(No Model.) 3 Sheets—Sheet 1.

F. W. VOERDE.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 262,861. Patented Aug. 15, 1882.

Fig. 1.

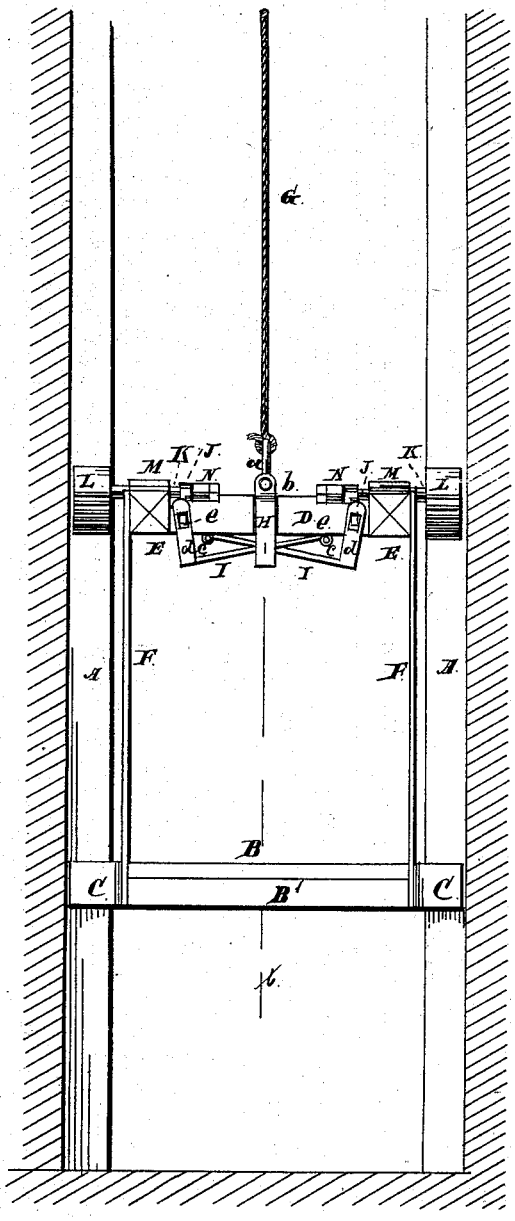
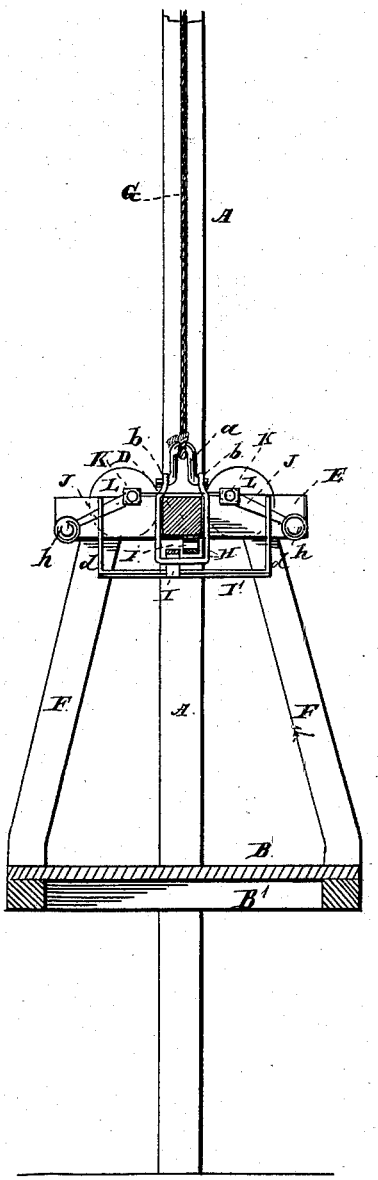


