

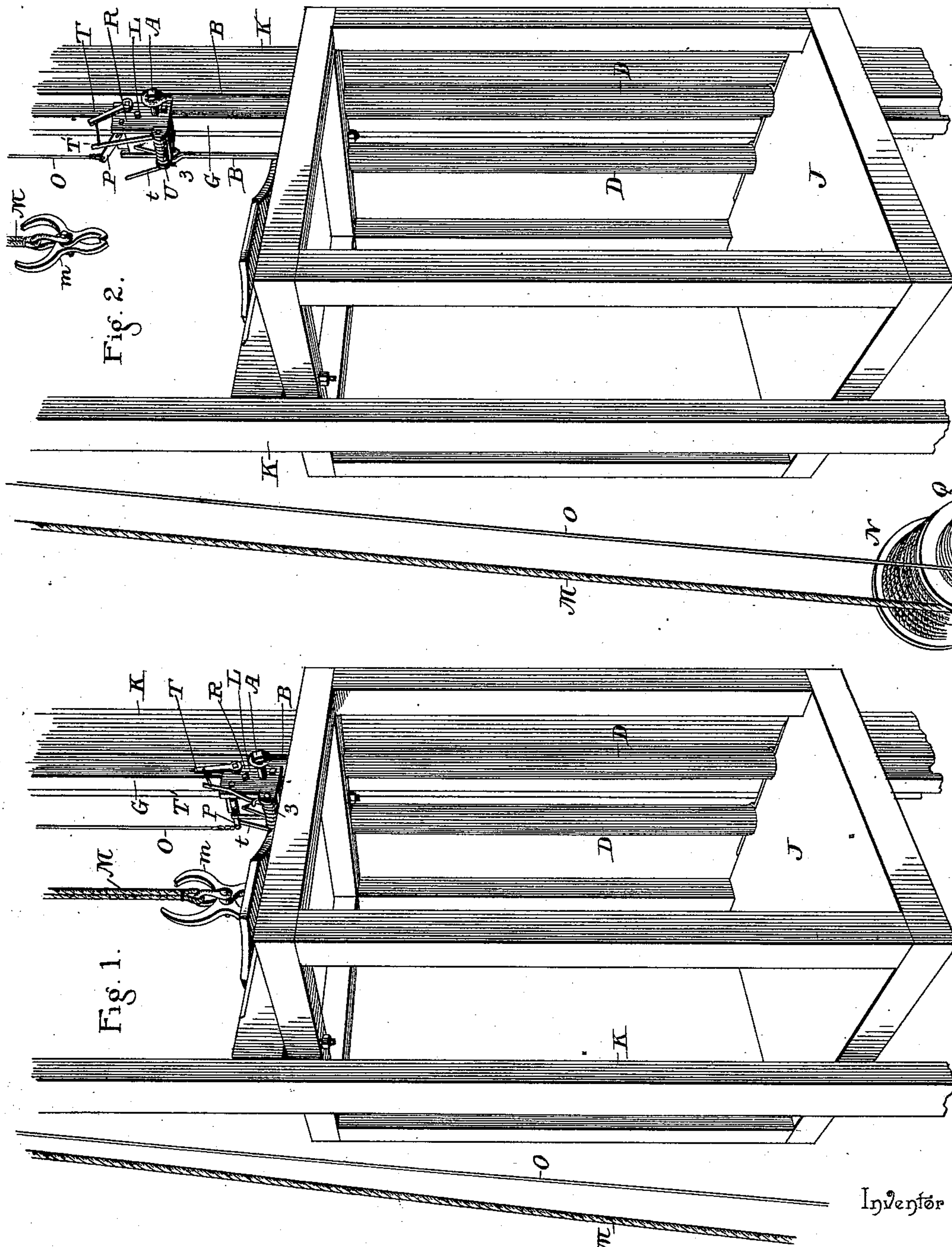
(No Model.)

