No. 858,247. PATENTED JUNE 25, 1907.

R. E. ACKLEY.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED AUG. 22, 1906.

5 SHEETS—SHEET 1.

Fig. 1.

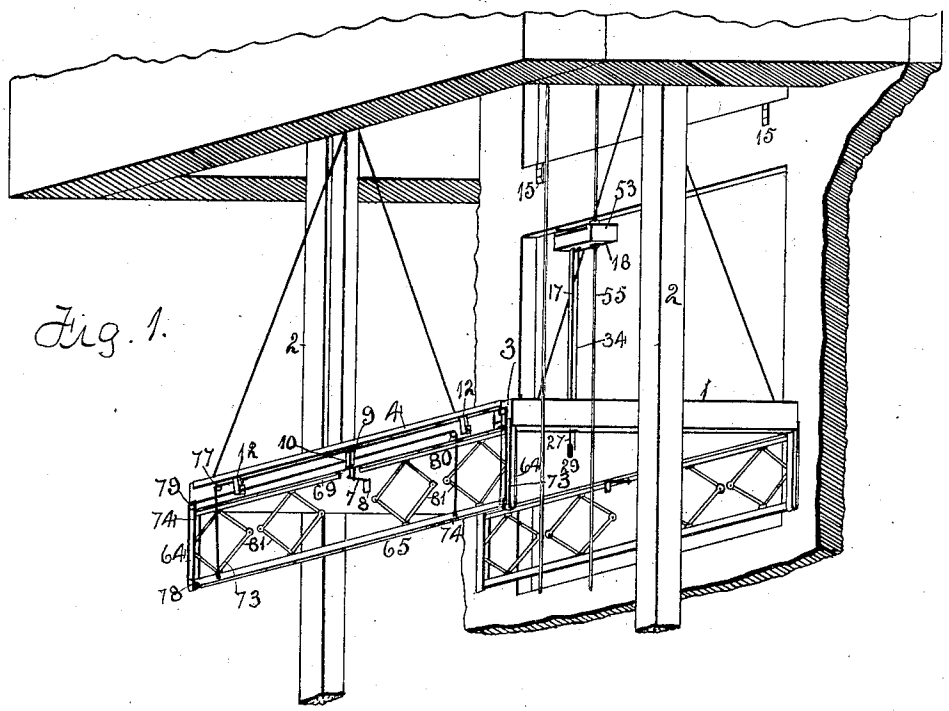

Fig. 2.

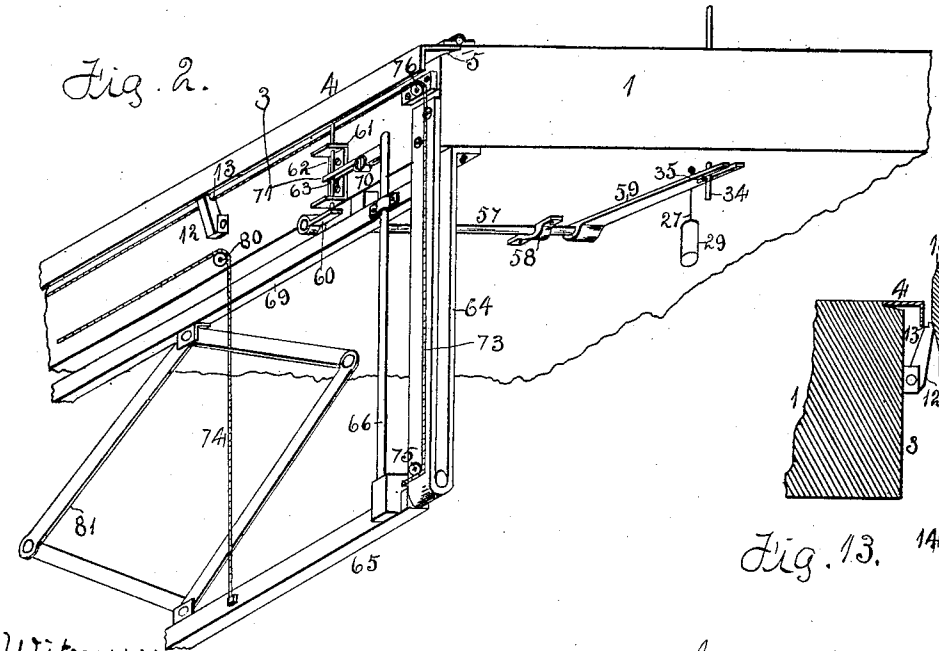

Fig. 13.

