

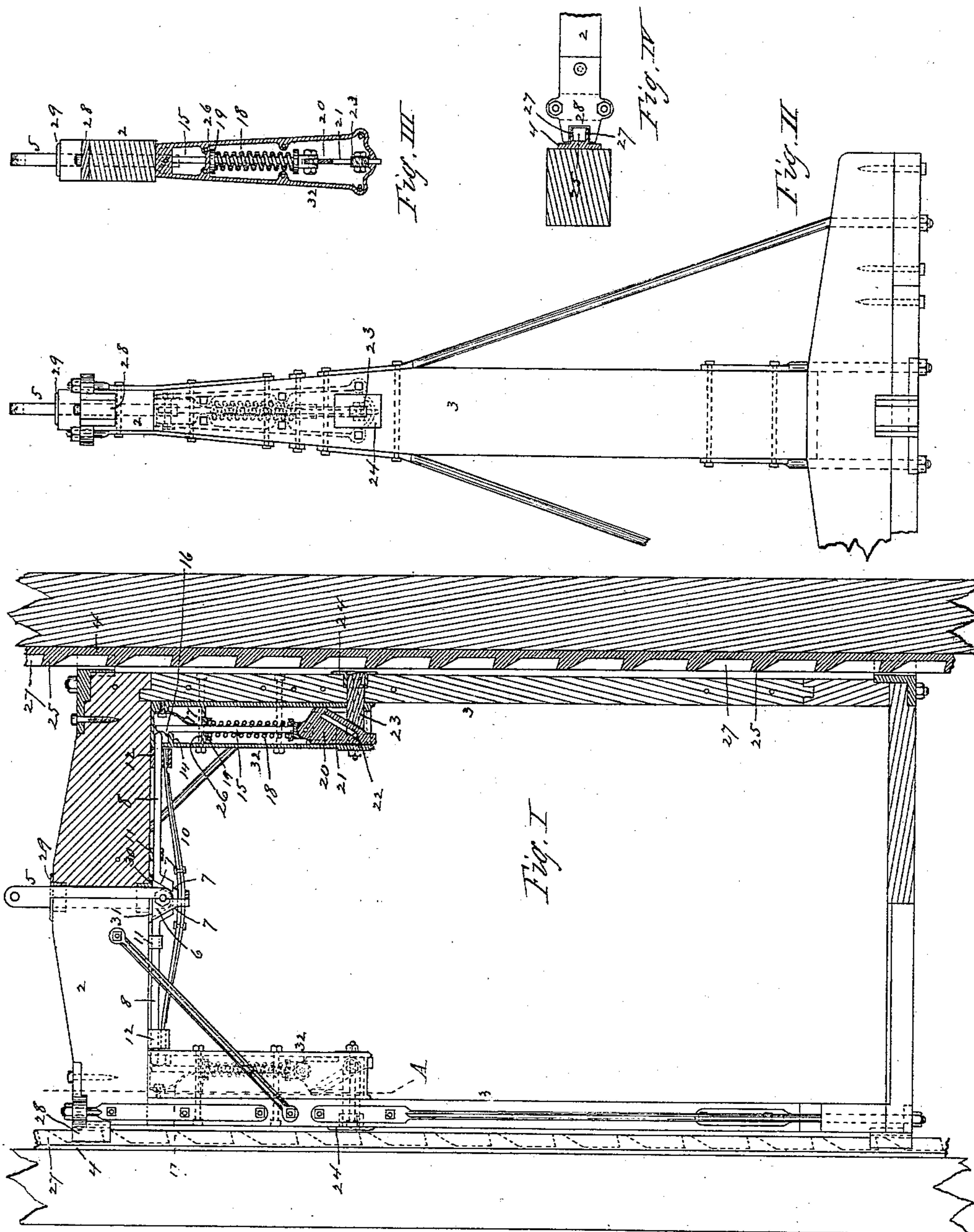
(No Model.)

A. C. RICE.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 277,343.

Patented May 8, 1883.



Witnesses,

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UNITED STATES PATENT OFFICE.

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SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 277,343, dated May 8, 1883.

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To all whom it may concern:

Be it known that I, ALVA C. RICE, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Safety Attachments for Elevators, of which the following is a specification and description.

The object of my invention is to furnish an elevator with a safety locking mechanism to prevent the elevator from dropping or descending suddenly should the suspending cable or rope break or become suddenly detached from its fastening; and I accomplish this by the mechanism substantially as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure I is a half vertical section between the vertical guideways and a half front view of the elevator. Fig. II is a side view of the elevator removed from the vertical guideways. Fig. III is a transverse vertical section at line A of Fig. I, showing the safety locking mechanism; and Fig. IV is a top or end view of one of the vertical guideways containing the safety-teeth and the guide-iron secured to the elevator.

In the drawings, 4 represents the vertical guideways, one secured to each side of any ordinary elevator-well. Each said guideway consists of two continuous vertical flanges, 27, with a series of teeth, 25, at suitable distances apart and located between these said flanges.