2 Sheets—Sheet 1.

M. C. LITTLEWORTH.
SAFETY CATCH FOR ELEVATORS.

No. 540,865.

Patented June 11, 1895.



Witnesses

Cha H. Ourand
V. B. Hillyard.

By his Attorneys.

Malcolm C. Littleworth

C. A. Snow & Co.

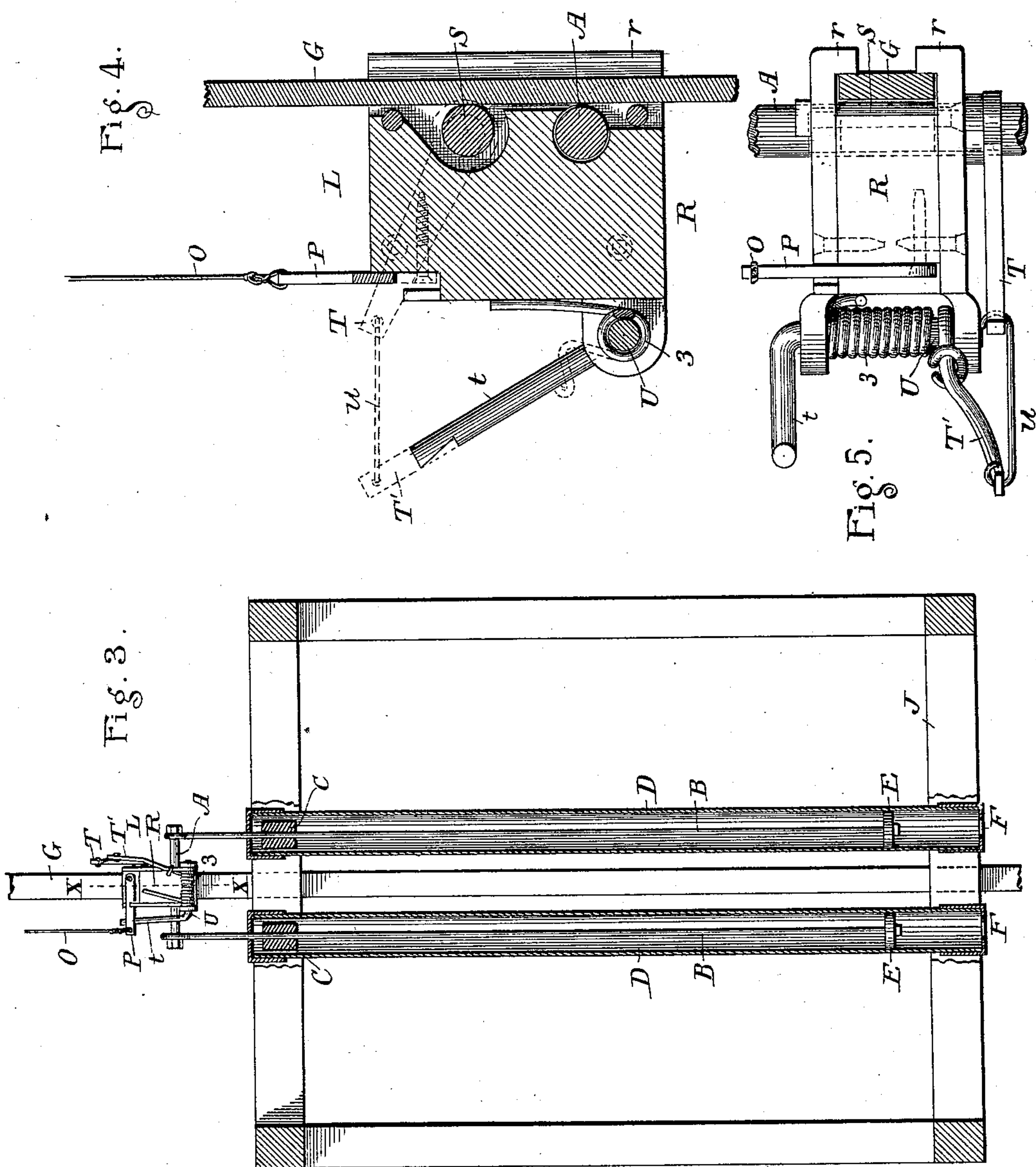
(No Model.)

