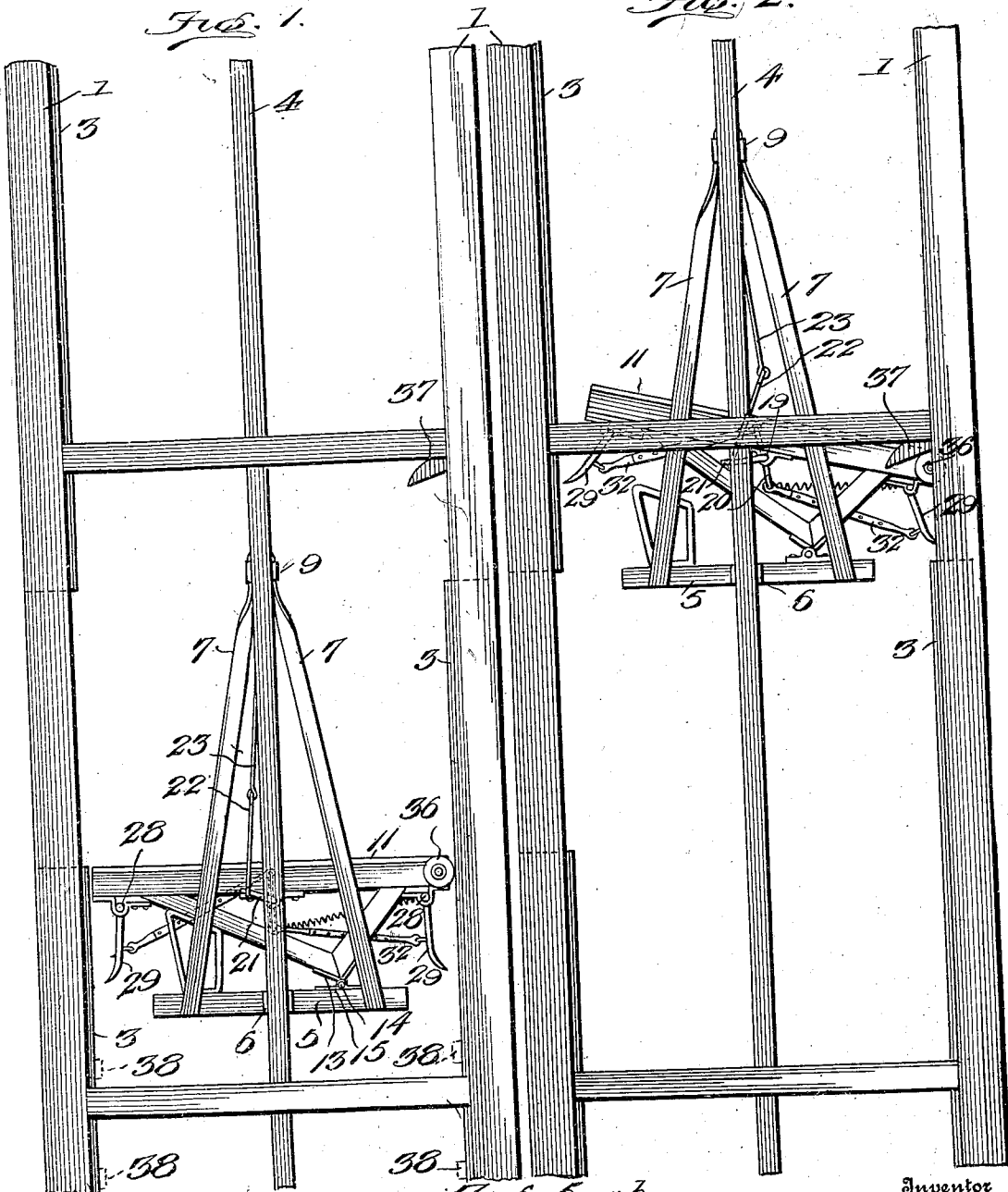


No. 870,411.

PATENTED NOV. 5, 1907.

J. L. BOREN.
SAFETY APPLIANCE FOR ELEVATORS.
APPLICATION FILED APR. 2, 1907.

2 SHEETS—SHEET 1.



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Fig. 5
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Fig. 3.

