(No Model.)

E. F. MOENNING & K. A. W. HAESELER.

SAFETY DEVICE FOR ELEVATORS.

No. 458,765. Patented Sept. 1, 1891.

Fig. 1.

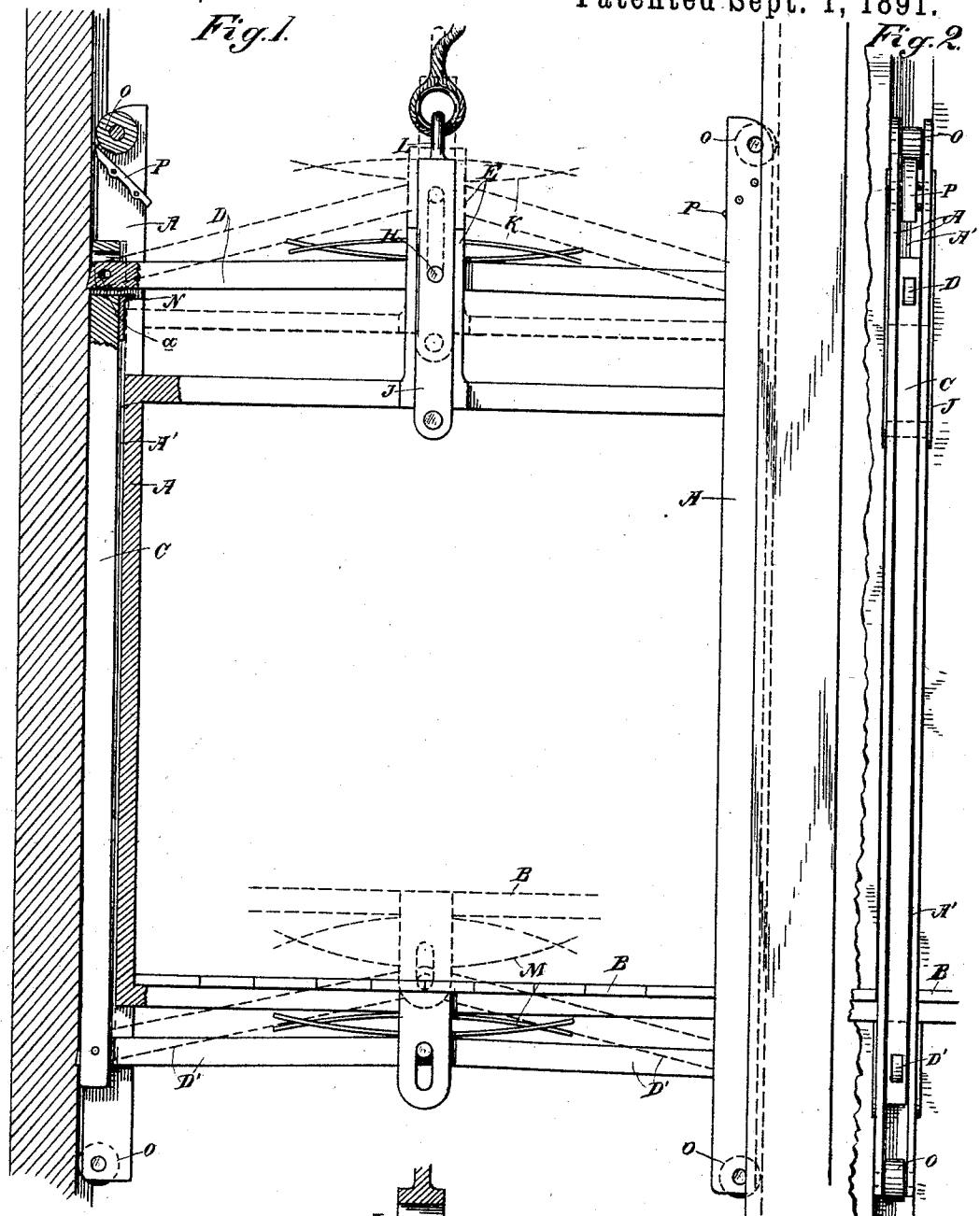
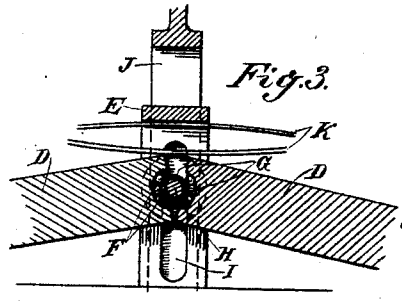


Fig. 2.

Fig. 3.



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SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 458,765, dated September 1, 1891.

Application filed April 22, 1891. Serial No. 390,041. (No model.)

To all whom it may concern:

Be it known that we, EMIL F. MOENNING and KARL A. W. HAESELER, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Safety Attachments for Elevator-Cages; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to a novel safety attachment for elevator-cages.

