

J. F. KING & J. P. NEARY.
 AUTOMATIC STOP OR SAFETY DEVICE FOR ELEVATORS.
 APPLICATION FILED MAR. 22, 1913.

1,090,918.

Patented Mar. 24, 1914.

3 SHEETS—SHEET 1.

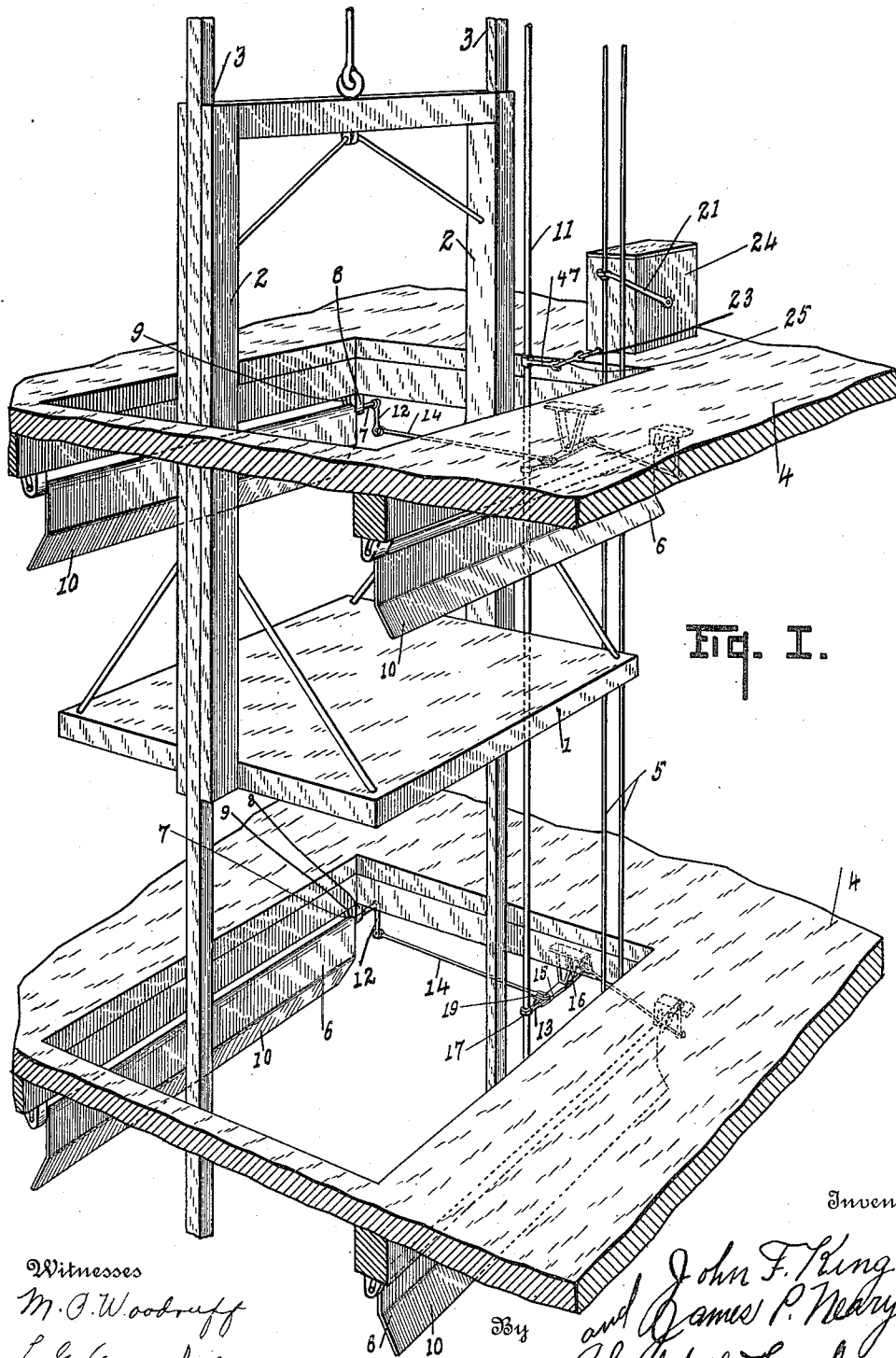


Fig. I.

