P. P. LANE.

Improvement in Safety Device for Elevators.

No. 128,152. Patented June 18, 1872.

Fig. 1.

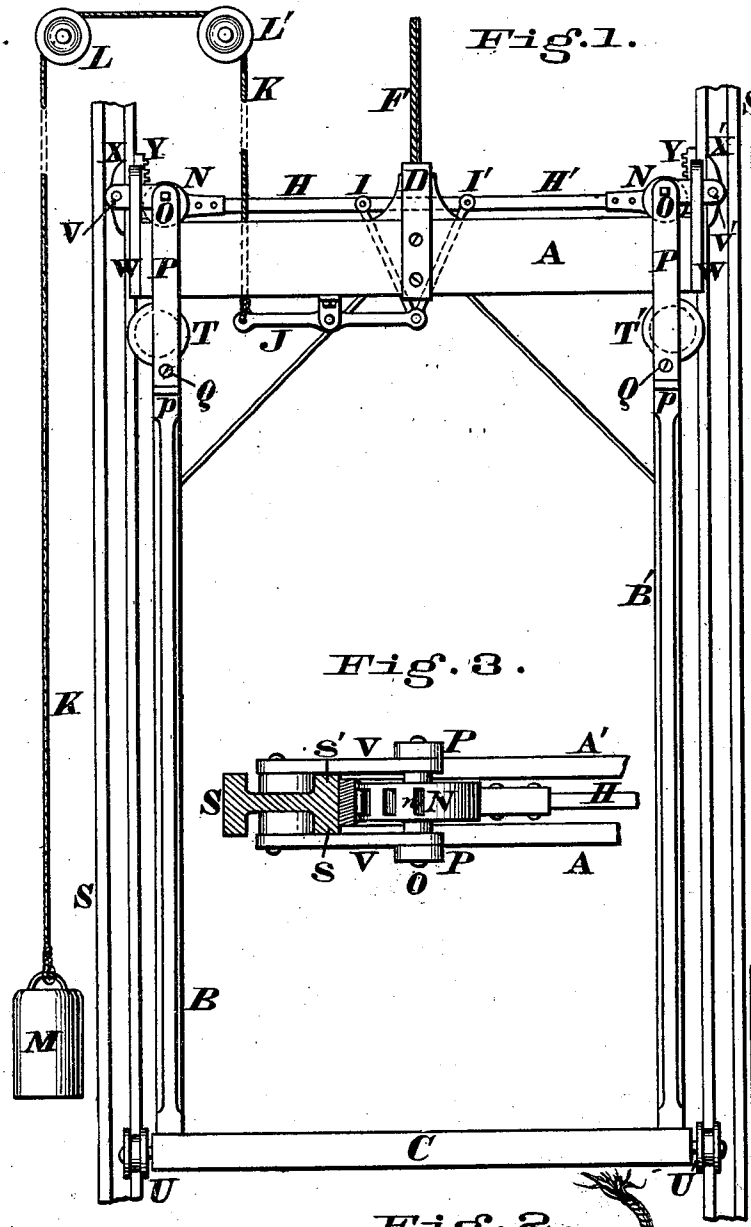


Fig. 4.

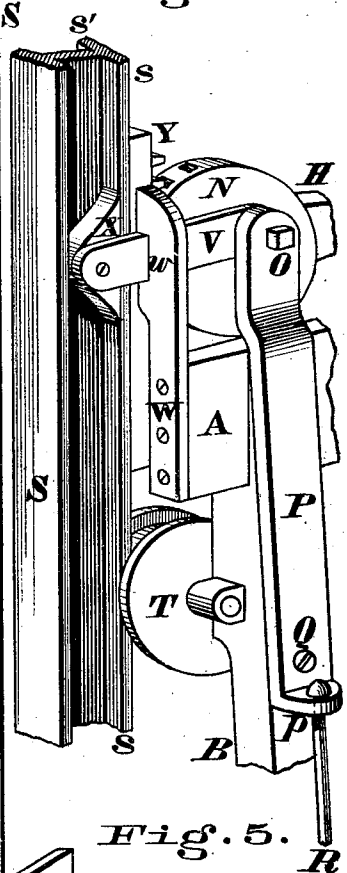


Fig. 3.

Fig. 5.