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3

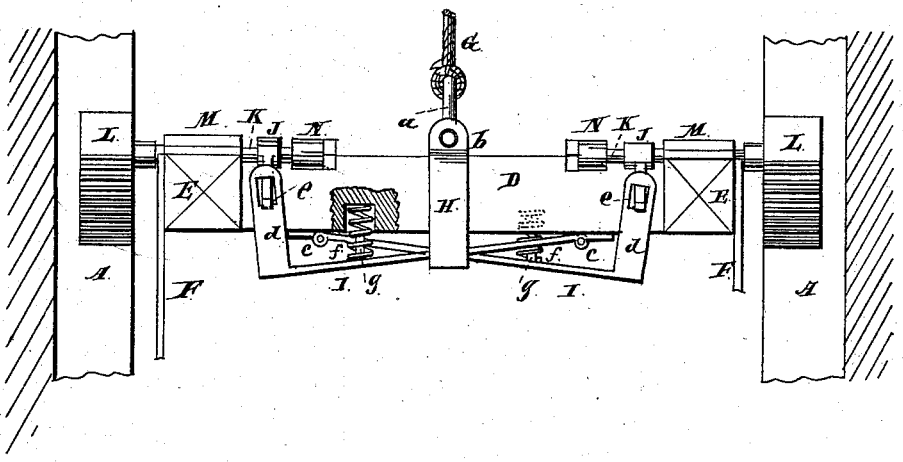
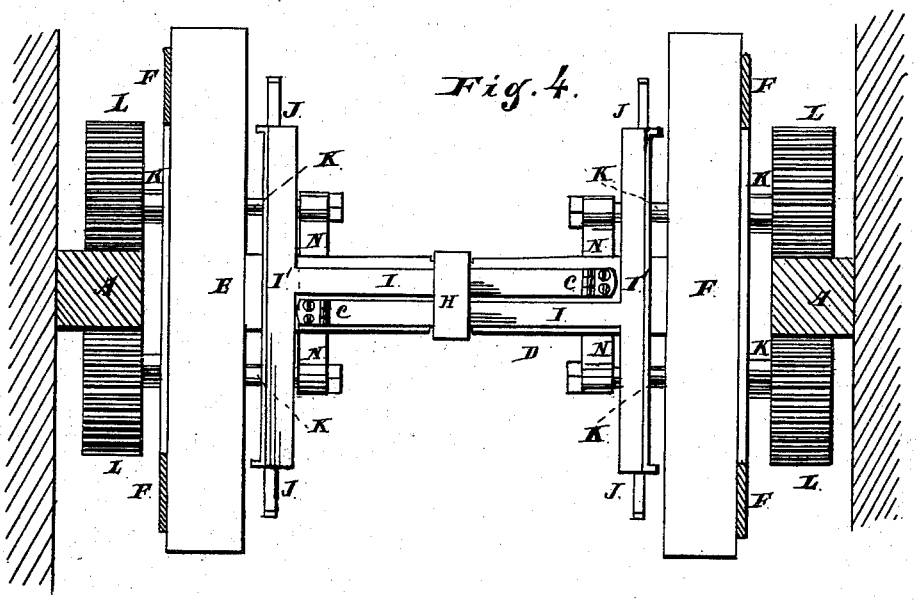


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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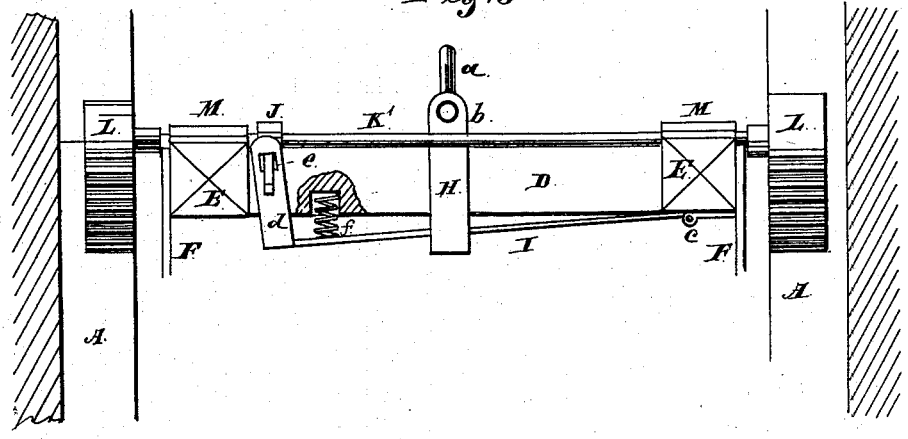
Fig. 5



