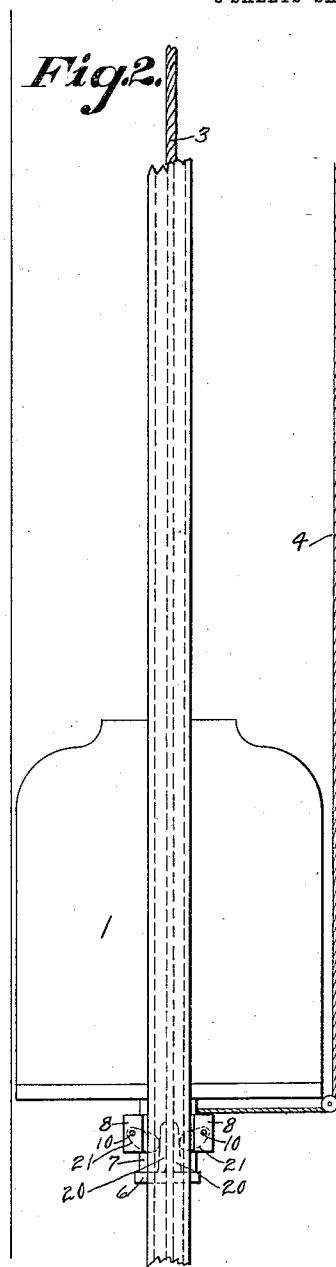
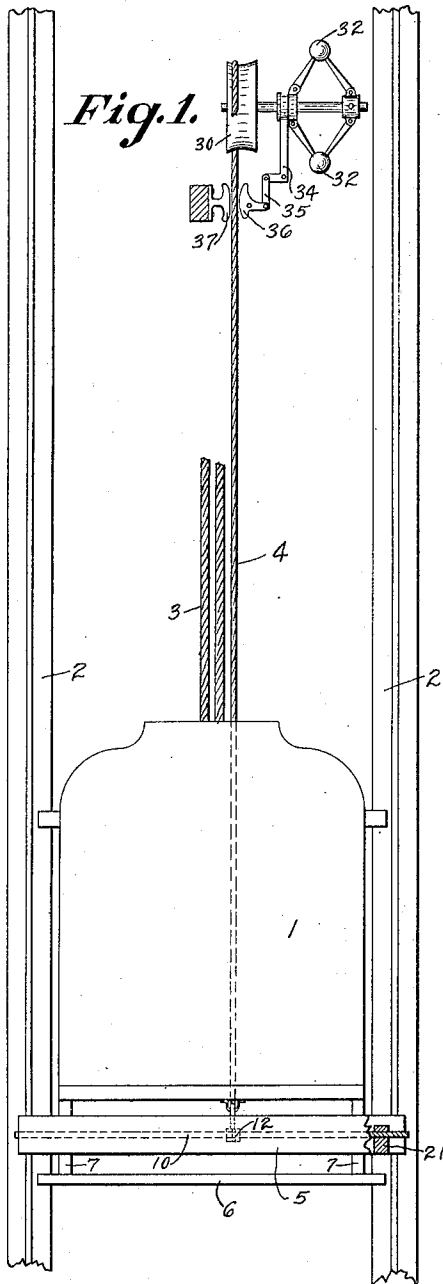


N. JOHANN.
ELEVATOR SAFETY DEVICE.
APPLICATION FILED MAY 16, 1912.

1,057,432.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 1.