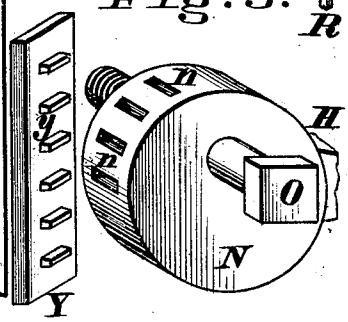
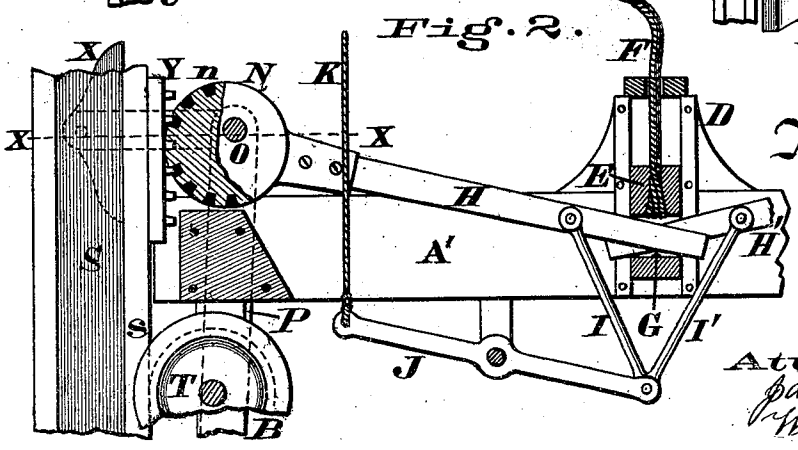


Fig. 2.



P. P. Lane
INVENTOR.
By Knight Bros
Attys.

Attest.
Jas. H. Layman.
Walter Allen

UNITED STATES PATENT OFFICE.

PHILANDER P. LANE, OF CINCINNATI, OHIO, ASSIGNOR TO LANE & BODLEY, OF SAME PLACE.

IMPROVEMENT IN SAFETY-DEVICES FOR ELEVATORS.

Specification forming part of Letters Patent No. 128,152, dated June 18, 1872.

I, PHILANDER P. LANE, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Safety Device for Power-Elevators, of which the following is a specification:

My invention is designed for the class of power elevators or hoists, whose movable platform is suspended from the operating-cable. Elevators of this kind are commonly provided with a safety device, so called, which device consists essentially of one or more pawls, intended, whenever the cable breaks or gives way from any cause, to engage with stationary racks, with which the guide-bars are armed throughout their lengths, such engagement being supposed to be secured by springs, intended to become effective on the interruption of the cable-tension. This expedient has proved entirely unreliable, the springs, being maintained at full tension, and performing no service so long as the cable continues intact—which may be months or years—either lose their resilient power, or become sprung or broken, or so brittle as to snap at the critical moment, or the pawls encountering the tops instead of the interstices of the rack-teeth, and failing to promptly arrest the descent of the platform, are swiftly swept by the momentum of the descending mass so rapidly from tooth to tooth as to afford no time for engagement; or, if at last entering, are either broken by or break the teeth of the racks; indeed, immediate effectiveness is vital to such apparatus, because if the platform once acquired the momentum of even a brief unopposed descent it is practicably irresistible.

The above-stated defects I avoid by the use of eccentric clamps, which, at the instant of impact, co-act with jaws to firmly grasp guide-bars, smooth throughout their lengths, the said clamp-action being brought into play by the descent of a reversely-acting counter-weight, connected to the levers by a suitable chain or cable, as hereinafter fully explained.

In the accompanying drawing, Figure 1 is a side elevation of a platform and accessories embodying my invention, the parts being in their usual position. Fig. 2 is a vertical section, on a larger scale, showing the self-clamping devices in action after the snapping of the main cable. Fig. 3 is a horizontal section at the line *x x*, Fig. 2. Figs. 4 and 5 are, respectively, enlarged views of the clamping device in position, and of the eccentric and sliding bar detached.