Witnesses
 M. C. Woodruff
 L. G. Greenfield

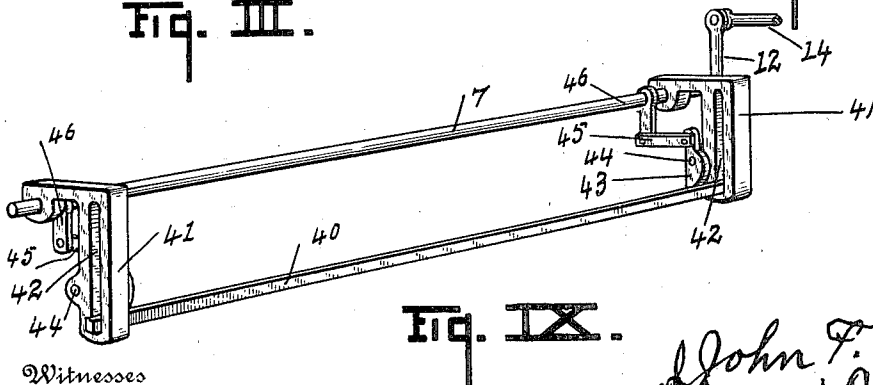
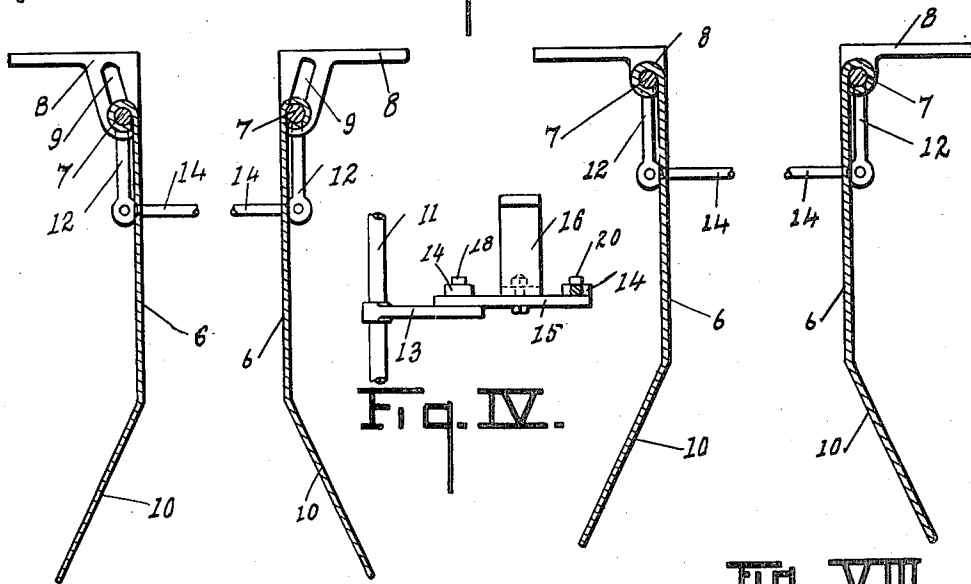
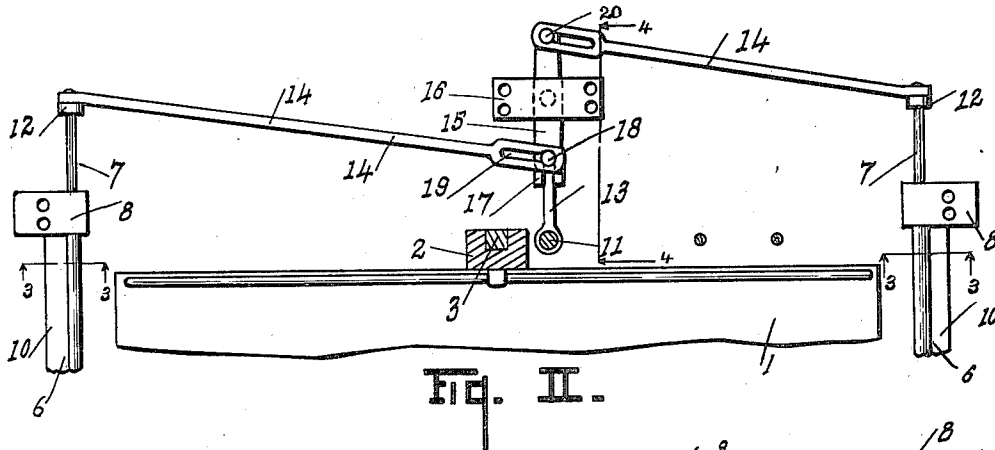
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 Chappell & Earl Attorneys