Inventor

Witnesses
J. D. Bremer

Nick Johann
By *Erwin & Wheeler*

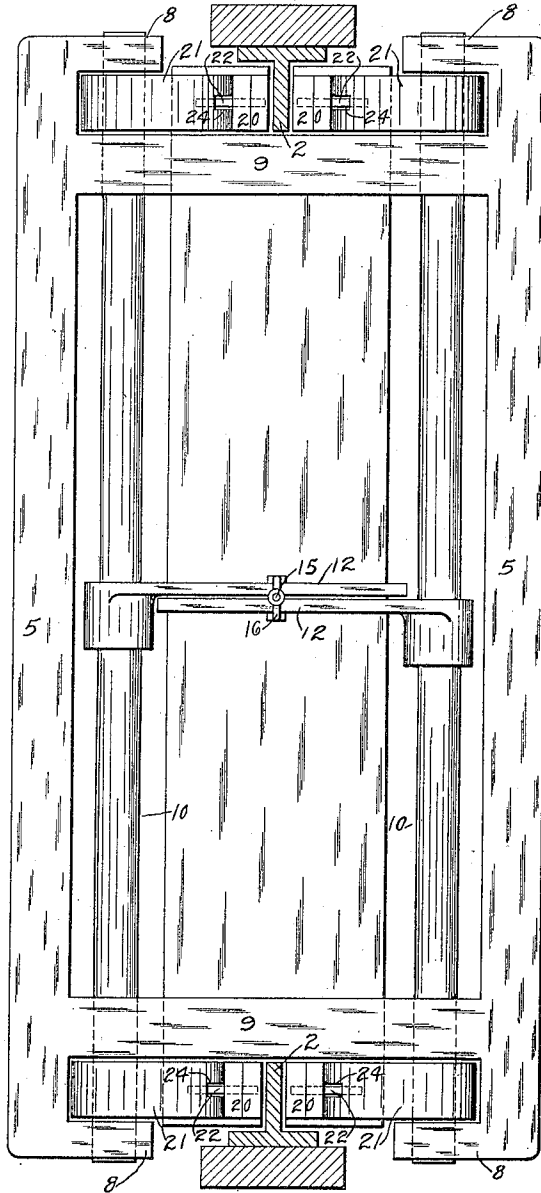
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Fig. 3.



Inventor

Witnesses
J. D. Bremer
J. D. Bremer

Nick Johann
By *Erwin F. Schuler*

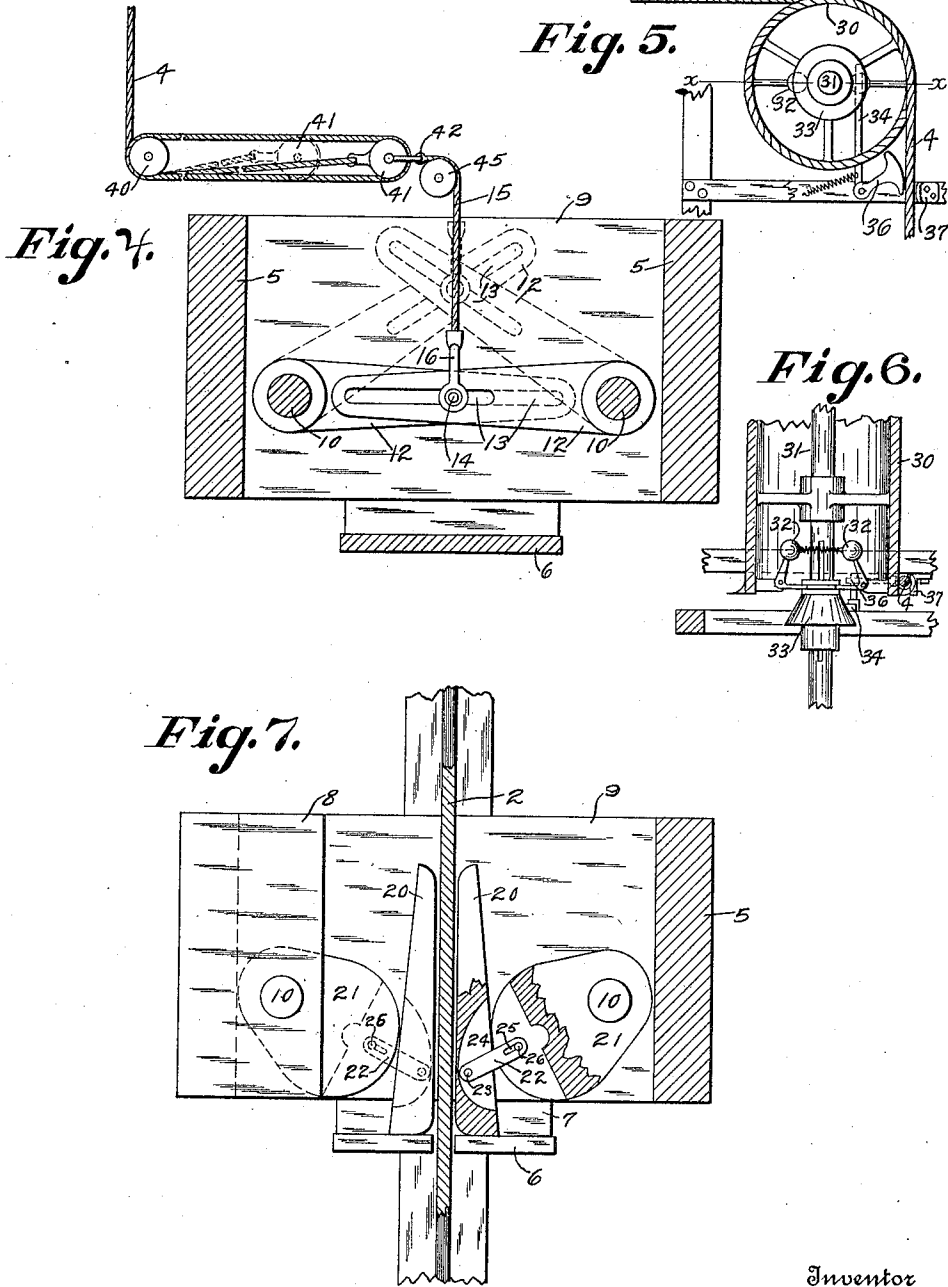
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Witnesses
J. D. Bremer
J. D. Bremer