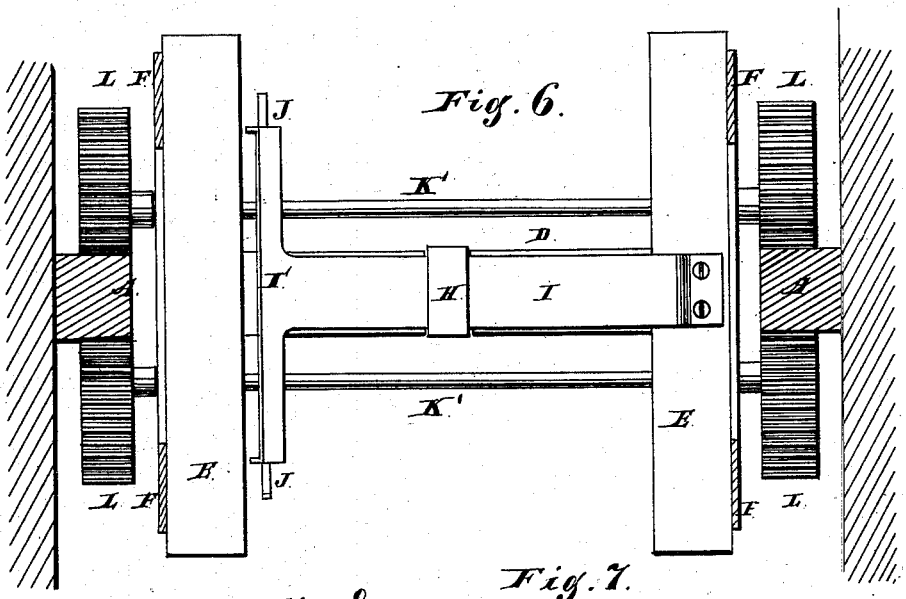


Fig. 6.

Fig. 7.

Fig. 8.

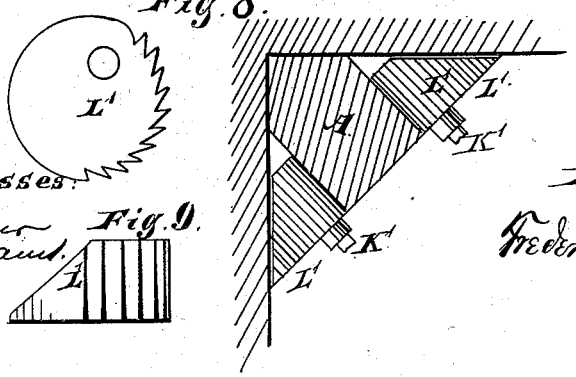


Fig. 9.

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UNITED STATES PATENT OFFICE.

FREDERICK W. VOERDE, OF CHICAGO, ILLINOIS, ASSIGNOR TO PETER J. SINGER, OF SAME PLACE.

SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 262,861, dated August 15, 1882.

Application filed May 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. VOERDE, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Safety Attachments for Elevators, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, showing the arrangement of the safety attachment when two lifting or controlling levers are used; Fig. 2, a vertical transverse section on line *x* of Fig. 1; Fig. 3, an enlarged detail, showing the arrangement of the stopping devices in connection with two lifting or controlling levers; Fig. 4, an under-side view of the parts shown in Fig. 3, with the guide-rails in section; Fig. 5, an enlarged detail, showing the arrangement of the stopping devices in connection with a single lifting or controlling lever; Fig. 6, an under-side view of the parts shown in Fig. 5, with the guide-rail in section; Fig. 7, a detail showing the arrangement of the eccentrics in connection with a corner guide-rail; Figs. 8 and 9, a side elevation and an edge view of the eccentric for the corner guide-rail.

This invention relates to safety attachments to be applied to elevators for the purpose of arresting or stopping the descent of the cage or platform in case of breakage of the hoisting-cable, or of slack of such cable from any cause, or other defect requiring the arrest or stoppage of the cage or platform, and has for its object to construct a safety attachment which can be readily applied to elevators of the ordinary construction, and which, when applied, will perform the work required in an efficient and reliable manner when needed. This object I accomplish by the mechanism illustrated and hereinafter described and claimed.

In the drawings, A represents the guide rails or bars; B, the bottom of the platform or cage, supported on a suitable frame-work, B′; C, guides or forks located one on each end of the bottom and straddling or forking the guide-rails A, as usual; D, the upper bar of the cage or platform; E, end bars, one attached to each end of the bar D; F, brace-bars securing the top and bottom of the cage or platform together. These parts represented by the letters A, B, B′, C, D, E, and F may be of the form of construction and arrangement shown, or of such other of the usual and well-known forms as may be desired.

G is the hoisting-cable, operating in the usual manner; H, a stirrup or hanger encircling the bar D, which, as shown, is notched on each side to receive the side straps or pieces of the stirrup and form guides therefor. As shown, the upper end of each side strap is bent inward slightly and forms ears *b*, in which is pivoted an eye or loop, *a*, to which the end of the hoisting-cable G is attached.