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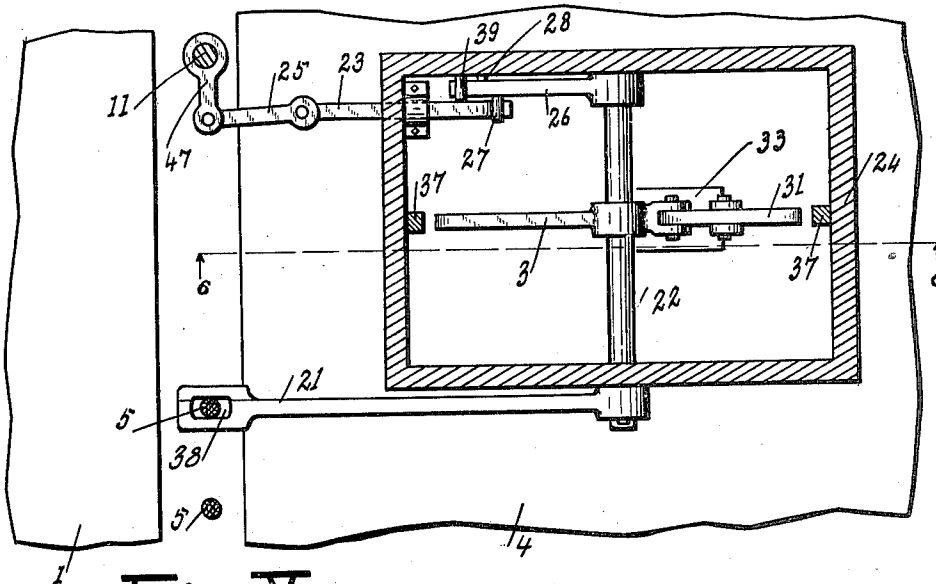


Fig. V.

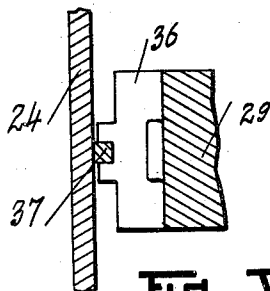


Fig. VII.