2 Sheets—Sheet 2.

M. C. LITTLEWORTH.
SAFETY CATCH FOR ELEVATORS.

No. 540,865.

Patented June 11, 1895.



Inventor

Malcolm C. Littleworth

Witnesses

Chas H. Curand
V. B. Hillyard.

By his Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

MALCOLM C. LITTLEWORTH, OF DULUTH, MINNESOTA, ASSIGNOR OF FOUR-FIFTHS TO W. C. GOULD, W. A. GOULD, MATTIE A. GOULD, AND ELLA C. LAKE, OF SAME PLACE.

SAFETY-CATCH FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 540,865, dated June 11, 1895.

Application filed February 21, 1895. Serial No. 539,271. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM C. LITTLEWORTH, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented a new and useful Safety-Catch for Elevators, of which the following is a specification.

The present invention relates to safety appliances for cars and elevators for carrying passengers and freight, either up steep grades or vertically in shafts.

The primary object of the improvement is to provide a simple and efficient means carried by and movable with the car, and which will positively and surely check the descent of the car, in the event of the hoisting rope breaking, without jolt or jar, the car being gradually brought to a stop while the gripping device acts instantly the moment the hoisting rope separates.

The invention consists essentially of the novel means supported by and movable with the car and embodying a gripping device arranged to be brought into active operation the instant the hoisting rope gives way, so as to grip the safety or guide rail, and yielding connections between the car and the said gripping device, whereby the descent of the car is gradually checked.

The invention further consists of the peculiar organization of the gripping device, whereby the same is rendered certain and positive in its operation, and the combination therewith of a pneumatic cushion, which forms the yielding connections, to bring about the gradual and easy stoppage of a car.

In the drawings, Figure 1 is a perspective view showing the relative disposition of the parts under normal conditions. Fig. 2 is a view similar to Fig. 1, showing the operation of the invention in the event of the hoisting-rope breaking or becoming detached from the car. Fig. 3 is a front elevation of the gripping device, the pneumatic cylinders and car being shown in section. Fig. 4 is a section on a larger scale of the gripping device and safety-rail on the line X X of Fig. 3, looking to the left. Fig. 5 is a plan view of the gripping device.

The car J and the guide posts K of the ele-

vator shaft are well known parts, being illustrated to show the application of the invention.

The gripping device L co-operates with a safety or guide rail G to check the descent of the car. The hoisting rope M has a grapple *m* at its lower end to engage with a suitable catch on the car, and is adapted to wind upon a drum N. The safety line O is attached at one end to a latch P by means of which the gripping device is normally held from active operation, and the other end is adapted to wind upon a drum Q on the same shaft with the drum N.

The gripping device comprises a suitable housing or frame R, having inwardly extending portions *r* to engage with one side of the safety rail G, an eccentric S journaled in the sides of the frame and acting in opposition to the portions *r* to clamp and bind upon the safety rail, and a spring actuated arm T' operatively connected with the eccentric to throw the latter into working position in the event of the car becoming detached from its hoisting rope, either by the said rope breaking or by the grapple *m* slipping. A short shaft U is journaled in extensions of the frame, and has arms, T' and *t*, at its respective ends, the arm *t* being engaged by the latch P, and the arm T' connected by wire *u* with the arm T secured upon one journal of the eccentric S. A coil spring 3 is mounted upon the shaft U, one end engaging with the frame R, and the other end with the arm T'.

