the hoisting-cable (not illustrated)

and also serves for the connection of the brackets *b*, in which the endwise-movable rods D are journaled, as shown. These rods D have their contiguous end portions threaded in opposite directions, as indicated by *c*, to engage the interior right and left threads, respectively, of the drum E, which is mounted on the said rods, whereby it will be seen that when the said drum is rotated in one direction the rods will be moved outwardly or in opposite directions, and when the drum is rotated in the opposite direction the rods will be drawn inwardly or toward each other.

F indicates suitable bearings, which are connected to the beam C adjacent to the ends thereof.

G indicates lever-jaws which are fulcrumed at intermediate points of their length in the bearings F and are adapted at one end to engage the tracks or guides *a* and preferably have their opposite ends *d* curved in the manner shown, and H indicates levers which may also be fulcrumed in the bearings F and are provided with jaw branches *e* for engaging the tracks or guides *a*, branches *f* for engaging the inner ends of the lever-jaws G, and the power branches *g*. Said power branches *g* are suitably connected with the endwise-movable rods D, and it will therefore be observed that when said rods are shoved outwardly the levers H will be rocked in the direction indicated by arrow, and in consequence their jaw branches *e* will be pressed against the guides or tracks *a*, while their branches *f* will engage the ends *d* of the lever-jaws G, so as to press and hold said jaws G against the guides or tracks *a*. When the rods D are drawn inwardly, the jaw branches *e* of the levers H will be moved away from the guides or tracks *a*, and the branches *f* of said levers will assume the position shown in Fig. 2, so as to permit the outer portions of the lever-jaws G to rest away from the tracks or guides *a*. The lever-jaws G and the levers H may, by reason of their construction, be made comparatively heavy and strong, and it will therefore be seen that they may be powerfully pressed against the tracks or guides *a* to stop the car without danger of them being broken or damaged.

On the drum E is wound a cable I, which

is suitably connected, as by a ring *h*, with a cable I', which is designed to take over or around a governor sheave or pulley J or be placed in engagement with or connected to any suitable governor which, when it attains a high speed, will retard the passage of the cable, so as to enable said cable as it unwinds from the drum on a falling car to rotate said drum and thereby set the brakes in the manner before described.

For the purpose of normally holding the cables I I' on the drum, so as to prevent rotation of said drum and a consequent application of the brakes when the car is running at an ordinary rate of speed, I provide a cable K, which is connected at one end with the cables I I', and a keeper L, comprising two members M N, which are arranged on the car and are designed to engage a suitable device P—such as a beveled block, hook or ring, preferably a ring—carried by the cable K.

The fixed keeper member M may be of any suitable construction and may be mounted in any approved manner, but I prefer in practice to connect it to an arm *j*, depending from a bracket *i*, carried by beam C, and to bevel it, as shown, for a purpose presently understood.

The movable keeper member N is preferably fulcrumed on an arm *k* connected to the beam C, and preferably has its lower portion *l* weighted or made heavy, so that it will automatically assume and normally rest in the position illustrated in Fig. 1. Said movable keeper member N is normally held in the position shown in Fig. 1, so as to enable it, in conjunction with the fixed member M, to hold the device P of cable K by a latch Q, which is pivoted at one end to a support *m*, connected to the beam C, and is designed to rest on a shoulder *n*, formed on the upper portion of the keeper member N, so as to normally prevent the said upper portion from swinging away from the fixed keeper member M and releasing the device P, and consequently the cables K and I I'. From this it will be observed that before the device P can be released, which is the initial step in the application of the brakes or safety devices, the latch Q must be raised to permit the upper portion of the keeper member N to swing away from the member M. To do this, I provide the cable R, which is connected with the cables I I', and is provided at its lower end with an eye *p* to engage a hook *r* on the latch Q, or is otherwise so connected to said latch that when the latch is raised it (the cable) will be released therefrom.

In order to prevent the imposition of strain on the keeper members M N, I provide the cable K with a spring S, which preferably comprises the tubular portion *t*, connected to one portion of the cable and a coiled spring *w*, connected to the other portion of the said cable. The said spring gives when the car is suddenly started downwardly, and also

gives when the car is moving downwardly at a high though not dangerous rate of speed, and consequently it will be seen that the keeper members M N will not be subjected to strain at any time and will therefore not be liable to wear, break, or get out of order, which is a desideratum. The stretching of the spring S, incident to the running of the car, renders it necessary to make the cable R slack, as illustrated, so that it will not interfere with the stretching of the spring.

In the practical operation of my improvements, when the car falls by reason of the lifting-cable breaking or from any other cause or attains a dangerously-high speed, the passage of the cables I I' will be retarded by the governor sheave or pulley J, and in consequence the spring S will be stretched and, through the medium of the cable R, the latch Q will be raised, so as to enable the upper portion of keeper member to swing away from keeper member M and release the device P on the cable K. The cable R will also be released from the latch Q when said latch is raised, and therefore it will be seen that the cables I I' are free to unwind from the drum E as the car continues to fall, so as to rotate said drum and thereby apply the brakes or safety devices and gradually stop the car.

In order to enable the attendant within the car to conveniently rotate the drum E, so as to release the brakes and wind the cables I I' on said drum, I provide the drum E with a sprocket-wheel T and also arrange a sprocket-wheel U in the car and connect the said wheels by a sprocket-chain V. I also provide a crank W on the shaft of the wheel U, and may, if desired, use a folding or removable crank, so as to prevent mischievous persons from meddling with the apparatus. After the cables I I' are wound upon the drum E the ring *p* of the cable R may be readily placed in engagement with the hook *r* of the latch Q, and the device P of cable K may be readily placed in engagement with the keeper members M N, as obvious.