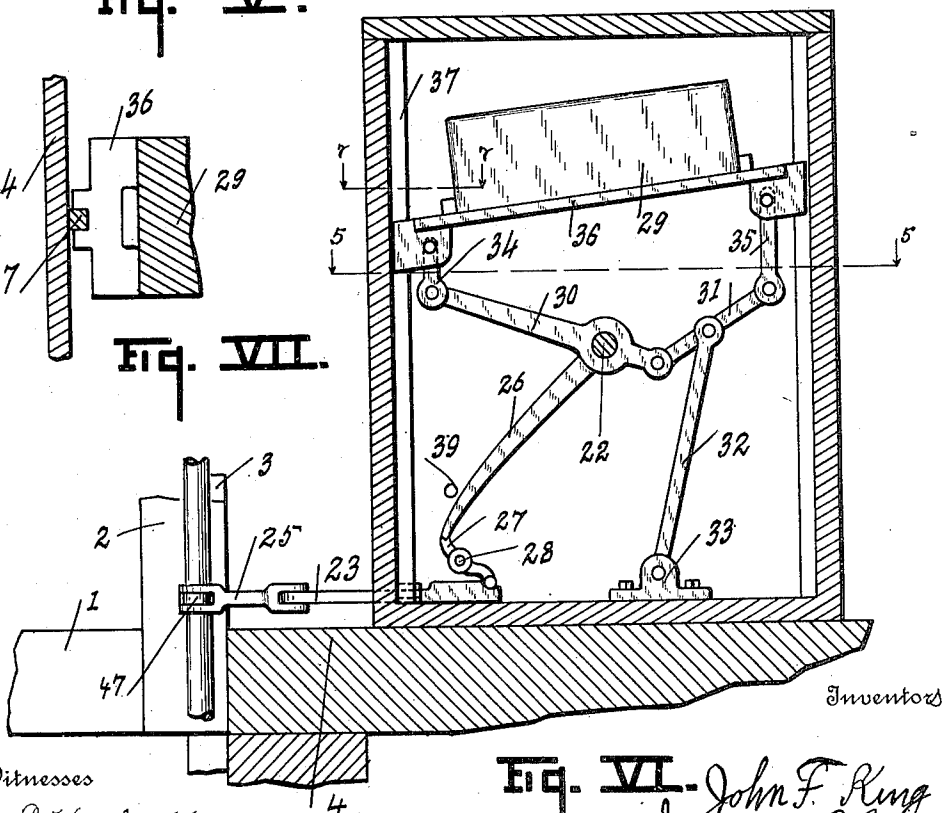


Fig. VI. John F. King
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Witnesses
 M. P. Woodruff
 L. G. Greenfield

UNITED STATES PATENT OFFICE.

JOHN F. KING AND JAMES P. NEARY, OF KALAMAZOO, MICHIGAN.

AUTOMATIC STOP OR SAFETY DEVICE FOR ELEVATORS.

1,090,918.

Specification of Letters Patent.

Patented Mar. 24, 1914.

Application filed March 22, 1913. Serial No. 756,152.

To all whom it may concern:

Be it known that we, JOHN F. KING and JAMES P. NEARY, citizens of the United States, residing at Kalamazoo, Michigan, have invented certain new and useful Improvements in Automatic Stops or Safety Devices for Elevators, of which the following is a specification.

This invention relates to improvements in automatic stops or safety devices for elevators.

The main objects of this invention are: First, to provide an improved automatic stop or safety device for elevators, which may be readily applied to elevators as commonly constructed, particularly factory or freight elevators which usually have open shafts or shafts open on one or more sides, as distinguished from walled shafts. Second, to provide an improved safety device or automatic stop for elevators which is very effective and at the same time one which is simple and economical in structure.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a detail perspective view of a structure embodying the features of our invention. Fig. II is a detail horizontal section of the actuating mechanism of our improved automatic stop or safety device in its preferred form as shown in Fig. I. Fig. III is a detail vertical section on a line corresponding to line 3—3 of Fig. II. Fig. IV is a detail vertical section on a line corresponding to line 4—4 of Fig. II. Fig. V is a detail horizontal section on a line corresponding to line 5—5 of Fig. VI, showing details of the control mechanism. Fig. VI is a detail vertical section on a line corresponding to line 6—6 of Fig. V. Fig. VII is a detail section on a line corresponding to line 7—7 of Fig. VI. Fig. VIII is a detail vertical section corresponding to that of Fig. III, of a modification of the actuating mechanism.