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5 SHEETS—SHEET 2.

Fig. 3.

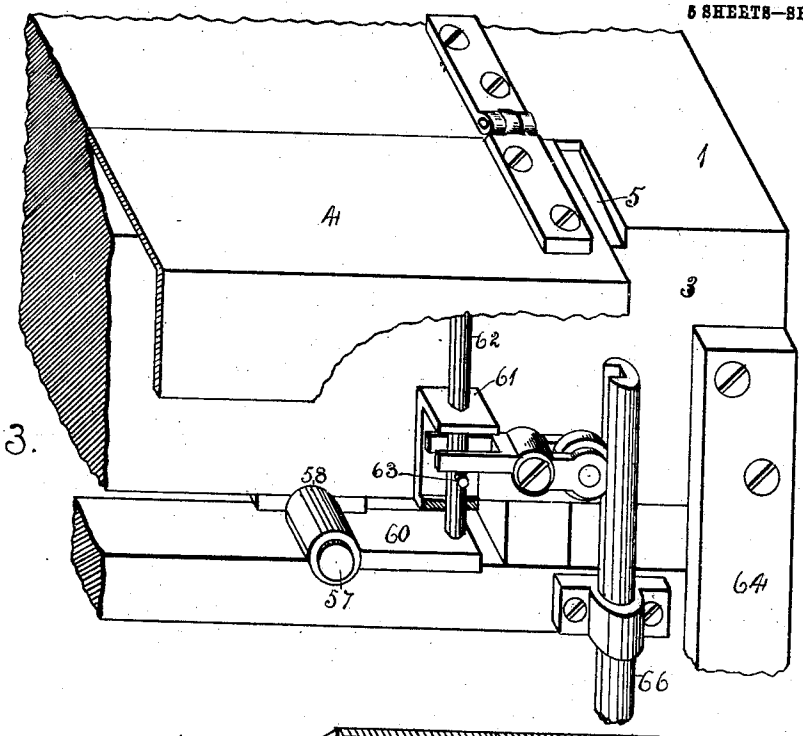
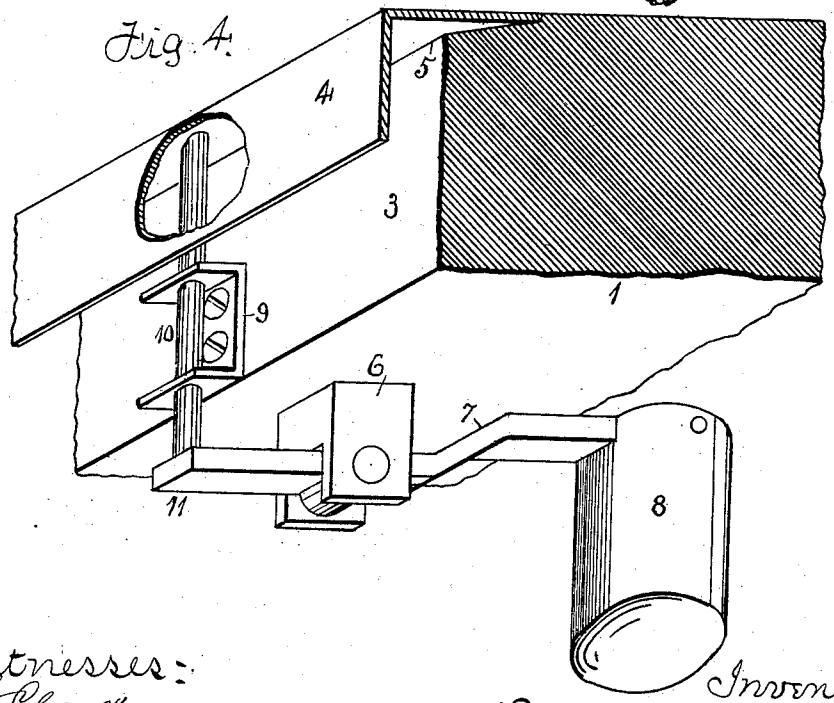


Fig. 4.