I represents lifting or controlling levers, two being used in the form of construction and arrangement shown in Figs. 1 to 4, inclusive. Each lever is formed of a main or body portion, with a cross-head or portion, I′, each end of which, as shown, is turned up to form an ear or support, *d*, in which is an opening or slot, *e*. The cross-head of each lever is formed with or attached to the lever, and the inner end of each lever is pivoted or hinged by a suitable connection, *c*, to the under face of the bar D. The connection of the lever is on the opposite side of the cage or platform to that of its working or free end, and the lever is of sufficient length to allow the free end the required amount of movement to do its work. These levers, when two are used, are located side by side and pass through the stirrup or hanger H, so that when the stirrup or hanger is raised the outer or free ends of each lever will be raised simultaneously, or nearly so, and to the same height.

J are arms or levers, four being used when two levers I are used, two on each end of the cage or platform, one on each side of the bar D, each passing through the slot or opening *e* in the ear or support *d*. The outer or free end of these levers may be provided with a ball or weight, *h*, as shown in Fig. 2, to assist in throwing them down, or a spring, *f*, may be arranged between the upper face of each lever I and the under face of the bar D, as shown in Fig. 3, to throw down the outer ends of the levers I and depress the arms or levers J. The lower end of the spring may be located around a stud or pin, *g*, on the lever I, and its upper

end may be inserted in a socket or hole in the bar D, as shown in Fig. 3, or the spring may be connected and held in position in some other suitable manner; and in place of using a coiled spring, as shown, a flat spring arranged to bear against the lever may be used, one end of the spring being attached to the bar D, so as to have its free end bear properly on the lever.

K are rods or shafts, four being used when four arms or levers J are used, to which the inner end of the arm or lever is attached in any suitable manner to have its rise and fall rock the rod or shaft to which it is attached.

L are eccentrics, secured one to each outer end of the rods or shafts K, so as to bring an eccentric on each side of each guide-rail A, and in such relation to the guide-rail as to be held clear thereof, or be brought in contact therewith, by rocking and holding the shafts K in the proper direction. As shown, these eccentrics have the edge or face which engages with the guide-rail serrated, for the purpose of producing a firmer and stronger bite when the eccentrics are brought into contact with the rails.

M are journal bearings or boxes, one for each shaft or rod K, secured in any suitable manner to the upper face of the end bars, E, to bring the shafts in proper position for the eccentrics in relation to the guide-rails.

N are bars or arms attached to the upper face of the bar D, and having on each end a box or journal to receive and support the inner end of the shafts or rods K. Other means than these bars or arms N could be used to support the inner ends of the shafts.

The arms or levers J are arranged in such relation to the eccentrics L that when the arms or levers are raised the eccentrics will be held out of contact with the guide-rails, and when these arms or levers are depressed or thrown down the eccentrics will be turned so as to bring them into contact or engagement with the face of the guide-rails, and, if desired, the connection of the arms or levers through their rods or shafts may be adjustable to bring the arms or levers in proper position to cause them to act and hold the eccentrics out of contact, or bring them into contact with the guide-rails, the connection, however, being one by which, when the arms or levers are adjusted properly, they can be locked firmly with the rock-shafts or rods, or the connection of the arms or levers with the rods or shafts can be made permanent, and the eccentrics be connected adjustably with a connection by which they could be locked firmly when adjusted to the rods or shafts.

The operation is as follows: When the cage or platform is working properly the hoisting-cable will be taut or strained, drawing up the stirrup or hanger H, raising the outer or free ends of the levers I, keeping the eccentrics L clear of the guide-rails, so that the cage or platform is free to ascend and descend without interference from the eccentrics; but if the cable breaks or becomes slack from any cause the stirrup or hanger H at once drops, allowing the outer or free ends of the levers I to drop, throwing down the arms or levers J, and turning or rocking the rods or shafts K, bringing the eccentrics into contact or engagement with the guide-rails, which stops the descent of the cage or platform, and prevents any falling thereof.

As shown in Figs. 5 and 6, a single lever I is used instead of two, and a single set of arms or levers J are employed instead of two sets, and in this form of construction rods or shafts K′, extending across the cage or platform, and having on each end an eccentric, L, are used, a rod or shaft being placed on each side of the bar D, as shown, mounted in suitable bearings, M, on the end bars, E. The operation of this form of construction is the same as that described where two levers I are employed, the lever I, when its outer end is elevated, holding the eccentrics out of contact through the arms or levers J, and when the cable fails, from breakage or other cause, the outer end of the lever I drops, throwing down the levers J, forcing the eccentrics into contact with the guide-rails.

