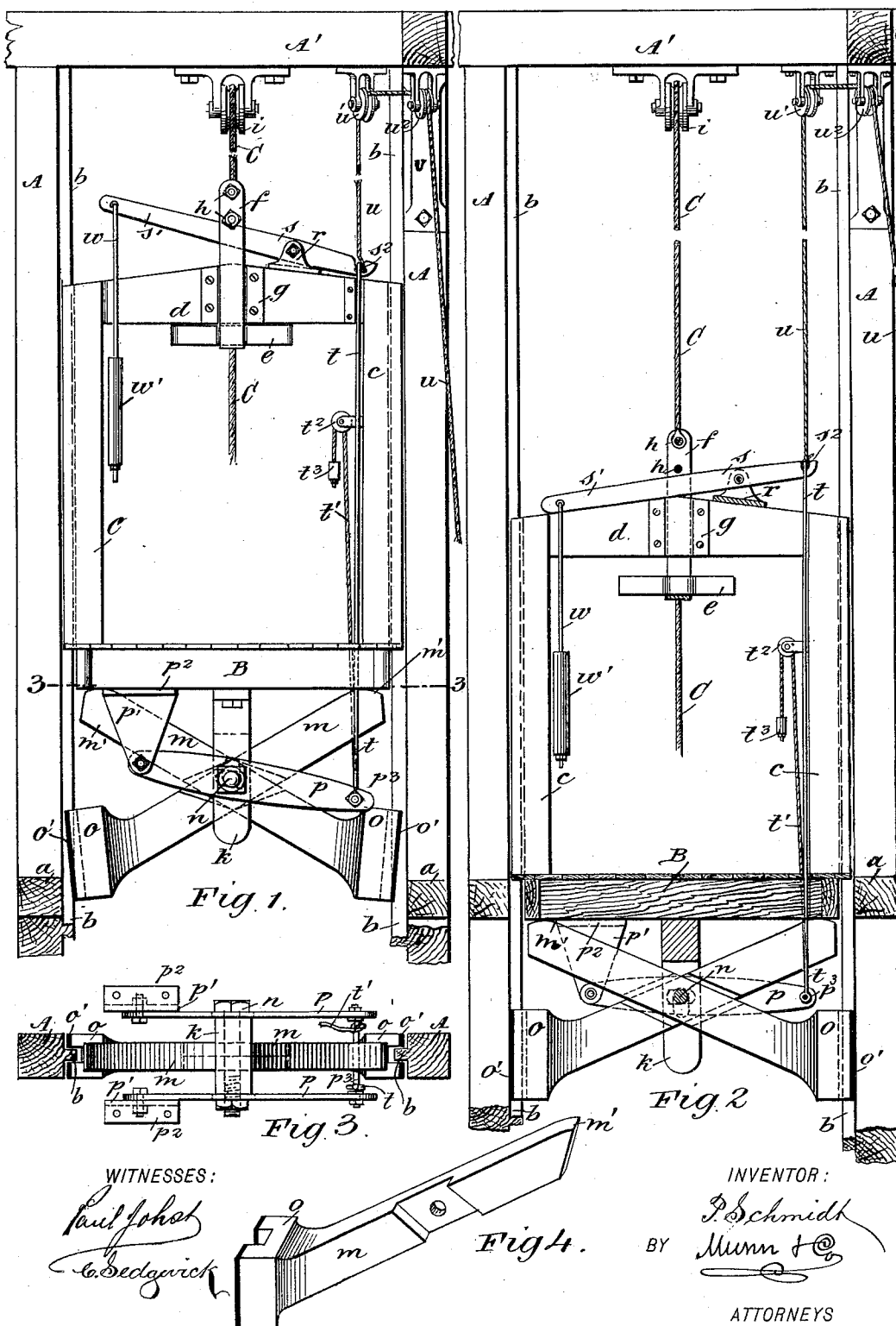


(No Model.)

P. SCHMIDT.
SAFETY DEVICE FOR ELEVATORS.

No. 432,443.

Patented July 15, 1890.



UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 432,443, dated July 15, 1890.

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To all whom it may concern:

Be it known that I, PHILIPP SCHMIDT, of La Crosse, in the county of La Crosse and State of Wisconsin, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description.

The objects of this invention are to provide a simple device which may be actuated by manual or other power, and that will automatically lock the elevator case or platform instantly if the hoisting rope or chain breaks, and, further, to furnish the elevator mechanism with means for controlling the ascent or descent of the platform or cage from said moving cage or platform, and also from without the same at different points.

With these ends in view my invention consists in certain features of construction and combinations of parts, which are hereinafter described, and indicated in the claims.

Reference is to be made to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the elevator with its frame broken below the platform, the locking mechanism being in loosened adjustment to permit free reciprocal movement of the elevator-platform. Fig. 2 is a side elevation, partly sectional, of the device with the safety attachment in locked adjustment, holding the platform firmly secured to the uprights of the frame. Fig. 3 is a plan in section of the elevator-frame, taken on the line 3 3 in Fig. 1, showing the locking mechanism in loose adjustment; and Fig. 4 is a perspective view of one limb of the locking device detached from the elevator.