It consists in the combination, with the cage and the vertical guide-timbers thereof, of supplemental vertical bars fitting in grooves in the outer faces of the guide-timbers, said vertical bars being connected at top and bottom with angularly-disposed levers, by the action of which they are drawn toward the center or forced outward.

It further consists in the connection, with these levers, of the suspending-link, springs acting upon the levers when the link is released by breakage, and cushion-springs upon which the elevator-cage is received when the safety attachment is thrown into action, and in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation with section of one of the side timbers. Fig. 2 is an end view of the cage-frame. Fig. 3 shows the manner of joining the levers.

A A are the vertical side timbers of the elevator-cage, the platform of which is indicated in the present case at B. These side timbers travel in suitable guides, which extend vertically upon each side of the well within which the elevator moves. They may be made of any suitable or desirable material, as wood or iron. They are formed with grooves or channels A′, made in their outer faces, these grooves or channels being of sufficient width and depth to receive the vertical bars C and allow them to lie entirely within the grooves, so as not to form any frictional contact with the guides in which the elevator travels when the latter is properly suspended by its rope. The upper ends of the bar C are mortised or otherwise fitted to receive the outer ends of the levers D. The inner ends of these levers meet together and abut within a yoke E, which is fixed centrally to the top of the cage or the cross-beam which connects the two sides A. These meeting ends have semicircular grooves made in them, and within these grooves balls or rollers F are fitted, surrounding a sleeve G, which is of sufficiently smaller diameter to allow the balls or rollers to lie between the outside of the sleeve and the interior of the semicircular grooves or channels. Through the center of this sleeve a pin H passes, its ends extending out through slots I in the yoke and passing into holes in opposite sides of the link J, which is fitted to slide in guiding-channels formed upon each side of the yoke, as shown. The link J is considerably longer than the yoke, and when drawn downward until the pin is at the bottom of the slot in the yoke the lever-arms D will stand at a more obtuse angle than when at the highest point, the bar which unites the lower ends of the link then being considerably below the bar which connects the sides A of the cage.

Between the meeting ends of the lever-arms D and the top of the yoke inside are fitted the springs K. At the top of the link is a stout loop or eye L, into which the suspending-rope is fixed. When the weight of the cage is suspended by this rope, it will be seen that the link will be drawn up until its bottom bar is in contact with the top bar of the cage. The ends of the levers D will be drawn up toward the top of the yoke, and will thus compress and flatten the springs K between the top of the yoke and the top of the levers. These ends of the levers, having been drawn up in this manner, will draw the upper ends of the side bars inward, so that they lie within the sides of the vertical timbers A of the cage, and whenever for any reason the inner ends of these levers are pressed downward the outer ends will force the side bars C outward, and they will be correspondingly projected from their channels in the uprights A, so as to bind against the guides between which the elevator travels. The lower ends of the bars C are similarly connected by levers D′, the outer ends of which are united to them, while the inner ends meet and are connected in precisely the same manner as before described with the pin, the sleeve, and roller or ball

bearings outside the sleeve. By reason of this anti-frictional joint we insure the easy movement of all the parts upon each other and prevent their being in any way becoming clogged or prevented from having a free movement. The outer ends of the levers D and D′, where they pass through the mortises in the vertical bars C, have longitudinal slots made in them, as shown at *a*. Pins pass through the sides of the bars C and through these slots, and it will be manifest that the lever-arms D and D′ will be allowed to slide slightly through the slots or mortises in the bars. When by reason of the connection with the suspending-rope the inner ends of the lever-arms are drawn up to their highest point, their outer ends are drawn inwardly, so that they in no way touch or bind upon the guides between which the elevator travels; but when by any reason, as the breaking of the rope, the springs act to force these bars downward the ends will be first forced out through the vertical bars C, and, as these outer ends are slightly beveled, the lower angles being acute will engage with the sides of the guides. At the same time the slots in the levers are so short that the pins passing through them will act upon the side bars C, and they also will be forced out into frictional contact with the guides. The peculiarity of this construction is such that while the whole device is suspended by the rope and link so long as the rope remains intact, as soon as it becomes broken or from other reason the link is allowed to be forced down by the action of the springs above the lever-arms the latter project out and force the bars C into contact with the guides, and the whole apparatus is thereafter suspended by the frame-work consisting of the bars C and levers D and D′, while the cage is free to drop within this frame-work. As it drops down upon the top of the lower levers D′ the shock is relieved by means of the springs M, which are fixed between the top of the meeting ends of the lever D′ and the lower bar or floor of the cage. The outer ends of the levers D and D′ are slightly beveled, as shown, so that when the device is suspended and the centers of the levers drawn up to meet at the angle which they maintain in their normal condition the outer ends of these levers will be flush with or slightly within the outer faces of the vertical friction-bars C, but when they are released from the rope, so that the center of the bars D is forced downward by the action of the springs M, the ends of these levers will slide out by reason of the slot moving over the pin which connects them with the bars C, and these beveled ends will be forced out slightly beyond the bar C and take a positive hold upon the guides, the first action being that of the levers D at the upper end, and as the cage is then allowed to drop between these bars it acts upon the levers D′ at the bottom and forces them out in a like manner. This insures the engagement of the ends of both sets of levers with the guides, and in addition forces the bars C outward, so that they engage the guides with a strong frictional contact extending the whole length of the bars.