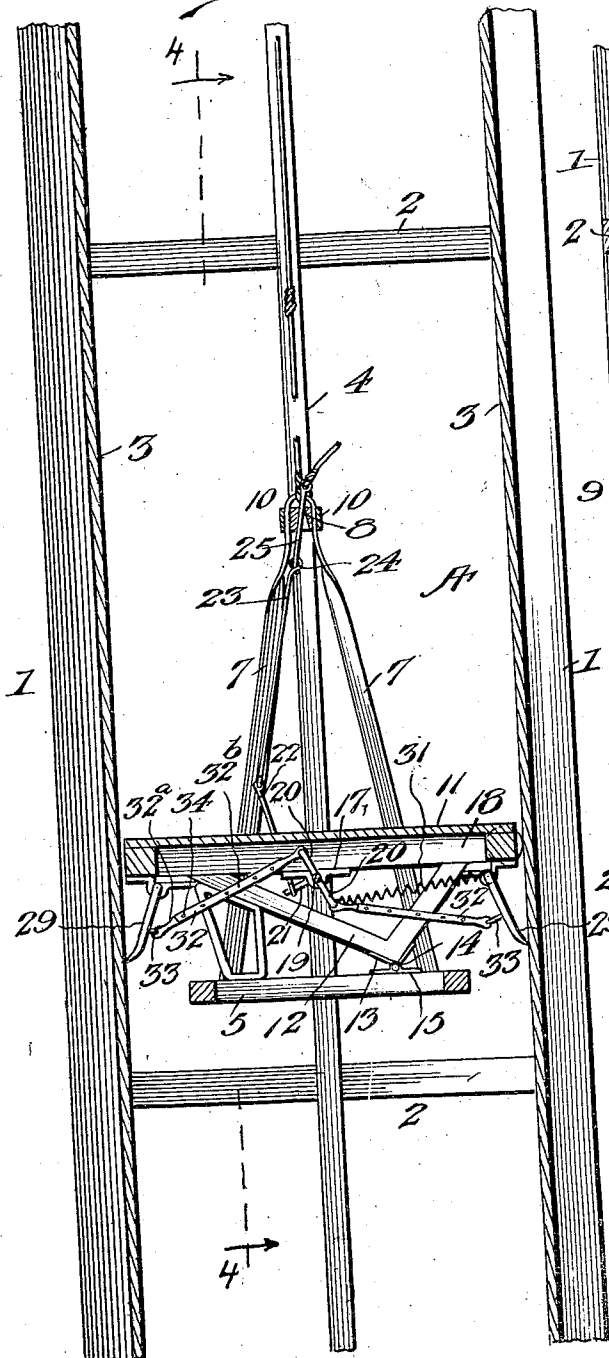
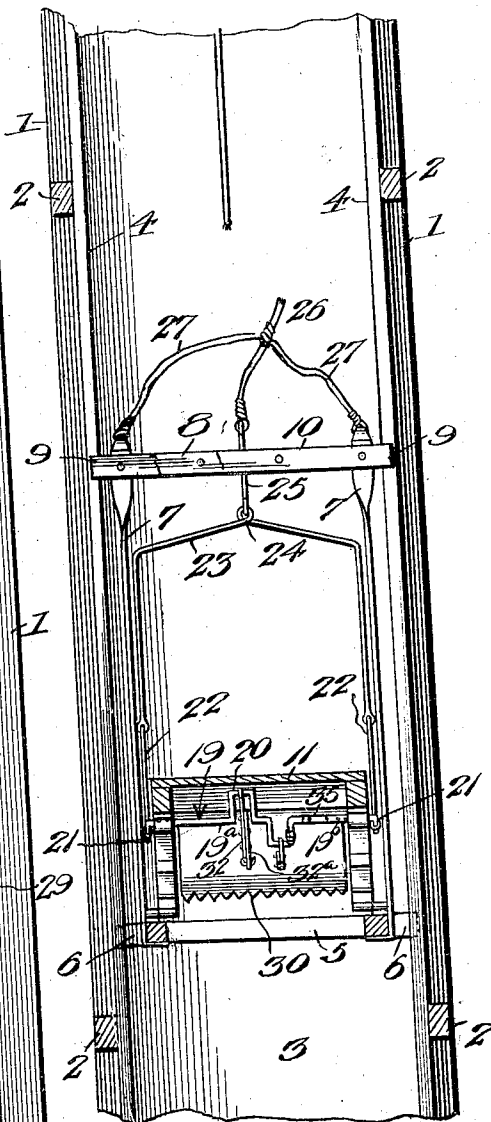


Fig. 4.



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SAFETY APPLIANCE FOR ELEVATORS.

