No. 849,188. PATENTED APR. 2, 1907.

A. BENNETT & R. BINDER.

SAFETY ELEVATOR.

APPLICATION FILED SEPT. 9, 1905.

Fig. 1.

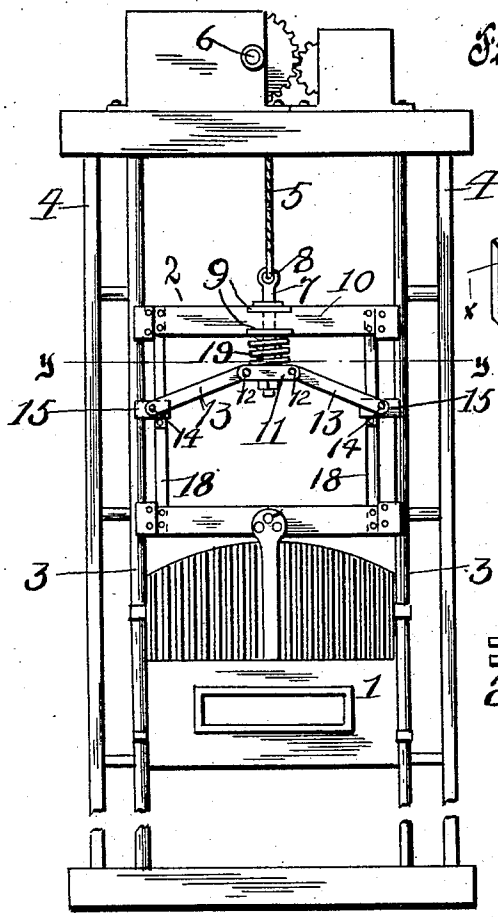
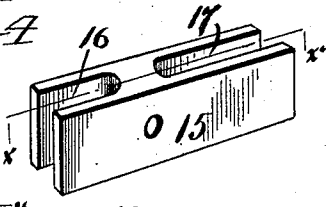


Fig. 4



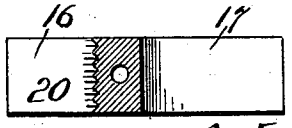


Fig. 5

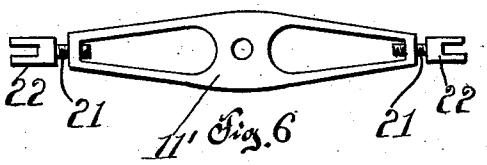


Fig. 6

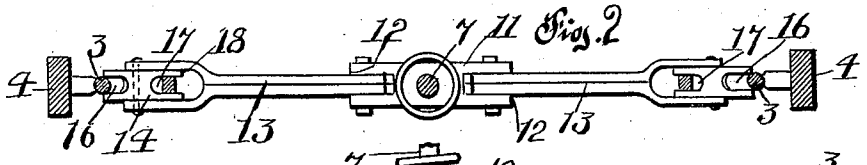


Fig. 2

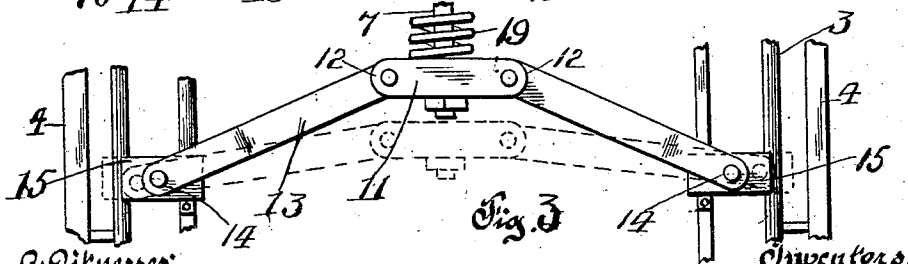


Fig. 3

Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT BENNETT, OF ARNOLD, AND RUDOLPH BINDER, OF NATRONA, PENNSYLVANIA.

SAFETY-ELEVATOR.

No. 849,188. Specification of Letters Patent. Patented April 2, 1907.

Application filed September 9, 1905. Serial No. 277,799.

To all whom it may concern:

Be it known that we, ALBERT BENNETT, residing at Arnold, in the county of Westmoreland, and RUDOLPH BINDER, residing at Natrona, in the county of Allegheny, and State of Pennsylvania, citizens of the United States of America, have invented certain new and useful Improvements in Safety-Elevators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in safety devices for elevators.

The invention is especially designed for use in connection with elevators operating in mine-shafts wherein the accidents due to the breaking of the rope are frequent; but the device is equally applicable to other forms of elevators and like structures.

A particular type to which this invention pertains relates to means for automatically throwing the safety clutch or pawl into engagement with the guideways of the elevator-shaft in event of the breaking of the rope extending from the winding-drum.

More particularly, the invention comprises a frame upon which a safety device is mounted and carrying positively-disposed pawls adapted to engage the stationary elevator-guideways. A spring is carried by the frame and is adapted to give the pawls their first or gripping position with relation to the stationary guideways, the weight of the cage being sufficient to maintain the pawls in their operative position and cause them to tightly and positively engage the stationary guideways by frictional contact.

