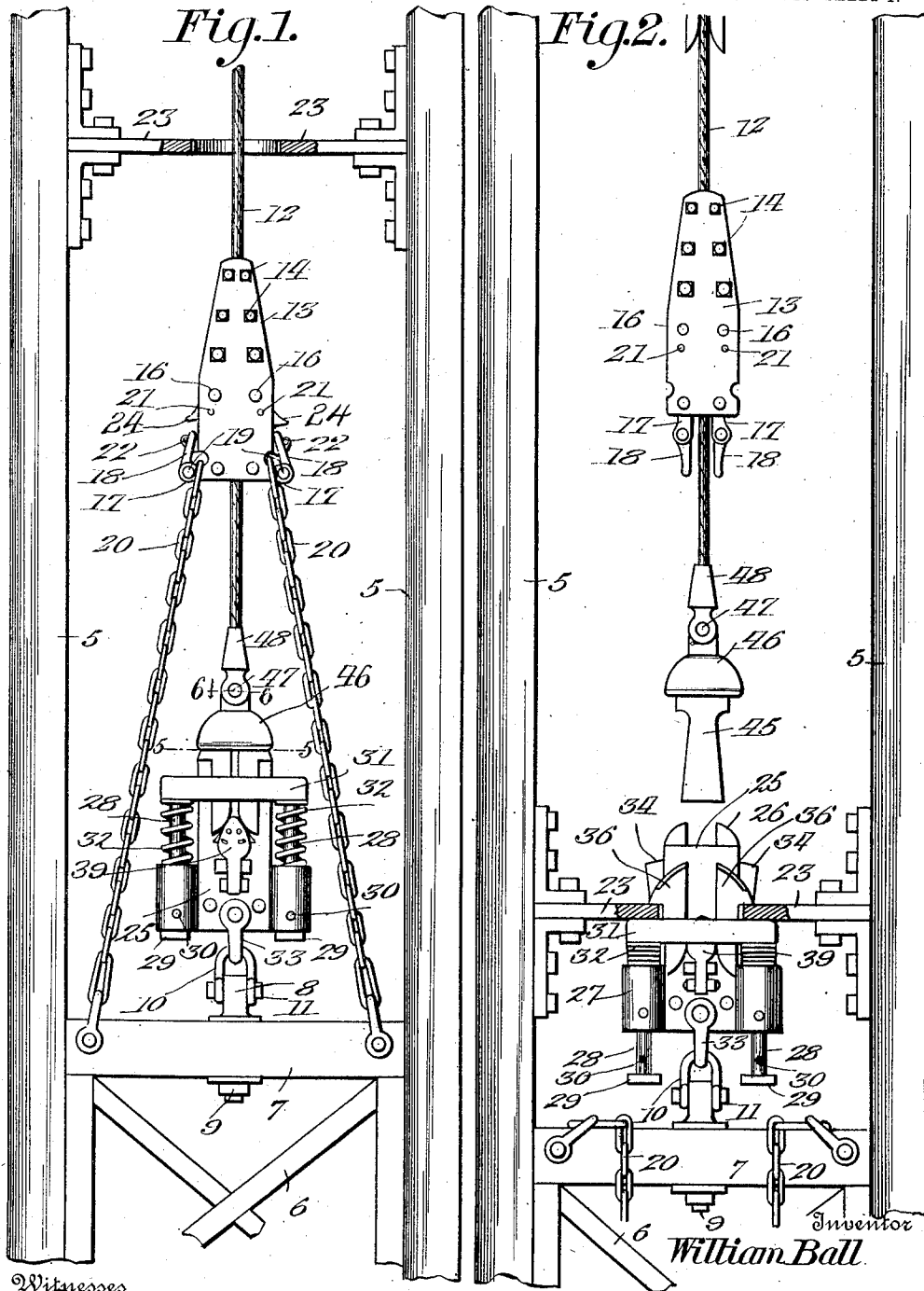


W. BALL.
CABLE RELEASING DEVICE.
APPLICATION FILED MAR. 22, 1911.

1,016,386.

Patented Feb. 6, 1912.

3 SHEETS—SHEET 1.



Witnesses

Phil E. Barus
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By *Victor J. Evans*
Attorney

1,016,386.

Patented Feb. 6, 1912.

3 SHEETS—SHEET 2.

Fig. 3.