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5 SHEETS—SHEET 3.

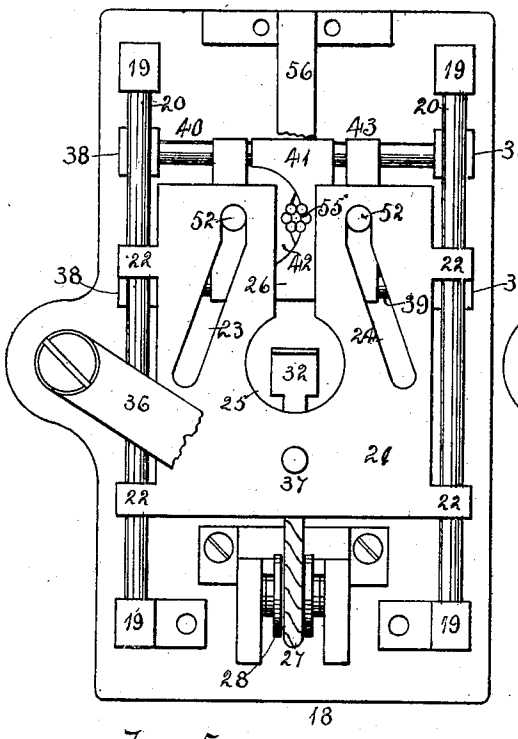


Fig. 5.

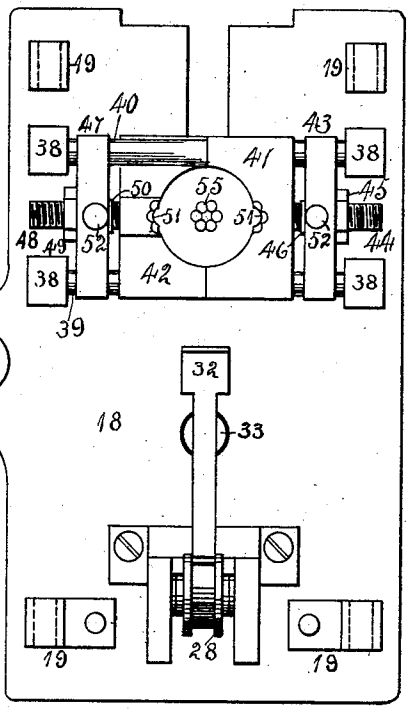


Fig. 6.

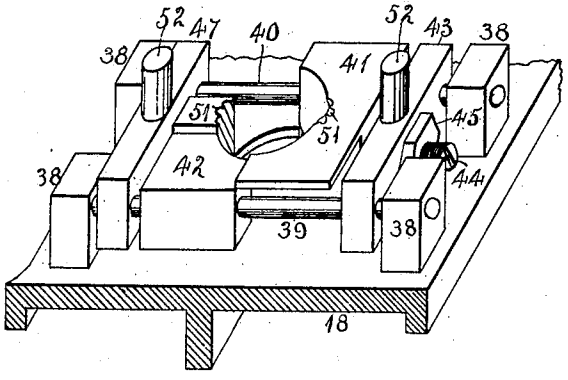


Fig. 9.

Fig. 10.

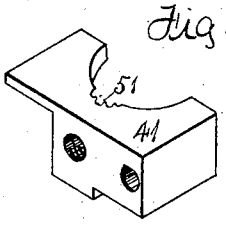
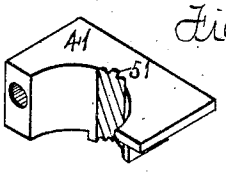


Fig. 11.



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5 SHEETS—SHEET 4.

Fig. 7.