Inventor
Nick Johann
334 *Erwin & Wheeler*
Attorneys

UNITED STATES PATENT OFFICE.

NICK JOHANN, OF MILWAUKEE, WISCONSIN.

ELEVATOR SAFETY DEVICE.

1,057,432.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed May 16, 1912. Serial No. 697,622.

To all whom it may concern:

Be it known that I, NICK JOHANN, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

My invention relates to improvements in elevator safety devices.

The object of my invention is to provide reliable means controlled by the speed of the elevator car, for locking said car to the supporting guide rails of the elevator well whenever the speed becomes excessive, as in case of an accident where the descent of the car is uncontrolled.

In the drawings—Figure 1 is a front elevation of an elevator car to which my invention is applied. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of that portion of my invention which is directly connected with the car underneath the floor thereof. Fig. 4 is a detail sectional view, showing a portion of the clutch actuating mechanism. Fig. 5 is a detail view of the governing mechanism controlling the operation of the clutch actuating mechanism. Fig. 6 is a horizontal sectional view of the parts shown in Fig. 5, drawn on line $x-x$ of Fig. 5, and Fig. 7 is a detail view, partly in section, of the clutches in operative relation to one of the guide rails.

Like parts are identified by the same reference characters throughout the several views.

1 is an elevator car and 2 are guide rails of ordinary type.

3 are operating cables for lifting and lowering the car, and 4 is a controlling cable, which forms a part of my improved safety device.

Underneath the car I have provided a frame, comprising side members 5, bottom members 6 and hangers 7, the latter serving to connect the frame with the floor of the car. The side members 5 extend laterally at each end beyond the walls of the car at the respective sides (front and rear) of the guide rails 2. These frame members 5 are intumed at their respective ends, as shown at 8 in Fig. 3, and they are also connected with each other by cross bars 9. Shafts 10, parallel with the members 5, are journaled in the cross bars 9 and in the intumed end portions 8, and these shafts are

provided with inwardly projecting arms 12, which lap upon each other and are slotted at 13 to receive a connecting bolt 14 to which a flexible operating connection 15 is secured by a link 16. The arrangement of the arms 12, bolt 14 and flexible connection 15 is such that by lifting upon the connection 15, the arms 12 may be raised to the position illustrated by dotted lines in Fig. 4. The arms 12 are rigidly connected with the shafts 10, whereby when the arms are raised, the shafts 10 will be rocked in their supporting bearings.