2 represents the cross-beam of the elevator-frame at the top, and 3 represents the side pieces firmly secured to the cross-beam 2, and to which the platform and lower part of the elevator-frame are also secured, and all suitably braced with iron in the ordinary manner. A vertical hole is made in the cross-beam 2 midway its length, with preferably a flanged thimble, as 29, secured around the hole at the top of the beam, and a similar thimble, as 30, fixed opposite on the lower side of the beam, and a rod, 5, extends through this hole and said thimbles, and is provided at its lower end with a wedge, 6, having two inclined sides, 7, with a horizontal shoulder, 31, at the upper end of the wedge. A spring, 10, is secured in or to the lower end of the wedge 6, whose extreme ends have a bearing upward within and against a socket, 12, secured to the cross-beam 2. A frame or case, as 32, is secured to

the upper part of each post 3, on the inner side of which is a projection, 14, and I fix a horizontal support, as 26, within this case or frame, in which support is made a vertical hole or slot, through which extends a rod or latch, 15, upon which, near its upper end, is made a catch, 16, and whose lower end is pivoted to or has made thereon a cam, 20. This cam consists, substantially, of a plate pivoted to or secured upon the lower end of the latch 15, and, extending downward vertically, is provided with an incline or slot, 21, to engage with a pin or projection made on the inner end of the locking-bolt to operate the latter. This cam is always held down by a weight or spring, preferably by a spiral spring, 18, placed around the latch, 15, and having a bearing at its lower end against the cam, and at its upper end against the support 26, or a socket, 19, placed beneath and against said support, and through which the latch extends. A hole is made through each side post, 3, of the frame, preferably fitted with a flanged thimble, 24, through which extends a horizontal bolt, 23, whose inner slotted end extends in astride the plate or cam 20, and is provided with a projecting pin, 22, extending through the inclined slot 21 of the cam. The latch 15 is held inward at its upper part and against the projection 14 by any suitable spring, as 17, secured within the case or frame 32, and the lower end of this case may be open; or the lower end of the cam 20 may project through the bottom of said case, so that access may be had to the cam to force it and the latch upward when desired. The elevator-frame should be guided in its vertical movement preferably by a guide, as 28, secured in this case to the top of the cross-beam 2, and whose projecting flanged sides embrace the flanges and teeth of the vertical guideways 4. The horizontal bars 8 are held to the lower side of the cross-beam 2, one on each side the wedge 6, and are adapted to slide lengthwise through the sockets 11 and 12, secured to the lower side of the cross-beam 2, and whose inner ends abut against the inclined sides of the wedge 6, and whose outer ends extend to the latches 15, when the latter are in their most elevated position, each with its catch 16 bearing upon the upper side of the projection 14.

The spring 10 should be sufficiently strong to support nearly the whole weight of the ele-

vator, so that when unloaded the elevator, when suspended by a cable or rope attached to the rod 5, will bear with very little weight upon the shoulder 31 or upper end of the wedge 6, nearly all of its weight being supported by the spring 10. Should the elevator be more or less loaded, and the suspending cable or rope break above the rod 5, the elasticity of the spring 10 would cause the rod 5 and its wedge 6 to move quickly downward a little. This downward movement of the wedge forces the bars 8 longitudinally outward and against the upper ends of the latches 15, moving the latter outward sufficiently to disengage each catch 16 from the projection 14, when each cam 20 will be quickly forced downward, and the inclined slots or openings 21 in each cam will force the pin 22 and the bolt 23 outward through the frame 3 and thimble 24 into engagement with one of the teeth 25, and the elevator will be immediately stopped in its descent.

In order that the operation of the bolt 23 may be prompt and sure, the cam 20 should be as wide as the width of the interior of the case or frame 32 in the direction of the length of the bolt 23, and vertical guides may be made in the interior of the case 32, so that the movement of the cams 20 against or between the guides may be as nearly vertical as possible, with little or no lost motion in a lateral direction.

When the cable or suspending-rope has been broken and the latches 15 have been tripped to throw the bolts 23 outward, and the downward movement of the elevator has been stopped, as above described, after a new cable or rope has been secured to the rod 5 and the elevator has been slightly raised by it, the cams and latches may be moved up into place and secured with the catches 16 engaged against the upper side of the projections 14 by pushing upward against the lower ends of the cams 20, and the elevator is then ready for use.

Inasmuch as the function of the projections 14 is to catch and hold in their most elevated positions the latches 15, I denominate said projections the "retaining-catches."

It will be seen that the whole operation of

the device depends upon the sudden and prompt downward movement of the suspending-rod 5 and the wedge 6, connected therewith, caused by the action of the suspending-spring 10, secured to the wedge and rod, at the sudden breaking of the suspending-rope. This arrangement furnishes an effective safety device to prevent accident from the breaking of the suspending cable or rope, even when an elevator is loaded to its fullest capacity and elevated to any height.

Having thus described my invention, what I claim as new is—

1. The combination, with the suspending-rod of an elevator, of the wedge 6, secured thereto, the spring 10, secured to said wedge, the bars 8, adapted to be actuated by said wedge, catches 14, spring-actuated latches 15, adapted to engage with said catches, cams 20, secured to said latches, and sliding bolts 23, adapted to be moved outward with their ends projecting beyond the side of the elevator-frame, substantially as described.

2. As a means of operating the longitudinally-sliding bars 8, to disengage the latches from their retaining-catches, the combination, with said bars, of the suspending-rod 5, adapted to have a vertical movement through the cross-beam of the elevator-frame, the wedge 6 at the lower end of said suspending-rod, and a suspending-spring, 10, secured thereto, and having a bearing against the lower side of said cross-beam, substantially as described.

3. As a means of moving the locking-bolts through the side of the elevator-frame, the cams 20, each operated by a spring-actuated latch, 15, and provided with inclined slots or openings 21, a pin or projection at the inner end of each bolt, and extending into said inclined slots, substantially as described.

4. The combination of a vertical plate provided with vertical guide-flanges 27, and a vertical series of teeth located between said flanges, and a guide-piece attached to the elevator and provided with projections to embrace said guide-flanges, substantially as described.

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