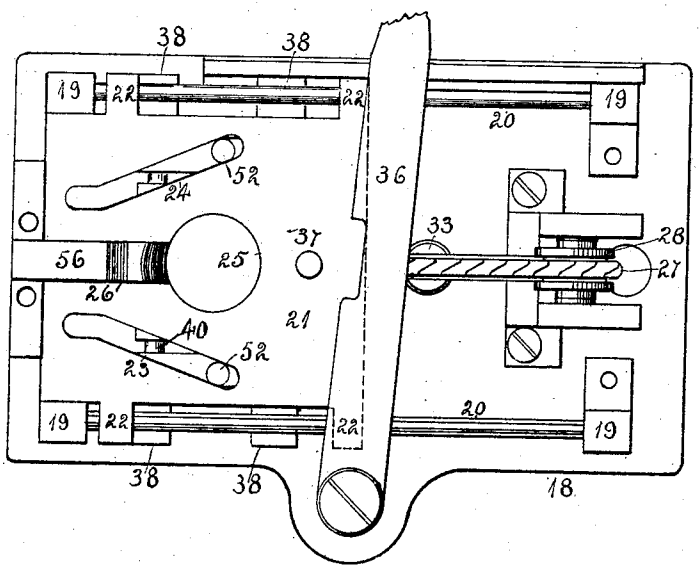


Fig. 14.

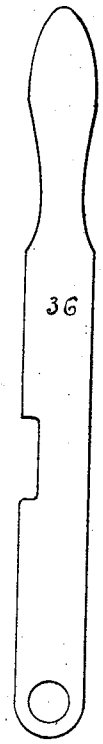
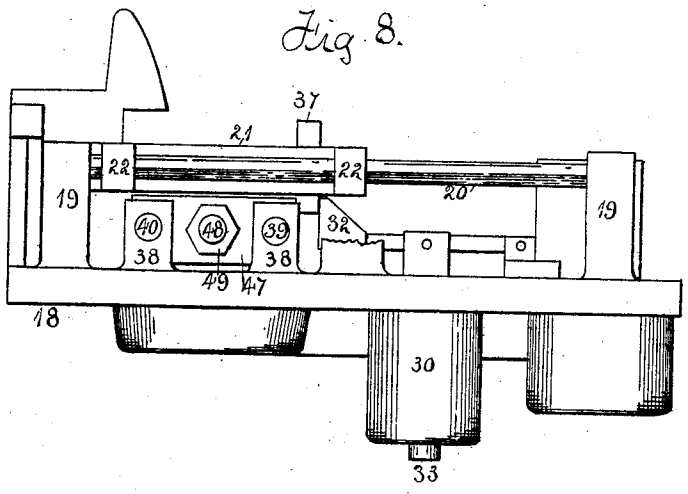


Fig. 8.



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5 SHEETS—SHEET 5.