A pneumatic cushion is provided on the car, and forms a yielding connection between the car and the gripping device. This pneumatic cushion consists of a pair of cylinders D, secured to the car, having small openings F in one end and buffers C at the opposite end, pistons E working in the cylinders, and rods B connecting the pistons E with a cross-bar or bolt A of the frame R. These cylinders D will be of required length, and provided in sufficient number to effect the desired result.

Under normal conditions—i. e., when the car is in working order—the pistons E occur near the lower, or apertured ends of the cylinders, and the eccentric S is held out of position by means of the latch P engaging with

the arm *t*, the latter being drawn back against the tension of the spring 3. In the event of the hoisting rope breaking, or the grapple *m* slipping, the car will descend and draw upon the safety line *O*, which will disengage the latch *P* from the arm *t*, and the spring 3, regaining itself, will, by means of the connections herein described, bring the eccentric into working position and cause it to grip the safety rail *G* between it and the parts *r* of the frame *R*. The rods *B* being thus held fast, the car will descend gradually, compressing the air in the cylinders *D* until the car is brought to a stop.

As generally arranged the safety brakes of cars act instantly upon the breaking of the hoisting rope and grip the guides, or safety rail, thereby bringing the car to a sudden stop, and this sudden stoppage of the car results disastrously, inasmuch as the brake mechanism is deranged or fractured, and the jar strains the car and the guides. To overcome these objectionable features a spring, pneumatic cushion, or like contrivance has been provided and interposed between the car and the brake mechanism to apply the latter gradually in the event of the hoisting rope breaking, thereby obviating the jar or jolt. This arrangement is open to the objection that the springs, or like means provided to apply the brakes so as to bring the car to a gradual stop, are liable to weaken from long-continued disuse, and, when required to act in an emergency, fail to respond and perform the office for which they are designed. Hence an accident is the result. By the present invention the gripping device acts and is applied instantly to grip the safety rail upon the breaking of the hoisting rope, and the descent of the car is gradually checked by the cushioning device interposed between the car and the gripping device.

It is to be observed that both the gripping and the cushioning devices are carried by and movable with the car, the gripping device having positive connection with the car by means of the piston rods *B*. By having the gripping and the cushioning devices juxtaposed a quick and responsive action is attained and the chances for accident resulting from failure of the safety devices to act are reduced to a minimum.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. The combination with a car, its hoisting rope, and a safety rail, of a cushioning device having positive attachment with the car, and a gripping device constructed to automatically and instantly grip the safety rail upon the car being accidentally detached from its hoisting rope, and having direct and positive attachment with the cushioning device, whereby the descent of the car is gradually checked after the gripping device has become positively engaged with the said safety rail, substantially as set forth.

2. The combination with a car, its hoisting rope, and a safety rail, of a cylinder permanently attached to the car, a piston adapted to operate in the cylinder, and a gripping device constructed to positively and instantly clutch the safety rail upon the car becoming detached from its hoisting rope, and having connection with the piston rod, whereby the descent of the car is gradually checked after the gripping device has clutched the safety rail, both the cylinder with its piston and the gripping device operating and moving with the car, substantially as specified.

3. The combination with a car, its hoisting rope, and a safety rail, of a gripping device comprising an eccentric arranged to grip the safety rail between a portion of the housing and itself, a spring disposed to throw the eccentric into working position, and a latch to hold the eccentric out of operation against the tension of the said spring, and means for automatically releasing the eccentric and throwing it against the rail on the accidental detachment of the car from its hoisting rope and a cushioning device between the car and the said gripping device, substantially as described.

4. In combination, a car, its hoisting rope, a safety rail, a gripping device movable with the car, and normally held out of action by means of a latch, a pair of air cylinders having openings at one end and buffers at the opposite end attached to the car, and rods connecting the pistons with the gripping device, substantially as described for the purpose specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MALCOLM C. LITTLEWORTH.

Witnesses:

F. D. CULVER,
J. WM. BULL.