A A′ are the beams; B B′, the posts; and C is the floor of the elevator-cage or platform. Secured between the two beams, at their midlengths, is a box or housing, D, for the sliding block E, to which the main cable F is secured. All of the above parts are old and well known. The block E has a horizontal slot, G, to receive two levers, H H′, connected by links I I′ and rocker J, with a chain or wire-cable, K, which, being carried over two pulleys, L L′, situated somewhat higher than the highest hatchway, suspends at its other extremity my reversely-acting counter-weight M. Each lever H H′ terminates in a circular or other suitable cam or eccentric, N, which is, by means of a pivot-bolt, O, journaled eccentrically in cheek-plates P, whose lower ends are pivoted at Q to the posts B or B′. Each cheek-plate terminates in a lug, *p*, which, being connected by brace-rod R with the floor or other suitable part of the platform, relieves the pivot Q from the principal portion of the strain incident to the arrest of the descending platform. The guide-bars or stanchions S S′ are preferably of wrought-iron, having the represented I-shaped transverse section, and being entirely smooth and parallel-sided throughout their length. Flanges *s s′*, which project laterally from said bars, serve to give proper stiffness to and to preserve the rectilinearity of said bars, and serve as guides or ways for flanged rollers T T′ and U U′, which hold the platform in position. These flanges, in my invention, are further useful in conjunction with the griping devices, hereinafter described, to arrest a descending platform. V V′ are bars, which extend horizontally from bolt O, through notches *w* in brackets W, and are furnished at their other extremities with jaws X X′, which, when the eccentric is brought into service, are caused to press against the rear sides of the flanges S S′, and to co-operate with said eccentrics in firmly and instantly grasping the guide-bar. The eccentric N may either have smooth peripheries and bear directly against the inner faces of the guide-bars, or may bear against sliding-racks Y, which are supported in position by reason of their teeth *y*, occupy-

ing corresponding indentations *u* in the eccentric peripheries.

The operation of the above-described safety attachment is as follows: The instant that the tension of the main cable is interrupted from any cause—as for example, by becoming broken, as in Fig. 2, the counter-weight and the descending platform co-act to depress the levers, and thus bring the more divergent portions of the eccentrics to bear in the sliding-racks, and through them on the faces of the the guide-bars, and the same movement operates through the pivot O and the bar V V′, to bring the jaws X X′ in close contact with the rear sides of flanges S S′, so as to grip the guide-bar tightly between the opposing surfaces of the said jaws and racks *y* with a force proportional to the descending stress of the platform and its opposing counter-weight, thus holding the platform instantly and firmly against any further descent.

It will be seen that the descending counter-weight, with the upward pull of its cable on the one hand and the descending platform on the other hand, act in direct opposition to each other, and thus throw the eccentric clamps into contact with the guide-bars with a force due to the sum of the opposing actions of the platform downward, and the counter-weight cable upward; and that the clamps, consequently, take a firm hold almost at the precise spot where they first strike the guide-bars, and thus by preventing any appreciable descent, prevent, also, any serious accumulation of momentum.

The jaws X X′, co-acting with the eccentrics to grip the guide-bars, no danger arises of the apparatus becoming non-effective by reason of lateral deflection or lack of rectilinearity of the guide-bars.

The extended surfaces of the sliding racks Y, in contact with the guide-bars, secure at once the necessary adhesion. The peripheries of the eccentrics simply rolling on the racks, are effectually protected thereby, and are not liable to be ground off as they would be by direct contact with the said bars.

The counter-weight cable being constantly in plain view, the user of the elevator can always assure himself of the efficiency of the safety mechanism, the construction and mode of operation of which is also an assurance of effective action.

The described guide-bars or stanchions, smooth and parallel throughout their length, and with the represented I-section, are well adapted for the explained co-action with my described clamping-jaws, and are believed to be entirely new and highly valuable in such connection.

If desired the two flanges of the said guide-bars most distant from the platform may be omitted, so as to give the guide-bar a T-formed instead of an I-formed section.

I do not claim, broadly, the use of eccentric levers and counter-weight, such being old, as applied to safety devices of this kind; but

What I do claim is—

1. The jaws X X′, which co-act with the cam-levers to gripe the flanges of the guide-bars, so as not to depend upon the absolute rectilinearity and inflexibility of the bars.

2. The sliding wedge or rack Y, interposed between the cam and the bar, to protect the periphery of the cam, and secure adequate impinging surface.

3. The indented eccentric N *n*, levers H H′, rocking-lever J, arms I I′, and jaws X X′, in combination with the cage C, rack Y, guide-bars S S′, and counter-weight M, all constructed, arranged, and operated as set forth.

4. T or I-shaped guides, in combination with the clamping-jaws X X′, and eccentrics N, substantially as described.

In testimony of which invention I hereunto set my hand.

PHILANDER P. LANE.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.