From the foregoing it will be appreciated that my improved safety devices are very simple, compact, durable and highly reliable, and it will also be appreciated that the devices may be mounted upon a car in such a manner as not to interfere with the connection and working of the lifting-cable and its appurtenances.

Having described my invention, what I claim is—

1. In a safety device for elevators, the combination of an elevator-car, guides or tracks therefor, lever-jaws fulcrumed at an intermediate point of their length on the car and adapted to engage the guides or tracks, levers also fulcrumed on the car and having jaw branches *e* adapted to engage the guides or tracks, branches *f* for engaging the lever-jaws and pressing the same against the guides or tracks, and power branches *g*, disposed at

an angle to the branches *e*, and *f* and a suitable means for actuating said levers, substantially as specified.

2. In safety devices for elevators, the combination of an elevator-car, guides or tracks therefor, lever-jaws fulcrumed at an intermediate point of their length on the car and adapted to engage the guides or tracks, levers also fulcrumed on the car and having jaw branches *e*, adapted to engage the guides or tracks, branches *f*, for engaging the lever-jaws and pressing the same against the guides or tracks, and power branches *g*, disposed at an angle to the branches *e*, and *f*, endwise-movable rods mounted on the car and connected with the power branches *g*, of the levers and having right and left screw-threads, and a rotary device having interior right and left handed threads engaging the right and left threads of the rod, substantially as specified.

3. In an elevator, the combination of a car, a rotary device carried by the car, cables *I*, *I'*, connected with said rotary device, a keeper mounted on the car and comprising a fixed member, a movable member, and a movable latch for normally holding the movable keeper member against movement away from the fixed member, a device connected with the cables *I*, *I'*, and normally engaged and held by the keeper, and a detachable connection between the cables *I*, *I'*, and the movable latch of the keeper, substantially as specified.

4. In an elevator, the combination of a car, guides or tracks therefor, appliances mounted on the car and adapted to grip the guides or tracks, a rotary device carried by the car, mechanism intermediate of the rotary device and the gripping appliances, cables *I*, *I'*, connected with said rotary device, a keeper mounted on the car and comprising a fixed member, a movable member, and a movable latch for normally holding the movable keeper member against movement away from the fixed member, a device connected with the cables *I*, *I'*, and normally engaged and held by the keeper, and a detachable connection between the latch and the cables *I*, *I'*, substantially as specified.

5. In an elevator, the combination of a car, guides or tracks therefor, appliances mounted on the car and adapted to grip the guides or tracks, a rotary device carried by the car and connected by intermediate mechanism with the gripping appliances, cables *I*, *I'*, connected with said rotary device, a suitable device for retarding the passage of the cable when the car attains a high speed, a keeper mounted on the car and comprising a fixed member, a movable member and a movable latch for normally holding the movable keeper member against movement away from the fixed member, a device connected with the cables *I*, *I'*, and normally engaged and held by the keeper, and a detachable connection between the latch and the cables *I*, *I'*, substantially as specified.

6. In an elevator, the combination of a car, guides or tracks therefor, appliances mounted on the car and adapted to grip the guides or tracks, a rotary device carried by the car and connected by intermediate mechanism with the gripping appliances, cables *I*, *I'*, connected with said rotary device, a suitable device for retarding the passage of the cable when the car attains a high speed, a keeper mounted on the car and comprising a fixed member, a movable member and a movable latch for normally holding the movable keeper member against movement, a device adapted to be engaged and normally held by the keeper, a yielding connection between said device and the cables *I*, *I'*, and a detachable connection between the latch and the cables *I*, *I'*, substantially as specified.

7. In a safety device for elevators, the combination of a car, a rotary device carried by the car, cables *I*, *I'*, connected with said device, a keeper mounted on the car and comprising the fixed beveled member, the pivoted member having its lower portion weighted and also having the shoulder on its upper portion, and the pivoted latch adapted to rest on the shoulder of the movable keeper member and having a hook, a beveled block adapted to be engaged by the keeper members and connected with the cables *I*, *I'*, and a cable connected to the cables *I*, *I'*, and detachably connected with the hook of the latch, substantially as specified.

8. In an elevator safety device, the combination of a car, guides or tracks therefor, appliances carried by the car and adapted to grip the guides or tracks, a rotary drum, mechanism intermediate of said drum and the gripping appliances, a sprocket-wheel fixed on the drum, a sprocket-wheel arranged in the car, and an endless chain connecting said sprocket-wheels, substantially as specified.

9. In an elevator safety device, the combination of a car, a guide or track therefor, a lever-jaw fulcrumed at an intermediate point of its length on the car and adapted to engage the guide or track, a lever also fulcrumed on the car and having a jaw branch *e*, adapted to engage the guide or track, a branch *f*, for engaging the lever-jaw and pressing the same against the guide or track, and a power branch *g*, disposed at an angle to the branches *e*, *f*, an endwise-movable rod connected at one end with the power branch *g*, of the lever, and having threads, and a rotary device receiving said rod and having interior threads engaging the threads thereof, substantially as specified.

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

ALBERT C. ELLITHORPE.

Witnesses:

F. T. ELLITHORPE,
FRANK ROCHE.