Fig. IX is a detail perspective view of a further modification of the actuating mechanism.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

In the accompanying drawing we have illustrated our improvements as embodied in an open shaft freight elevator. We have not shown the gates usually employed in such elevators as such gates form no part of this invention. Our improvements are desirable and readily adapted for embodiment in other types of elevators, particularly such as doorless passenger elevators.

The elevator deck or platform 1 of the structure illustrated, is provided with the usual slides 2 engaging the elevator ways 3. The floors 4 are provided with shaft openings through which the elevator travels as in common freight and factory elevator practice. The shaft is shown open on all sides for convenience in illustration.

5 represents the elevator control cable. Arranged below each floor or shaft opening at the edges of the opening are guard or actuating members 6. The actuating member rock shafts 7 are supported in hangers 8, the hangers being preferably provided with outwardly and upwardly inclined bearing slots 9 in which the rock shafts are disposed for pivotal and vertical movement. The apron-like guard or actuating members 6 illustrated as the preferred construction, have downwardly and outwardly inclined portions 10 at their lower edges.

When an object on the elevator projects beyond the edges of the elevator platform or deck sufficiently to engage the floor it will engage one of these actuating members, rocking its rock shaft or raising it or both, depending upon the manner in which the object engages the actuating member. For instance, if a board or the like carried by the elevator engages the front of one of the actuating members, it will merely swing the member, but should it project from the platform or deck far enough to engage the lower edge of the actuating member, the rock shaft may be raised in its bearing slots or both rocked and raised.

One of the rock shafts 7 is connected to the

common vertically disposed control shaft 11 by means of the arms 12 and 13 on the shafts 7 and 11 respectively, and the link 14. The link 14 of the other actuating member is connected to the arm 13 by means of the lever 15 pivotally mounted on the bracket 16 and slotted at 17 to engage the arm 13 on the shaft 11. Through this connection, when either of the actuating members is actuated, the rock shaft 11 is actuated in the same direction. The arms 13 are provided with laterally projecting pins 18 with which one of the links 14 of each actuating member engages and with which the lever 15 engages. The links 14 are slotted at 19 to engage the pin 18 on the arm 13 and the pin 20 on the lever 15. By this slotted connection, the actuation of any one of the guard or actuating members actuates the control shaft 11 without actuating the other control or actuating member.

The control mechanism illustrated consists of the control cable 5 passing through a slot 38 in the arm 21 on the rock shaft 22. The arm 47 on the control shaft 11 is connected by the link 25 to a trip slide 23 arranged within the casing 24. The rock shaft 22 is provided with a trip arm 26. This trip arm is normally held in set or operated position by means of the trip catch or dog 27 pivoted at 28 to be engaged by the trip slide 23. The trip weight 29 is carried by the toggle levers 30 and 31, the lever 30 being mounted on the shaft 22, while the lever 31 is pivotally supported by the link 32 pivoted on the bracket 33 in the bottom of the casing 24. The levers 30 and 31 are connected to the weight by means of the links 34 and 35 respectively, which are pivoted to the levers 40 and the weight carriage 36 which slidably engages the vertical ways 37 in the casing. When the arm 26 is released by the trip dog 27, the weight falls, thus actuating the rock shaft 22, and its arm 21, which is slotted at 45 to engage the control cable 5, and through it, controlling the elevator.

In order to start or release the elevator after it has been stopped by this automatic device, it is necessary to release the control member 6 through which the stop mechanism has been actuated and to raise and reset the trip weight. A stop pin 39 is provided for the arm 26 so that when the trip weight is raised to set the trip device, the arm swings to proper position to be engaged by the catch or locking dog 27.

We have shown our improved control trip mechanism as a self-contained mechanism, but we desire to state that it may be very greatly varied without departing from our invention.

In the modified construction shown in Fig. VIII, the slots 9 are omitted from the rock shaft supports. A structure in which the trip members are thus supported has

been found to be very satisfactory. The structure shown in Fig. II is, however, the form now preferred by us.