Some elevators have the guide-rails located and arranged at diagonal corners of the cage or platform, and for this form of construction the devices described can be used to operate the eccentrics; but the eccentrics will have to be of a peculiar form in order to be located so as to work, and this form is shown in Figs. 7, 8, and 9 represented by the letter L′. It is necessary, in order to produce a firm bite, that the engaging face of the eccentric should have a bearing-face of some considerable width, and if the eccentric were left of this same width it would be impossible to insert it in the space formed between the guide-rail and the wall of the elevator-way and leave sufficient bearing-surface to insure a stoppage. This defect is obviated by using an eccentric of the form shown in Figs. 7, 8, and 9, in which the face of the eccentric which lies adjacent to the wall of the elevator-way is cut diagonally, forming a face, which, when the parts are in place, stands parallel with the wall, so that the bearing-surface of the required width is brought to bear against the guide-rail, and the eccentric is free to turn or be turned so as to clear the guide-rail or be brought in contact therewith. The operation of the eccentric will be the same as that described for the forms of arrangement shown in Figs. 1 to 6, inclusive.

As shown, double sets of eccentrics are provided with actuating devices therefor; but it is evident that one set could be used working in connection with sliding guides on the opposite side of the guide-rails, and that instead of using two shafts K′, or four shafts K, a single shaft K′ and two shafts K could be used with beneficial and good results.

As shown, the rock-shafts are mounted on top of the upper frame-work; but it is evident

that they could be located underneath such frame-work, the bearings M being secured to the under side of the end pieces, E.

When the shafts and arms or levers J are located below the frame-work the ears or supports *d* on the ends of the cross-heads I′ will depend or hang down so as to engage and support the levers J, but that is the only change required.

It is also evident that the devices could be applied to the bottom of the cage or platform, suitable connecting-rods being provided for the attachment of the cable, and when so used the cross-heads I′ should have depending lips or supports *d*, the same as when the attachment is made to the under side of the upper frame.

Some other form and arrangement of stirrup or hanger than that shown could be used to support the levers or lever I, so long as it would operate to raise the levers or lever when the cable is acting and allow such levers to drop in case the cable becomes non-acting.

The weights *h* alone could be used for throwing the arms or levers J down, or the springs *f* alone could be used for this purpose, or both weights and the springs could be used, if desired.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a safety attachment for elevators, a lifting or controlling lever, pivoted at one end and provided at its other end with a cross-head, in combination with a device adapted to come in contact with a rail or bar and connected with the cross-head on the lifting or controlling lever and means for operating the latter, substantially as described.

2. The combination of a lifting or controlling lever, pivoted at one end and provided at its other end with a cross-head, with an eccentric adapted to come in contact with a rail or bar and connected with the cross-head on the lifting or controlling lever and means for operating the latter, substantially as described.

3. The combination of a lifting or controlling lever, pivoted at one end and provided at its other end with a cross-head, with an eccentric adapted to operate on a rail or bar, a rock-shaft connected with the eccentric, a connecting device between the rock-shaft and the cross-head on the lifting or controlling lever, and means for operating the latter, substantially as described.

4. The combination of a lifting or controlling lever, pivoted at one end and provided at its other end with a cross-head, with an eccentric adapted to operate on a rail or bar, a rock-shaft connected with the eccentric, an arm or lever attached to the rock-shaft and connected with the cross-head on the lifting or controlling lever, and means for operating the latter, substantially as described.

5. The combination of a lifting or controlling lever, pivoted at one end, an eccentric adapted to operate on a guide rail or bar, devices connecting the eccentric with the controlling lever, and a stirrup supporting the lifting and controlling lever, substantially as described.

6. The combination of two lifting or controlling levers, each pivoted at one end and provided at the other end with a cross-head, with devices adapted to operate against rails or bars and connecting with the cross-heads on the lifting or controlling levers, and means for operating the latter, substantially as described.

7. The combination of two lifting or controlling levers, each pivoted at one end and provided at the other end with a cross-head, with eccentrics adapted to operate against rails or bars, devices connecting said eccentrics with the cross-heads on the lifting or controlling levers, and means for operating the latter, substantially as described.

8. The combination of two lifting or controlling levers, each pivoted at one end and provided at the other end with a cross-head, with eccentrics adapted to operate on rails or bars, rock-shafts connected with the eccentrics, devices connecting the rock-shafts with the cross-heads on the lifting or controlling levers, and means for operating the latter, substantially as described.

9. The combination of two lifting or controlling levers, each pivoted at one end and provided at the other end with a cross-head, with eccentrics adapted to operate on rails or bars, rock-shafts connected with the eccentrics, arms or bars attached to the rock-shafts and connected with the cross-heads on the lifting or controlling levers, and means for operating the latter, substantially as described.

10. An eccentric, L′, having a diagonal face for enabling it to be used on guide-rails located at diagonal corners of the case or platform, substantially as and for the purposes described.

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