The frame A of the elevator consists of two upright oppositely-located parallel timbers; or metal beams may be used therefor. These frame-uprights are held spaced apart by the usual rectangular well-hole frames at each floor, one of said frames being shown broken off at *a* in Figs. 1 and 2. There are projecting tongues *b* formed upon the inner faces of the upright frame-timbers A, or these may be attached thereto, if preferred, said tongues being adapted to retain the platform or cage B in sliding contact with the upright frame-

timbers, there being grooved guiding-standards *c*, secured to the opposite sides of the platform B, which standards are connected at their upper ends by the transverse beam *d*. The grooves of the standards, having sliding contact with the guide-tongues *b*, retain the platform from lateral displacement, free to move vertically upon the frame.

Upon the transverse beam *d*, near its center of length, a heavy weight *e*, preferably in the form of a rectangular block, is suspended by two vertical parallel opposite limbs *f*, that are connected to the block by their lower ends, and so placed apart that they will loosely embrace the sides of the beam *d*, and be held from displacement by the plates *g*, which form keepers for the limbs *f*, and are secured to the beam by any suitable means. The upper ends of the limbs *f* are held connected by the parallel cross-bolts *h*, that pass through aligning perforations in the end portions of the limbs, and are therein secured by nuts on their ends. On the top bolt *h* a flexible rope C, preferably of wire, is attached, which extends over a pulley *i*, that is bracketed to the upper cross-timber A' of the frame, and thence the wire rope is led downwardly to an elevator-drum or other similar device actuated by hand or power, whereby the cage or platform B is suspended and controlled.

At the center of and beneath the platform B a strong bracket-frame *k*, having two spaced limbs, is attached, this bracket being secured to transverse timbers of the platform-frame. The space between the limbs of the bracket *k* is proportioned to receive the lapped bodies of the locking-arms *m* and permit them to vibrate freely. At the point where the arms *m* cross each other, which is near their longitudinal centers, said arms are reduced in thickness one-half, so that when the thinner portions of the arms are adjusted together in the form of a lapped pliers-joint the main portions of the same will have their sides level and parallel. The limbs of the bracket-frame *k*, which is designed to support the locking-arms *m*, are oppositely perforated at proper points, these holes being vertically elongated a proper degree to allow the transverse bolt or journal-pin *n* to slide

in the slot slightly when the arms are vibrated thereon. A short bend is produced in the arms near their lower terminals of such a degree as to align the rectangular enlargements *o* of said ends with the vertical adjacent faces of the frame-timbers A. The lower ends *o* of the crossed arms *m* are grooved on their faces to permit the same to loosely embrace the sides of the tongues *b*, the parallel flanges produced by the channels mentioned being designed to abut squarely against the main faces of the frame-timbers A when the arms *m* are adjusted to lock the platform B fast to said timbers, and to afford a surface which will not be liable to slip, and also to slightly cushion the impact of the arms thereon. A facing *o'* is secured upon the flanges of the ends *o*, which will engage the vertical timbers A when free to do so.

To afford means for automatically spreading the arms *m*, and consequently locking the platform B' from falling, two parallel bars *p* are employed. These are pivoted by one end of each to the depending spaced hangers *p'*, the flanges *p''* of which are secured to the under side of the platform-timbers. At the longitudinal centers of the bars *p* slightly-oblong orifices are formed, which extend longitudinally, so that these elongated orifices have their major axis at right angles to the vertically-elongated bolt-holes in the limbs of the hanger-bracket *k*, which carries the arms *m*, and as these holes cross each other it is evident that the bolt *n*, which passes through all, may slide a limited distance vertically and horizontally in the slots named, whereby free adjustment is afforded to the arms *m*, which are also engaged by said bolt *n*. It will be noticed that the upper ends *m'* of the arms *m* have a bearing or loose contact with the center timber of the platform-frame, which is necessary for the proper operation of the arms when adjusted to lock fast against the upright timbers A. Upon the beam *d* a low bracket-stand *r* is secured between the limbs *f* and one upright frame-timber A, upon which is pivoted the tripping-lever *s*, the point of pivoted support of which is nearer to one end, thus affording increased leverage to the long arm *s'* of this lever. At *s''*, near the terminal end of the short arm of the pivoted tripping-lever *s*, a connecting-rod *t* is loosely jointed thereto by its upper end, the lower end of the rod being fastened to a transverse spacing-bolt *p''*, which is secured to the free ends of the parallel bars *p*, and upon the same bolt a short lanyard *u'* is attached by one end. Its upper portion, engaging a bracketed pulley *u''*, hangs pendent therefrom, having a weighted handle-block *h'* on its terminal. A rope *u* is attached by one end to the terminal *s''* of the tripping-lever *s* and extended upwardly, engaging the bracket-supported pulley *u'*, thence to the similarly-supported pulley *u''*, which is attached to depend from the end of an outwardly-projected portion of the frame *v*, which latter may be a part of a well-hole

frame. From the pulley *u''* the rope *u* depends, it being extended downwardly through the building to the basement or lower floor close to the elevator.