No. 870,411.

Specification of Letters Patent.

Patented Nov. 5, 1907.

Application filed April 2, 1907. Serial No. 365,989.

To all whom it may concern:

Be it known that I, JAMES L. BOREN, a citizen of the United States, residing at Carterville, in the county of Williamson and State of Illinois, have invented new and useful Improvements in Safety Appliances for Elevators, of which the following is a specification.

This invention relates to safety appliances for elevators; and it has for its object to provide a simple and efficient device whereby, in the event of breakage, of the hoisting rope or element, the descent of the elevator car or cage will be positively checked or arrested, thus reducing or obviating the danger of injury to occupants of the cage and to any persons who may be stationed in the shaft of the elevator beneath the cage.

Further objects of the invention are to simplify and improve the construction and operation of this class of devices.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

The invention is applicable to any of the various forms of elevators for conveying passengers, merchandise or bulk material in which a cage or car is arranged to travel in a vertical shaft; the latter being usually provided with rails or uprights for guiding the car; and in the drawings the invention has been shown applied to an ordinary mine elevator, the cage of which is provided with a tilting platform.

In said drawings, Figure 1 is a side elevation showing the cage or car near the upper landing of an elevator shaft; the casing of the shaft having been removed on the near side. Fig. 2 is a similar view showing the car at the upper landing with the tilting platform in dumping or discharging position. Fig. 3 is a vertical sectional view showing the car or cage at an intermediate position in the shaft with the safety appliance in operation. Fig. 4 is a transverse sectional view taken on the plane indicated by the line 4—4 in Fig. 3. Fig. 5 is a detail view of one of the connecting links.

Corresponding parts in the several figures are denoted by like characters of reference.

The elevator shaft A includes the corner posts or uprights 1—1 which are connected at intervals by cross-bars or braces 2—2 supporting the walls of the casing 3. Vertically disposed guide rails 4—4 are disposed at the sides of the shaft intermediate the corner posts.

The car or cage includes a bottom frame 5, the sides of which are provided with clips 6 engaging the guide rails 4, said frame being supported by yokes 7, one at each side thereof, and said yokes being connected at their upper ends to a cross-bar 8 having terminal clips 9 guided upon the rails 4; said clips, as shown in the drawings, may be formed by straps or bars 10 secured upon the sides of the cross-bar 8, to strengthen and reinforce the latter.

11 is a tilting platform which is provided upon its underside with angular or V-shaped brackets 12, the apices of which are disposed between the longitudinal center of the platform and the dumping or discharge side of the latter; this being readily accomplished by making the limbs of the V-shaped brackets of unequal length, as will be clearly seen in the drawings; the apices of the brackets are provided with hinge members 13 connected by pins or bolts 14 with boxings 15 upon the frame 5, and the latter is provided with supporting members 16 whereby the tilting platform 11 is supported normally in an approximately horizontal position.

Supported in boxes or bearings 17 upon the undersides of the side sills 18 of the tilting platform is a transversely disposed rock shaft 19 provided intermediate its ends with oppositely extending cranks 20, and having terminal radially extending arms 21 both of which extend in the same direction at a suitable angle, approximating ninety degrees, to the intermediate cranks 20. Said radial arms are connected by links 22 with the lower ends of the arms or side members of a yoke or bail 23, the cross-bar of which is provided with a centrally disposed eye 24 which is connected by a link 25 with the flexible element 26 which constitutes the hoisting element whereby the car is suspended, and which is provided with divergent branches 27 connected with the upper ends of the suspending yokes 7, the arrangement being such that when the flexible suspending element is intact, the rock shaft will be sustained with its oppositely extending cranks 20 disposed in an approximately vertical plane.

Supported in boxes upon the undersides of the sills of the tilting platform 11, adjacent to the ends of the latter, are shafts 28 carrying aprons 29 consisting of solid plates of steel, the lower edges of which are curved outward in the direction of the end walls of the shaft casing, and provided with teeth or serrations 30, as clearly seen in Fig. 4. One of the cranks 20 of the rock shaft 19 is connected with a fixed point upon the underside of the platform 11, for instance, with one of the shafts 28, by a stout spring 31, the tension of which will be exerted to oscillate said rock shaft. The cranks 20 are connected with the aprons 29 by means of links 32 engaging eyes 33 upon the insides of said aprons.