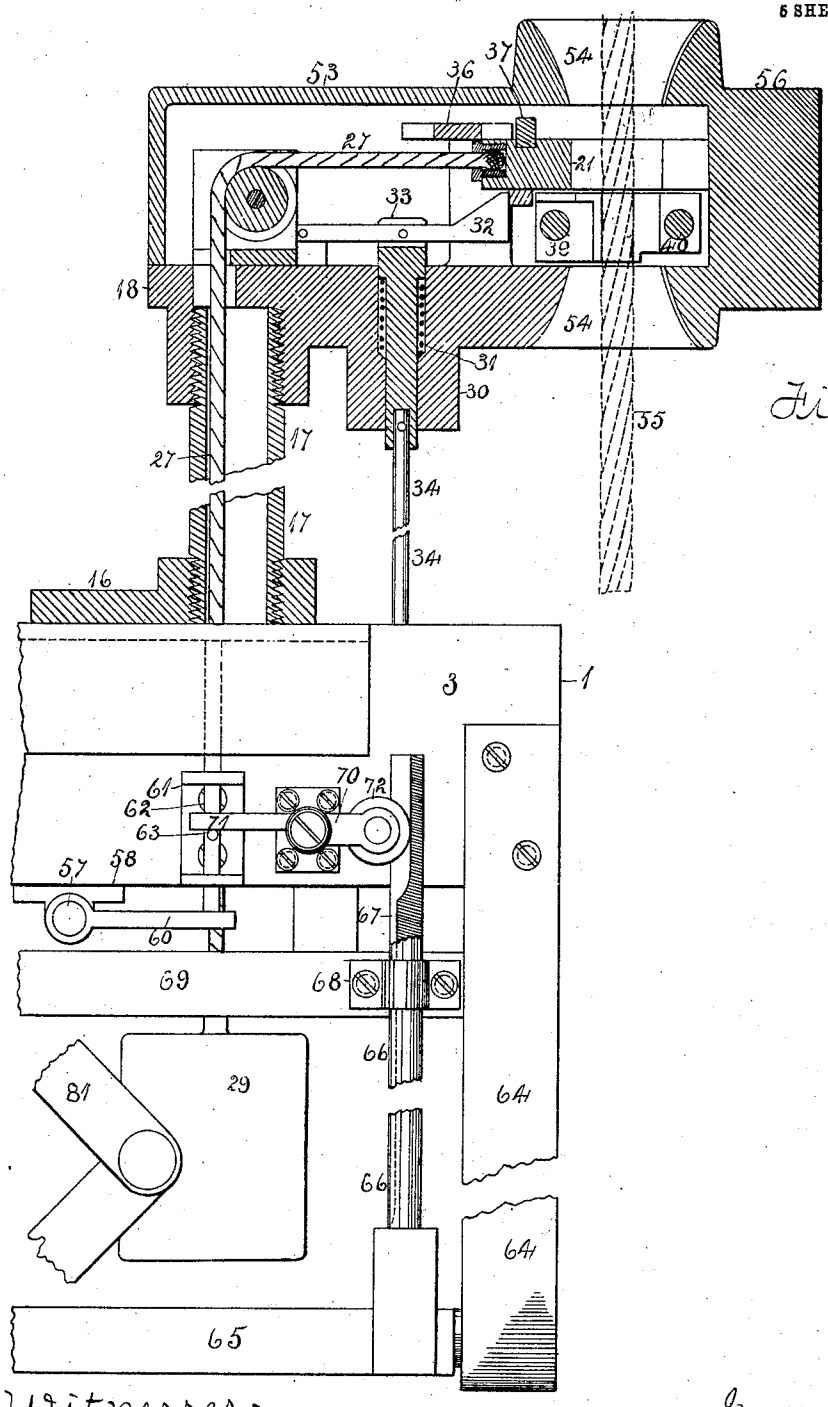

Fig. 12.

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UNITED STATES PATENT OFFICE.

RAYMOND E. ACKLEY, OF ROCKFORD, ILLINOIS.

SAFETY DEVICE FOR ELEVATORS.

No. 858,247. Specification of Letters Patent. Patented June 25, 1907.

Application filed August 22, 1906. Serial No. 331,664.

To all whom it may concern:

Be it known that I, RAYMOND E. ACKLEY, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

The object of this invention is to provide a safety device for elevators, in which the elevator is automatically stopped should a person be caught between the edge of the elevator and floor.

In the accompanying drawings, Figure 1 is a perspective view of an elevator in which portions of the shaft are broken away. Fig. 2 is a perspective view of a section of the elevator with certain portions of my improvements in connection therewith. Fig. 3 is a perspective view of a portion of the elevator and the mechanism for releasing the gripping jaws for the rope 55. Fig. 4 is a perspective view of a portion of an elevator and the mechanism for counterbalancing the weight of the yielding edge plate. Fig. 5 is a plan view of the mechanism for gripping the rope 55 in which the rope is gripped. Fig. 6 is a plan view of the mechanism for gripping the rope 55 in which some of the parts are removed. Fig. 7 is also a plan view with the parts in their normal positions. Fig. 8 is an elevation of the mechanism for gripping the rope 55. Fig. 9 is a perspective view of the jaws of the rope gripping mechanism in connection with their supports. Figs. 10 and 11 are perspective views of one of the rope gripping jaws. Fig. 12 is an elevation of a portion of an elevator, and a vertical central section through the parts located above the elevator and supported thereby. Fig. 13 is a vertical section of a portion of the elevator platform and floor frame showing the device for holding the guard 4 in position. Fig. 14 is a top view of lever 36.