On the end of the long arm *s'* of tripping-lever *s* a rod or wire rope *w* is fastened, which hangs pendent, it being of proper length to afford convenient means to depress this end of the lever manually by the occupant of the platform B. An elongated metal billet *w'*, being placed on or attached to the lower end of the rod *w*, serves to depress the end of the tripping-lever it is attached to when free to do so. It will be noticed that on account of superior weight the lower ends of the locking-arms *m* will drop sufficiently to remove their bearing-faces from square contact with the sides of the frame-timbers A, the slots in the parallel bars *p* and limbs of bracket *k* allowing such an adjustment to take place when the main hoisting-rope C is drawn and the elevator-platform B hoisted.

In explanation of the coacting adjustment of parts that effects a release of the locking-arms *m* from the frame guide-posts A when the platform is free to move, as shown in Fig. 1, the weighted block *e* is lifted by a draft upon the rope C until it engages the lower side of the transverse beam *d*, which will remove the lower cross-bolt *h* from contact with the long arm *s'* of tripping-lever *s*, thus permitting the ends of the parallel bars *p* by their connection thereto to rock the tripping-lever on its pivotal support, the depression of the ends of these bars being effected by the imposed weight of the locking-arms *m* and their own weight also. When the parts are in adjustment, as shown in Fig. 1, there is but little frictional resistance to the upward or downward movement of the platform B through the rope C, and in case the elevator is operated manually from the platform by draft on the rope C said platform can be stopped at any point by slacking the rope C and pulling on the weight *w'* or the handle-block *h'* on the lanyard *u'*, either of which will raise the free ends of the parallel bars *p* and spread the locking-arms *m*. In case other power is used which is located below the elevator, and the latter is employed for freight elevation, the rope *u* may be used to lock the platform B at any desired point when motion is arrested. If the main rope C is suddenly broken while the occupied elevator is being raised, the instantaneous fall of the heavy block *e* will permit the pendent counterbalancing weight or billet *w'* to fall, which in turn will lower the tripping-lever long arm *s'* and by its connection with the parallel bars *p* elevate their free ends, which will draw the crossed locking-arms *m* up, so that the enforced contact of their upper ends *m'* with the elevator-platform will spread them and force their lower ends against the guide-posts A, the weight of the released platform and load added rendering the contact of the arms more secure.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an elevator, two crossed and pivoted locking-arms supported loosely from the lower side of an elevator-platform with their upper ends free to slide outward upon the said lower side, and at their lower ends adapted to spread and engage frictionally the sides of the elevator-frame when the platform is falling, substantially as set forth.

2. The combination, with the vertical guides and the platform or cage, of two crossed pivoted locking-arms suspended from the lower side of said platform or cage with their upper ends in sliding contact with the said lower side and their lower ends extending adjacent to the respective guides and provided with clamping-faces, an operating-bar pivoted on the platform and connected with the pivot of said two arms, and means for operating said bar, whereby when the two arms are raised their upper ends will slide apart on the lower face of the platform to throw their opposite ends against the said guides, substantially as set forth.

3. The combination, with a frame having two parallel uprights that serve as guides, a platform which engages these guides, and a draft-rope for the platform, of two crossed pivoted locking-arms which are hung below from the platform with their upper ends in sliding contact with said platform and their lower ends adjacent to said guides, and devices which will spread the arms and cause their lower ends to clutch the frame-guides, substantially as set forth.

4. The combination, with an elevator-frame having two upright opposite parallel guides, a platform between the guides loosely engaged

therewith, upright standards on the platform that are connected by a transverse beam, a heavy weight pendent from the transverse beam and adapted to slide vertically a limited distance, and a draft-rope attached to this sliding weight, of a pair of crossed pivoted locking-arms hung below from the platform with their upper ends in sliding contact with the lower side of the platform and their lower ends adjacent to the respective guides, and devices which connect the weight above with the locking-arms below, whereby the latter are made to clutch the frame-guides when the platform falls at abnormal speed, substantially as set forth.

5. The combination, with two upright, opposite, and parallel guides of an elevator-frame, a sliding platform that has its upright standards in loose engagement with the guides, a vertically-sliding weight loosely supported by a cross-beam on these posts, an extended draft-rope which is attached to the sliding weight, and a tripping-lever pivoted near one of its ends upon the transverse beam of the platform guide-posts, of two pendent crossed and pivoted locking-arms which are hung below the platform-frame therefrom, two parallel bars having pivotal support at one end, and also near their center upon the bracket-limbs which carry the locking-arms, a connecting-rod between the free ends of the parallel bars and the short arm of the tripping-lever, and a pull rod or rope having a weight thereon which is pendent from the long arm of the tripping-lever, substantially as set forth.

PHILIPP SCHMIDT.

Witnesses:

CHARLES KURTENACKER,
ED ELDER.