Each of the links 32 is preferably composed of two overlapping members 32^a and 32^b suitably connected

by bolts or fastening members 34 engaging apertures 34^b in said overlapping members, which latter will thus be adjustably connected so that they may be lengthened or shortened to suit varying conditions; in like manner the rock shaft 19 is preferably composed of two overlapping members 19^a and 19^b adjustably connected by bolts 35 in order that the rock shaft may be adjusted upon tilting platforms of different widths.

The tilting platform is provided adjacent to its discharge end, with an engaging member, such as a roller 36 adapted to be engaged by a lug or cam 37 connected with the elevator casing adjacent to the top landing where the load is to be discharged, for the purpose of tilting the platform as will be seen in Fig. 2 of the drawings.

The operation of this invention will be readily understood from the foregoing description taken in connection with the drawings. Under normal conditions, when the weight of the car is sustained by the hoisting element, the upward stress of the latter upon the yoke or bail 23 maintains the rock shaft 19 with its oppositely extending cranks 20 in an approximately vertical plane against the tension of the spring 31, the free edges of the aprons 29 being thus held out of engagement with the end walls of the shaft casing. If the cage or car should suddenly descend, owing to breakage or to a sudden accidental slackening of the hoisting element, the rock shaft 19 will be oscillated under the tension of the spring 31, and the aprons 29 will be forced in an outward direction by the links 32, causing their serrated edges to firmly engage and bite in the walls of the casing, thus positively checking the downward movement of the car, and holding the latter securely without danger to the occupants. A similar oscillation of the rock shaft 19 will occur when the platform 11 is tilted by engagement of the roller 36 with the cam 37 at the top landing where the load is to be discharged; the free edges of the aprons 29 being thus swung in an outward direction; at this point, however, owing to the tilted condition of the platform, the apron at the rear end of the latter will remain clear of the wall of the shaft casing, while the apron at the front end of the platform will overhang the upper edge of the wall 3 and form a guard whereby lumps of coal or other material that is being discharged from the platform will be prevented from dropping within the shaft casing; as soon as, by lowering the car or cage, the tilting platform is restored to its normal horizontal position, the aprons 29 will automatically re-assume their normal positions, clear of the walls of the shaft casing.

Safety appliances to prevent the accidental descent of elevator cars or cages are usually constructed to en-

gage the guide rails, and the latter, being oftentimes frail or imperfectly secured, are liable to give way under the sudden strain to which they are thus exposed, thus rendering the safety appliance useless and frustrating the object for which it is provided. By the present invention the entire width of the shaft casing is engaged by the safety aprons, and failure of the latter to act and to prevent the car or cage from dropping is practically impossible. Even if one of the aprons should fail to act, the other one will be sufficient to check the descent of the car; and even if the elevator casing should become ripped and torn, the torn portions will be thrown inward beneath the car platform, and stop the descent.

In cases where the walls of the shaft casing are made of sheet iron, it may be found necessary to provide them at intervals with cross-bars, as shown in dotted lines in Fig. 1 of the drawings, at 38, and such cross-bars will then be effectively engaged by the safety aprons in the event of accident.

Having thus fully described the invention, what I claim as new is:—

1. In a device of the class described, an elevator shaft including a casing, a hoisting element, a car or cage including a bottom frame connected with and supported by the hoisting element and a tilting platform supported upon the bottom frame, a rock shaft mounted for oscillation upon the tilting platform and having oppositely extending cranks and terminal radial arms, aprons hingedly connected with the platform, links connecting the aprons with the cranks of the rock shaft, a spring disposed to force the free edges of the aprons in the direction of the walls of the casing, a yoke or bail connected with the hoisting element, links connecting the side members of said yoke with the terminal arms of the rock shaft, an engaging member upon the tilting platform, and a cam member connected with the shaft structure in the path of said engaging member.

2. In a device of the class described, the combination with an elevator car or cage of a hingedly supported apron of a width approximately equal to that of the car or cage, and means for projecting the free edge of said apron in an outward direction.

3. In a device of the class described, an elevator car or cage including a bottom frame, a hoisting element connected with and supporting said frame, and a tilting platform supported upon the bottom frame, aprons supported hingedly upon the tilting platform, adjacent to the front and rear ends of the latter, and means for projecting the free edges of said aprons outwardly, said means including a rock shaft supported in bearings upon the tilting platform and having oppositely extending cranks, and links connecting said cranks with the aprons.

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

JAMES L. BOREN.

Witnesses:

A. J. GUERRETTAZ,
A. K. ELLER.