The elevator platform 1 is guided by the uprights 2 in the usual manner. My improvements are shown to be operated from one edge of the elevator platform but when the elevator is used from both sides the improvements can be arranged to operate a common rope gripping jaw.

To the edge 3 of the platform 1 is hinged an angle-plate 4 forming a guard. The edge of the platform is formed with a cut-away portion 5 to receive it and also to permit it to have a vertical movement. To the underface of the platform is secured a support 6 to which is pivotally connected a bar 7 about midway of its length. One end of this bar 7 has a weight 8 connected to it. To the edge of the platform 1 is secured a support 9 provided with vertical openings. A rod 10 is located in the openings of the support 9 and its lower end rests on the end 11 of the bar 7. The guard 4 rests on the upper end of the rod 10 and the weight 8 serves to counterbalance the weight of the guard. The support 6 for the bar 7 acts as a stop to the upward movement of the end 11 of the bar. To the edge 3 of the platform 1 is pivoted a latch 12 having a notch 13 in its upper edge. The frame 14 around the elevator has a cam surface 15 connected to it, and is located near a landing. As the elevator platform approaches a landing the upper end of the latch is moved by engaging the cam-surface so that the guard 4 is received by the latch, which prevents the guard from descending in order that trucks and foot passengers may pass over the guard without operating the safety devices. After the platform has passed the landing the latch will be liberated thereby permitting the guard to be moved.

To the upper face of the platform is secured a plate 16 and to which is connected a pipe 17. To the upper end of this pipe 17 is connected a base-plate 18 which supports the rope gripping mechanism. From the upper face of the base-plate extend four corner projections 19. Two rods 20 are supported by these projections and extend parallel with one another, and located near the edge of the base-plate. These rods support a slidable plate 21 by the rods passing through ears 22 extending from the plate. This slidable plate is provided with two cam-shaped openings 23 and 24 extending in the lengthwise direction of the plate but diagonally thereto. A central opening 25 is formed in the slidable-plate, and has a portion 26 extending to the end of the plate. A cable 27 has one end connected to the slidable-plate, passes over a sheave 28 supported by the base-plate and depends through the pipe 17 also through the platform and to its lower end is connected a weight 29.

From the underside of the base-plate 18 depends a projection 30 which is recessed in its upper portion and within which is located a coiled spring 31. A dog 32 has a pivotal connection with the upper face of the base-plate and when the slidable-plate is farthest

from the sheave 28 the dog 32 will engage it and hold it from movement. A section of rod 33 has a pivotal connection with the dog 32 and extends downward through the coiled spring 31. The action of the coiled spring upon the rod 33 is to hold the free end of the dog 32 elevated so that the slidable-plate may engage it.

To the section of rod 33 is connected a rod 34 which extends downward through the elevator platform and has a pin 35 extending transversely through it. When the rod 34 is pressed down it will move the dog 32 free of its engagement with the slidable-plate which will allow the weight 29 to move the slidable-plate from the position shown in Fig. 7 into the position shown at Fig. 5.

A lever 36 has a pivotal connection with the base-plate 18. A pin 37 extends from the upper surface of the slidable-plate 21. By means of the lever 36 coming in contact with the pin 37, a further movement of the lever will restore the slidable-plate into the position shown at Fig. 7.