At the top and bottom of the side timbers A of the cage are fixed the anti-friction rollers O, the outer peripheries of which project just enough beyond the outer faces of the timbers A to form a rolling contact with the guides when the elevator is suspended and in its normal condition; but the action of the levers D and D′ will force the bars C outward beyond the line of these rollers whenever the levers are released.

In order to clear off any chips or accumulated dirt which may adhere to the guides we have shown the chisel-shaped scrapers P fixed in the timbers A just beneath the rollers O, having a beveled edge presented, so that when the cage is moving upwardly they will scrape off any accumulated dirt or plane off any small chips or broken wood which may have been formed by reason of the outer ends of the levers D being forced into the guides in checking the cage at any time.

N N are angle-plates fixed to the inside faces of the bars C just below the levers D and above the top bar of the cage. These angle-plates give increased bearing-surface beneath the outer ends of the levers, and the upper bar of the cage abuts against them, so as to give an even support at each end and keep it from contact with the ends of the levers.

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

1. In an elevator, the side timbers having grooves or channels made longitudinally in their outer faces, supplemental vertical bars fitting said grooves or channels, levers having their outer ends connected with said bars above and below the cage and their inner ends meeting centrally above and below the cage, a suspending-link connected with the meeting ends of the upper pair of levers, whereby the centers are drawn upward to meet at an angle and the connected vertical bars are allowed to drop downward and lie within the channels in the side timbers of the elevator, and a spring acting upon the meeting ends of these levers to force them downward and extend their outer ends and the side bars into contact with the guide-timbers of the elevator when said levers are released from the suspending device, substantially as herein described.

2. In an elevator, the longitudinally-channeled vertical side timbers, the supplemental bars fitted into said channels and adapted to lie within them and out of contact with the guide-timbers of the elevator-well, levers having their outer ends connected with the top and bottom, respectively, of these bars and their meeting ends jointed together, a yoke connected with the top of the cage, having guide-channels upon each side, a suspending-

link sliding in said guide-channels and having a bar at the bottom which engages and supports the top bar of the cage, a pin passing through the meeting ends of the levers, and corresponding holes in the sides of the link, slots in the sides of the yoke which allow said pin to travel up and down, so that the levers may be moved from an obtuse angle with each other when the side bars are forced outwardly to a greater angle when the bars are drawn into the channel in the side timbers, and springs fixed between the top of the yoke and the upper side of the meeting ends of the bars, whereby the latter are forced downward, so as to extend their ends and the side bars when the device is released from the suspending-rope, substantially as herein described.

3. In an elevator, the vertically-channeled side timbers, supplemental bars fitted to lie in said channels in the exterior of the timbers, levers above and below the elevator-cage, having their inner ends connected together, their outer ends extending through mortises in the side bars and beveled so as to engage the guide-timbers when forced outward, longitudinal slots made in these levers within the mortises of the side bars, and pins passing through the side bars and through these slots, whereby the ends of the levers may be drawn inward when the cage is suspended and allowed to extend slightly beyond the faces of the side bars when the levers and bars are forced outwardly, substantially as herein described.

4. In an elevator, the cage having the vertical side timbers channeled longitudinally in their outer faces, a flexible jointed supplemental frame-work consisting of side bars C, fitting in the channels of the side timbers of the elevator-car, levers D and D′ above and below the elevator-car, having their inner ends connected together with an anti-frictional joint and the outer ends pivoted to the supplemental side bars, yokes connected with the top and bottom of the cage, having slots through which the pins connecting the meeting ends of the levers extend, a link sliding in guides in the upper yoke, having an attachment at the upper end for the suspending-rope, and the pin connecting the upper levers extending through holes in its sides, springs fitted between the top of the yoke and the top of the upper levers, whereby the latter are forced downward and outward when released from the weight of the cage, and springs fixed between the bottom of the cage and the tops of the meeting ends of the lower levers, so that the cage may drop upon these springs when the side bars and levers have been forced out into frictional contact with the elevator-guides, substantially as herein described.

5. In an elevator, the combination of the vertically-channeled side timbers, supplemental bars fitting said channels, centrally-jointed levers above and below the car, the outer ends of which connect with the upper and lower ends of the supplemental bars, a suspending-link, springs acting upon the upper levers, and rollers journaled in the side timbers, with their peripheries projecting and traveling in contact with the guides while the cage is suspended, substantially as herein described.

6. In an elevator, the guides thereof and a cage or car, in combination with scrapers carried by the cage or car, having their edges acting against the guides to plane or smooth the same, substantially as herein described.

In witness whereof we have hereunto set our hands.

EMIL F. MOENNING.
KARL A. W. HAESELER.

Witnesses:
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H. F. ASCHECK.