In the modification shown in Fig. IX, the actuating member is in the form of a bar 40 supported for vertical movement by the brackets 41 having the vertical slots 42 therein. The cam levers 43 are pivoted at 44 to be engaged by these actuating bars as the same are raised. The cam levers 43 are connected by the links 45 to arms 46 on the rock shafts 7, so that these rock shafts are actuated by the raising of the bars 40, thus actuating the control shaft and through it the control mechanism.

Our improved automatic stop or safety device is simple and economical in structure and is at the same time, very effective for the purpose, and may be readily adapted.

We contemplate various modifications other than those illustrated but do not illustrate or describe the same herein as we believe that from the disclosures herein made, those skilled in the art to which our invention relates will be able to adapt and embody the same as conditions may require.

We desire to be understood as claiming our improvements specifically in the form illustrated as well as broadly within the scope of the appended claims.

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

1. In an automatic stop device for elevators, the combination of a control shaft, apron-like guard and actuating members arranged below the elevator shaft opening at the edges thereof, the lower portions of said members being outwardly and downwardly inclined, rock shafts for said actuating members, supports having outwardly and upwardly inclined slot-like bearings for said rock shafts, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

2. In an automatic stop device for elevators, the combination of a control shaft, apron-like guard and actuating members arranged below the elevator shaft opening at the edges thereof, rock shafts for said actuating members, supports having outwardly and upwardly inclined slot-like bearings for said rock shafts, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

3. In an automatic stop device for elevators, the combination of a control shaft, apron-like guard and actuating members arranged below the elevator shaft opening at the edges thereof, the lower portions of said members being outwardly and downwardly inclined, rock shafts for said actuating members, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

4. In an automatic stop device for elevators, the combination of a control shaft, apron-like guard and actuating members arranged below the elevator shaft opening at the edges thereof, rock shafts for said actuating members, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

5. In an automatic stop device for elevators, the combination of a control shaft, actuating members supported below the elevator shaft opening at the edges thereof for vertical movement, rock shafts operatively associated with said actuating members, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

6. In an automatic stop device for elevators, the combination of a control member, an apron-like guard and actuating member arranged below the elevator shaft opening at the edges thereof, the lower portion of said member being outwardly and downwardly inclined, a rock shaft for said actuating member, supports having outwardly and upwardly inclined slot-like bearings for said rock shaft, and operating connections for said rock shaft to said control member.

7. In an automatic stop device for elevators, the combination of a control member, an actuating member arranged below the elevator shaft opening at the edges thereof, a rock shaft for said actuating member, supports having outwardly and upwardly inclined slot-like bearings for said rock shaft, and operating connections for said rock shaft to said control member.

8. In an automatic stop device for elevators, the combination of a control member, actuating members, rock shafts on which

said actuating members are mounted for pivotal and vertical movement, said members being supported to swing outwardly, and operating connections for said rock shafts to said control member whereby the control member is actuated by both the pivotal and the vertical movement of an actuating member.

9. In an automatic stop device for elevators, the combination of a control member, an actuating member, rock shafts on which said actuating members are mounted for pivotal and vertical movement, said members being supported to swing outwardly, and operating connections for said rock shaft to said control member whereby the control member is actuated by both the pivotal and vertical movement of said actuating member.

10. In an automatic stop device for elevators, the combination of a control shaft, actuating members arranged below the elevator shaft opening at the edges thereof, rock shafts for said actuating members supported for vertical and rotative movement, arms on said rock shafts, an arm on said control shaft, a pivoted lever having slotted engagement with said arm on said control shaft, and links connecting said arms on said rock shafts, one of the links having sliding engagement with said arm on said control shaft and the other having sliding engagement with said lever.

11. In an automatic stop for elevators, the combination of a control shaft, actuating members, rock shafts actuated thereby, arms on said rock shafts, a pivoted lever operatively associated with said arm on said rock shaft, and links connected to said arms on said rock shafts, one of the links having slotted engagement with said arm on said control shaft and the other having slotted engagement with said lever.