From the upper face of the base-plate extend four studs 38 which support two rods 39 and 40 located parallel with one another. These rods support two jaws 41 and 42 in a manner to slide thereon. A plate 43 has a slidable engagement with the rods 39 and 40 and a screw 44 has a screw-thread connection with the jaw 41 and passes through an opening in the plate 43. A nut 45 has a screw-thread connection with the screw 44. This screw 44 has a collar 46 which bears against the face of the plate 43 next to the jaw 41 which holds the screw against lengthwise movement. By turning the screw 44 the jaw 41 can be moved relatively with respect to the plate 43 and clamped in its adjusted position by the nut 45. The jaw 42 is provided with a similar arrangement for accomplishing its adjustment and consists of the plate 47, screw 48, nut 49 and collar 50 which operate in the same manner as like parts of the jaw 41. Each of the jaws 41 and 42 has a serrated concave face 51. The serrated face of one jaw facing the face of the other jaw. From each of the plates 43 and 47 extends a pin 52 which is located in the cam-grooves 23 and 24 of the slidable-plate 21. As the slidable-plate 21 moves, the pins 52 will be moved toward and from one another which will move the jaws 41 and 42 toward and from one another for a purpose to appear hereinafter.

A covering 53 is placed over the operative parts supported by the base-plate 18. The covering 53 and base-plate 18 are each formed with an opening 54 for the reception of a rope 55. A removable section 56 is fitted to the base-plate 18 and closes the opening in the base-plate and covering, and holds the rope 55 within the openings 54 of the parts. By making the section 56 removable, the rope 55 can be disengaged from the parts without disturbing its end connections.

To the underface of the elevator platform 1 is supported a shaft 57 by the brackets 58 in a manner to permit it to rock. To the inner end of this shaft 57 is secured an arm 59 having its free end forked which receives the rod 34 above the pin 35. The outer end of the shaft 57 has a projection 60 so that it will rock with the shaft. A support 61 secured to the face of the platform 1, and guides a rod 62 in a manner to permit it to move vertically. This rod has a pin 63 extending transversely through it.

When the guard 4 is depressed by the weight of a person resting on it, the rod 62 will be depressed and its lower end rests on the projection 60, the shaft 57 will be rocked, which will move the arm 59, and its engagement with the rod 34 will move the rod downward and release the dog 32 which will permit the weight 29 to move the slidable plate 21, and it in turn will cause the jaws 41 and 42 to close around the rope 55, and as the elevator continues to move, it will move the rope a short distance and stop the elevator platform. When the weight has been removed from the guard, by means of the lever 36, the slidable-plate 21 can be restored to its normal position, which will cause the jaws 41 and 42 to separate and release the rope.

To the edge of the elevator platform and at each corner thereof are secured two loops 64 which depend below the lower edge of the platform. A guard 65 has rounded ends supported in the loops 64 in a manner to permit the guard to move vertically and guided by the loops. A rod 66 is provided with a vertical groove 67, the upper portion of which is cut deeper as shown at Fig. 12. This rod is guided in a bracket 68 secured to a bar 69 located beneath the elevator platform. The lower end of the rod 66 is forked, and straddles the guard 65. To the edge of the elevator platform is pivoted a lever 70, one end 71 being forked and straddling the rod 62 above the pin 63, and its other end supporting a roller 72. This roller 72 is located in the groove 67 of the rod 66.

To the guard 65 is connected two cables 73 and 74. The cable 73 passes over rollers 75, 76 and 77, and the cable 74 passes over rollers 78, 79 and 80. This arrangement of cables will suspend the guard 65 so that it will be held parallel with the platform should it be arrested by coming in contact with a person at any point of its length, and the platform continuing to descend.

The links 81 connect the guard 65 with the bar 69. Should the guard 65, when the elevator is descending strike an obstruction, as the body of a person, the platform would descend until the roller 72 enters the main section of the groove 67 of the rod 66 when it

will rock the lever 70 on its pivot and cause its other end to strike the pin 63 and pull down on the rod 62 which will operate the dog 32 the same as if operated by the guard 4.

By this construction of safety devices for elevators should a person fall on the guard 4 while the elevator is descending, it would be automatically stopped before the person would be carried up against the ceiling, and should a person fall in the path of the guard 65, the elevator would be automatically stopped before the platform would come in contact with him.

I claim as my invention.

1. A safety device for elevators comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, means whereby the jaw is liberated by a movement of the guard, a slidable plate having a cam groove, a pin extending from the jaw and located in the cam-groove, and means for moving the slidable plate in both directions.