The bottom members 6 are adapted at each end to support a pair of clutch shoes 20, normally in close proximity to the inwardly projecting flange of the guide rail 2, but out of contact therewith. A cam 21, mounted upon each of the shafts 10, is loosely connected by a link 22 with one of the gripping shoes 20. The link is preferably pivoted at 23 in a link receiving socket 24 of the shoe and is provided at its other end with a slot 25, through which a pivot pin 26 passes, to connect it with the cam 21. The cam 21 is preferably recessed and link 22 extends into said recess, the walls of which prevent the link from swinging laterally on the supporting pivot pin 26.

In normal position, the cams 21 extend downwardly and inwardly from their respective shafts 10 in the direction of the clutch shoes 20, the rounded surfaces of the cams being in contact, or approximate contact, with the respective clutch shoes. But in case the arms 12 are lifted, as above explained, the cams will be correspondingly lifted, causing them to press upon the clutch shoes at a longer radius and forcing the clutch shoes inwardly against the intervening flange of the guide rail 2 with great pressure. As soon as the clutch shoes 20 are brought into contact with the guide rail flange, a continued downward movement of the car will of course cause a relative upward movement of the shoes 20, since the downward motion of such shoes will be arrested. The gripping action will then be no longer dependent upon the pull exerted upon the arms 12, but the weight of the car and its contents will become effective by pressing downwardly on the shafts 10 to oscillate the cams toward a horizontal position in rocker bearing contact with the now stationary clutch shoes 20. It therefore fol-

lows that the greater the load in the car, the greater the pressure that will be exerted upon the clutch.

To automatically actuate the levers 12, whereby the initial setting movement of the clutch shoes 20 is effected, I preferably employ a speed governor and provide connections for pulling upwardly on the flexible connection 15 in case the downward movement of the car becomes excessive. A convenient arrangement for utilizing a speed governor for this purpose is illustrated in Fig. 5, the cable 4 being arranged to wind upon or pass over a drum or pulley 30, the shaft 31 of which is provided with centrifugal governing weights 32, which actuate a sliding member 33 on shaft 31 and transmit motion through a lever 34 and link 35 to a brake shoe 36, said brake shoe being adapted to press the cable 4 against a stationary bearing member 37. Near the lower end of the cable 4, preferably below the floor of the car, the cable 4 is passed over pulleys 40 and 41, the latter being secured at 42 to the flexible connection 15, which runs over a pulley 45. The pulley 40 is a double pulley and the cable 4 passes around this pulley twice, as illustrated, this being a well understood tackle block mechanism. I prefer to employ the pulley and tackle connection for the reason that it allows a greater range of movement during the setting of the cams in clutching position and thus tends to avoid breaking the cable 4.

The specific form of governing mechanism is not essential to my invention. Any ordinary form of speed controlled governor may be employed to grip the cable 4 and set the brake 36, thus preventing the cable 4 from unwinding from drum 30, whereupon the downward movement of the car will cause a relative upward pull to be exerted through cable 4 and flexible connection 15 upon the arms 12. It will be observed that the cable 4 extends through the car 1. It is therefore possible for the operator in charge of the car to manually set the clutches by pulling upwardly on the cable 4 at any time such action may appear necessary. For example, assuming that the ordinary controlling mechanism of the car should fail to operate to stop the car at any stage of either an upward or downward movement, the operator could by pulling upwardly on the cable 4 set the clutches in gripping position. This will, however, be particularly effective during a downward movement of the car for the reason that whenever the clutches are set in gripping position, a downward movement of the car increases the binding action of the cams by reason of the downward movement of the cam supporting shafts after the clutches have engaged the guide rail.

With the above described construction, it

is obvious that after the car has been locked by the clutches engaging the guide rails, as above explained, it can be easily released after the proper repairs have been made by merely lifting the car, whereupon the clutch shoes will automatically release, since the upward movement of the car will be communicated to the cams through the pivot shafts, thus causing the cams to swing downwardly to normal position. The downwardly swinging movement of the cams will be communicated to the clutch shoes through the links 22 to retract the shoes from the guide rails.