12. In an automatic stop for elevators, the combination of a control shaft, actuating members, rock shafts operatively associated with said actuating members, arms on said rock shafts, an arm on said control shaft, and operating connections for said arms on said rock shafts to said arm on said control shaft whereby the control shaft is actuated in the same direction by the actuation of either actuating member, said connections permitting the actuating of one actuating member without moving the other.

13. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism coacting therewith comprising a control trip, a vertical control shaft having operating connections with said control trip, guard or actuating members supported below each elevator shaft opening at the edges thereof, rock shafts operatively associated with said actuating members, arms on said rock shafts, 130

arms on said control shaft, and connections for said rock shafts and control shaft and control shaft arms whereby the control shaft is actuated in the same direction by the actuation of each actuating member and movement of the control shaft is not imparted to the actuating members.

14. In an automatic stop device for elevators, the combination of the elevator control mechanism comprising a vertical control shaft, guard or actuating members supported below each elevator shaft opening at the edges thereof, rock shafts operatively associated with said actuating members, arms on said rock shafts, arms on said control shaft, and connections for said rock shafts and control shaft and control shaft arms whereby the control shaft is actuated in the same direction by the actuation of each actuating member and movement of the control shaft is not imparted to the actuating members.

15. In an automatic stop device for elevators, the combination of a control mechanism, a vertical control shaft, guard or actuating members supported at each elevator shaft opening, rock shafts operatively associated with said actuating members, arms on said rock shafts, arms on said control shaft, and connections for said rock shafts and control shaft and control shaft arms whereby the control shaft is actuated in the same direction by the actuation of each actuating member and movement of the control shaft is not imparted to the actuating members.

16. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot through which said cable passes, a rock shaft by which said arm is carried, a trip weight, vertical guide ways for said trip weight, a lever on said rock shaft, one end of said lever being connected to said weight by a link, a second lever pivotally connected to the other end of said lever on said rock shaft and having a link connection to said weight at the other end, a supporting link for said second lever, a trip arm on said rock shaft, a catch for said trip arm, an actuating slide for said catch, a vertical control shaft connected to said slide, guard or actuating members supported at each elevator shaft opening, and operating connections for each of said members to said control shaft.

17. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot through which said cable passes, a rock shaft by which said arm is carried, a trip weight, vertical guide ways for said trip weight, a lever on said

rock shaft, one end of said lever being connected to said weight by a link, a second lever pivotally connected to the other end of said lever on said rock shaft and having a link connection to said weight at the other end, a supporting link for said second lever, a trip arm on said rock shaft, a catch for said trip arm, an actuating slide for said catch, and actuating members operatively connected to said slide.

18. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot and through which said cable passes, a rock shaft by which said arm is carried, a trip weight for acting on said rock shaft, a trip arm on said rock shaft, a catch for said trip arm, an actuating slide for said catch, a vertical control shaft connected to said slide, guard or actuating members supported at each elevator shaft opening, and operating connections for each of said members to said control shaft.

19. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot through which said cable passes, a rock shaft by which said arm is carried, a trip weight for acting on said rock shaft, a trip arm on said rock shaft, a catch for said trip arm, an actuating slide for said catch, and actuating members operatively connected to said slide.

20. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot through which said cable passes, a rock shaft by which said arm is carried, a trip weight for actuating said rock shaft, a catch for said rock shaft, a vertical control shaft, operating connections for said control shaft to said catch, guard or actuating members supported at each elevator shaft opening, and operating connections for each of said members to said control shaft.

21. In an automatic stop device for elevators, the combination of the elevator control cable, a control mechanism comprising an arm having a slot through which said cable passes, a rock shaft by which said arm is carried, a trip weight for actuating said rock shaft, a catch for said rock shaft, and actuating members operatively connected to said slide.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

JOHN F. KING. [L. S.]
JAMES P. NEARY. [L. S.]

Witnesses:

M. PHINA WOODRUFF,
PEARL E. LILLIE.