The detailed construction will appear in the course of the following description, and in the drawings forming a part of this application like reference characters are employed to designate corresponding parts throughout the several views, and in the drawings thus employed, Figure 1 is a front elevation showing the device in its operative position prior to the breaking of the elevator-rope. Fig. 2 is a sectional view on the line *y y* of Fig. 1 looking downwardly, the cage being omitted. Fig. 3 is a side elevation of a portion of the device, showing the connection between the shoes and the elevator-cage. Fig. 4 is a perspective view of one of the shoes. Fig. 5 is a vertical sectional view of one of the shoes, taken on the line *x x* of Fig. 4. Fig. 6 is a top plan view of the turnbuckle employed for uniting the frictional gripping-pawls of the safety device.

Referring now particularly to the accompanying drawings, the elevator-cage 1 is suspended from a rectangular frame 2, which slides in the stationary guideways 3 at each side thereof, mounted in the framework 4 of a mining-shaft. The frame 2 is suspended from the elevator-rope 5, which has connection with the winding mechanism 6.

The connection between the cage and the rope is not made directly, but is made through the parts of an intermediate safety device.

The safety device embodies a vertical rod 7, terminating at its upper end in an eye 8, by which it is secured to the rope 5. Said rod 7 extends through bearings 9, mounted in the top of the cross-bar 10 of the frame. These bearings 9 are rigidly secured to said cross-bar and extend laterally beyond the sides of the cross-bar, being formed with alined openings through which said rod 7 passes. Mounted upon the lower end of the rod 7 is a link 11, which is recessed on each side to provide bearings 12, in which are fulcrumed yoke-shaped toggle-links 13, having pivotal connection at their bifurcated ends 14 with shoes 15, said shoes being provided on opposite sides with recesses 16 17. The recesses 16 serve to engage or to fit over the guideways 3, while the recesses 17 fit over the side bars 18 of the slidable frame 2. A spring 19 is interposed between the lowermost bearing 9 and the link 11. It is to be noted that the shoes 15 have their recesses 16, which fit over the stationary guideways, provided with gripping-teeth 20.

In Fig. 6 is shown a modified form of connecting-link, as at 11′, which is designed to effect an adjustment between the toggle-links 13 and the stationary guides 3. The link 11′ follows out the general construction of a turnbuckle and has secured to each end thereof threaded connecting-bolts 21, to the heads of which are swiveled U-shaped bearings 22, in which said toggle-links are pivoted.

It is obvious that the shoes 15 may be varied from the form shown in the drawings to adapt them to the various types of stationary guideways employed. The stationary guide-

ways are those commonly employed in mine-shafts.

In operation it is assumed that the elevator-cage is moving in either direction and that the tension of the rope 5, pulling upon the rod 7 and the safety device connected thereto, will serve to draw the safety device into the position illustrated in full lines in Fig. 3, wherein the shoes 15 merely slide upon the stationary guides 3, but are not in positive engagement therewith. Should the rope break, the spring 19 depresses the link 11, straightening the toggle-links 13, thereby causing the shoes 15 to assume the position shown in dotted lines in Fig. 3 upon the guides 3. As soon as the shoes 15 assume the position shown by dotted lines in Fig. 3 the weight of the cage suspended from the slidable frame 2 will serve to impart a downward movement to said frame 2, which will act directly upon the link 11 and the toggle-links 13 to spread them apart and to cause the shoes 15, with the serrated outer faces 20, to contact and firmly and positively grip the stationary guides 3, thereby instantly stopping the cage in its movement. It is to be noted that the spring 19, in addition to the function above described of giving the shoes their first contact with the stationary guides 3, serves a second function by acting as a cushioning device for the shock occasioned by the weight of the cage as it drops downward in the slidable frame 2 to spread the toggle-links apart and cause the operation of the shoes.

What we claim is—

1. In a device of the character described, spaced stationary guideways, a frame slidable on said guideways, a cage suspended from said frame and provided with bearings engaging said stationary guideways, a vertical rod carried by said frame and slidable therein, toggle members carried by said vertical rod, shoes having bifurcated ends for engaging said stationary guideways and connected to said toggle members and movably engaging said frame, and a spring associated with said vertical rod and adapted to operate said toggle members to cause said shoes to bind on said stationary guideways.

2. In a device of the class described, spaced stationary guideways, a frame slidable upon said stationary guideways, a cage suspended from said frame and provided with bearings movably engaging said stationary guideways, a vertical rod carried by said frame and having its upper extremity connected to the elevator-cable, bearings formed in said frame and with said rod adapted to slide in said bearings, toggle-levers carried by the lower extremity of said rod, guideways carried by said slidable frame, shoes carried by said toggle-levers and movable laterally on the slidable frame and adapted to engage the guideways of the same, and a coil-spring surrounding said vertical rod, said coil-spring adapted to operate said toggle-levers thereby causing said shoes to bind on said stationary guideways.

In testimony whereof we affix our signatures in the presence of two witnesses.

ALBERT BENNETT.
RUDOLPH BINDER.

Witnesses:
E. H. THOMPSON,
F. N. FILMLEY.