I claim—

1. The combination with vertical guide rails, an elevator car and actuating mechanism therefor, of a frame connected with said car, a set of clutch shoes carried by said frame in position to grip the guide rails, cams pivotally connected with the frame and linked to the clutch shoes, and speed controlled means for actuating the cams, said cams being adapted to force said clutch shoes into contact with the guide rails.

2. The combination with an elevator car, and fixed supports along its line of movement, of frame members connected with said car and provided with shoe supporting members, a set of clutch shoes loosely mounted upon said frame members and adapted to engage the fixed supports at the sides of the car, a set of frame supported pivoted cams loosely connected with said clutch shoes and adapted when oscillated, to move said shoes into gripping relation with the fixed supports, the gripping portions of said clutch shoes being directly interposed between the cams and the fixed supports, said cams being located in the line of gripping pressure upon said supports, normally free running connections operatively connected with said cams, and means for actuating said connections when the downward speed of the car becomes excessive.

3. The combination with an elevator car and its guide rail, of a frame secured to the car, a set of shafts mounted in said frame at opposite sides of the guide rail, a set of loose clutch shoes, one movably mounted in said frame between each of the shafts and said guide rail, a cam rigidly mounted on each shaft with the clutch shoe interposed between it and the guide rail, and speed controlled means for actuating the cams, said cams being adapted, when actuated, to force the clutch shoes into engagement with the respective sides of the guide rail, and the distance between the shafts and guide rail being insufficient to allow the cams to swing past the horizontal plane of said shafts.

4. The combination with an elevator car and its guide rail, of a frame secured to

the car, a set of shafts mounted in said frame at opposite sides of the guide rail, a set of clutch shoes, one movably mounted in said frame between each of the shafts and said guide rail, a cam rigidly mounted on each shaft in operative relation to the corresponding clutch shoe, and speed controlled means for actuating the cams, said cams being adapted, when actuated, to force the clutch shoes into engagement with the respective sides of the guide rail, together with links loosely connecting the cams with the clutch shoes.

5. The combination with an elevator car and its guide rail, of a frame secured to the car, a set of shafts mounted in said frame at opposite sides of the guide rail, a set of clutch shoes, one movably mounted in said frame between each of the shafts and said guide rail, a cam rigidly mounted on each shaft in operative relation to the corresponding clutch shoe, and speed controlled means for actuating the cams, said cams being adapted, when actuated, to force the clutch shoes into engagement with the respective sides of the guide rail, together with links loosely connecting the cams with the clutch shoes, said clutch shoes and cams being recessed for the reception of said links.

6. The combination with an elevator car, of a set of guide rails at the respective sides of the car, a set of clutch shoes for each guide rail carried by the car and arranged to grip the guide rail between them, a set of oscillatory cams pivotally connected with

the car and adapted to engage the clutch shoes and guide rail between them, and means controlled by the speed of the car for actuating the cams.

7. The combination with an elevator car, of a set of guide rails at the respective sides of the car, a set of clutch shoes for each guide rail carried by the car and arranged to grip the guide rail between them, a set of oscillatory cams pivotally connected with the car and adapted to engage the clutch shoes and guide rail between them, and means controlled by the speed of the car for actuating the cams, said actuating means comprising a set of cam actuating arms, a winding drum, a flexible connection extending from the actuating arms over said drum, a speed governor connected with the drum, and a brake operated by the speed governor and adapted to control the unwinding movement of said flexible connection.

8. The combination with an elevator car, of a set of stationary guide rails at the respective sides of the car, a set of clutch shoes for each guide rail carried by the car and arranged to grip the guide between them, a set of oscillatory cams pivotally connected with the car and adapted to engage the clutch shoes and guide rail between them, and connections for actuating said cams.

In testimony whereof I affix my signature in the presence of two witnesses.

NICK JOHANN.

Witnesses:

GEO. JOHANN,

FRED JAEGER.