2. A safety device for elevators comprising a platform, a yielding guard, two movable jaws adapted to grip a rope, means whereby the jaws are liberated by a movement of the yielding guard, a slidable plate having two cam grooves, a pin extending from each jaw and located in a cam groove, and means for moving the slidable plate in both directions.

3. A safety device for elevators comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, a slidable plate, a connection between the plate and jaw, a dog holding the plate against movement, a connection between the dog and yielding guard, and means for moving the plate when liberated.

4. A safety device for elevators, comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, a movable plate, a connection between the plate and jaw, means holding the plate against movement, a connection between the holding means and yielding guard, and means for moving the plate when liberated.

5. A safety device for elevators, comprising a platform, a yielding guard, two independent jaws movable toward and from each other and adapted to grip a rope between them, a movable plate, a connection between each jaw and the plate, means holding the plate against movement, a connection between the plate and yielding guard and means for moving the plate when liberated.

6. A safety device for elevators comprising a platform, a yielding guard, a jaw slidable on suitable supports and adapted to grip a rope, a movable plate, a connection between the plate and jaw, means holding the plate against movement, a connection between the holding means and yielding guard and means for moving the plate when liberated.

7. A safety device for elevators comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, means whereby the jaw is liberated by a movement of the yielding guard, a slidable plate having a cam groove extending diagonal to the length of movement of the plate and a portion extending in the direction of the movement of the plate, a pin extending from the jaw and located in the cam groove and means for moving the slidable plate in both directions.

8. A safety device for elevators comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, means whereby the jaw is liberated by a movement of the yielding guard, a movable plate, a connection between the plate and jaw, means holding the plate against movement, means for moving the plate in both directions and a lever for moving the plate in one direction.

9. A safety device for elevators comprising a platform, a yielding guard, a movable jaw adapted to grip a rope, means for adjusting the jaw bodily toward and from the rope, means holding the jaw against movement, a connection between the holding means and yielding guard, and means for moving the jaw in both directions.

10. A safety device for elevators comprising a platform, a yielding guard located adjacent the edge of the platform, a support pivotally connected to the platform and a stationary cam surface with which the support engages for moving the support beneath the yielding guard.

11. A safety device for elevators comprising a platform, a yielding guard located adjacent to the edge of the platform, an arm pivoted to the platform, a weight connected to one end of the arm and the other end of the arm having an engagement with the yielding guard by which the weight of the yielding guard is counterbalanced.

12. A safety device for elevators comprising a platform, two guards, one located adjacent to the upper edge of the platform and the other located adjacent to the lower edge of the platform, a movable jaw adapted to grip a rope, a movable plate a connection between the jaw and plate, means holding the plate against movement, means for moving the plate in both directions, and a connection between both yielding guards, and the holding means.

13. A safety device for elevators comprising a platform, two yielding guards, one located adjacent to the upper edge of the platform and the other located adjacent to the lower edge of the platform, a movable jaw adapted to grip a rope, means holding the jaw against movement, a vertical slidable rod having one end located beneath the upper yielding guard, a connection between the rod and holding means, a connection between the lower yielding guard and rod, and means for moving the jaw in both directions.

14. A safety device for elevators compris-

ing a platform, a yielding guard located adjacent to the upper edge of the platform, a movable jaw adapted to grip a rope, means holding the jaw against movement, a horizontal rock shaft supported beneath the platform, a vertical movable rod supported by the platform having one end located beneath the upper yielding guard, an arm extending from the rock shaft upon which the lower end of the rod rests, a connection between the rock shaft and holding means, and means for moving the jaw in both directions.

15. A safety device for elevators, comprising a platform, two yielding guards, one located adjacent to the upper edge of the platform and the other located adjacent to the lower edge of the platform, a movable jaw adapted to grip a rope, means for holding the jaw against movement, a horizontal rock shaft supported beneath the platform, a vertical movable rod supported by the platform having one end located beneath the upper yielding guard, an arm extending from the rock shaft upon which the lower end of the rod rests, a connection between the rock shaft and holding means, and means for moving the jaw in both directions.

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