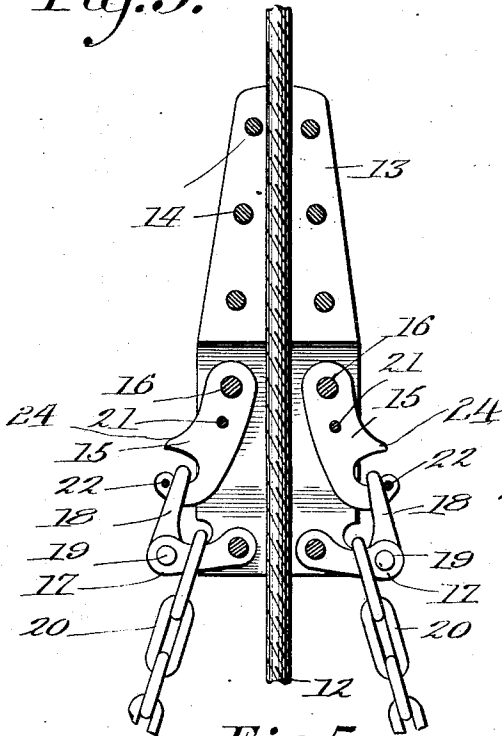


Fig. 4.

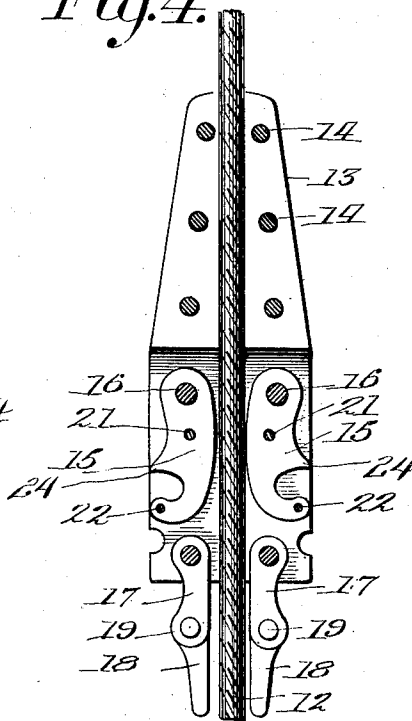


Fig. 5.

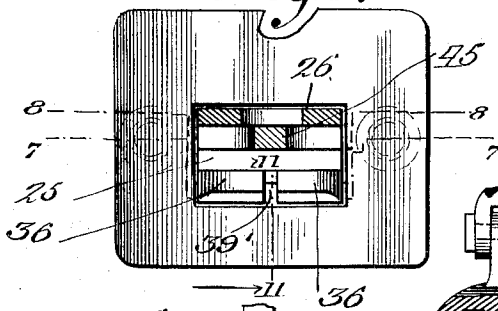


Fig. 6.

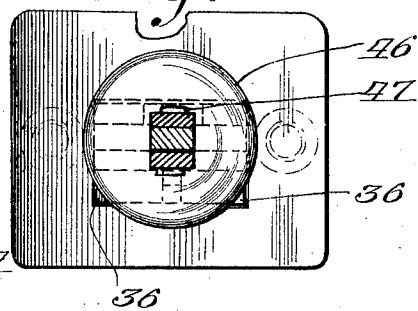


Fig. 11.

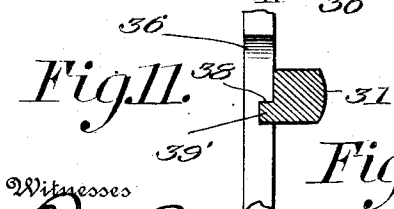
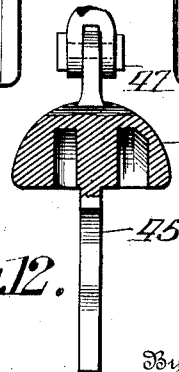


Fig. 12.



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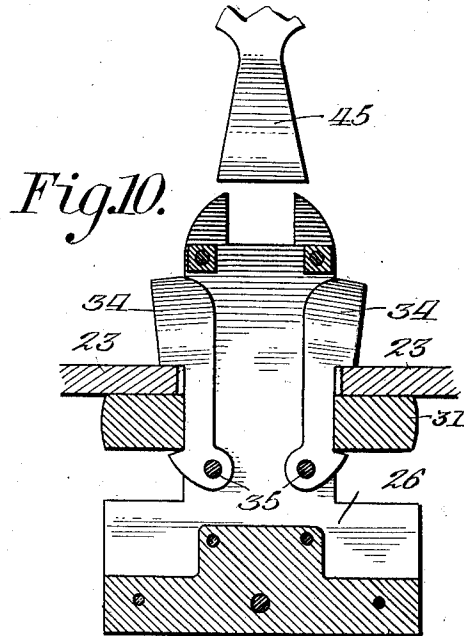
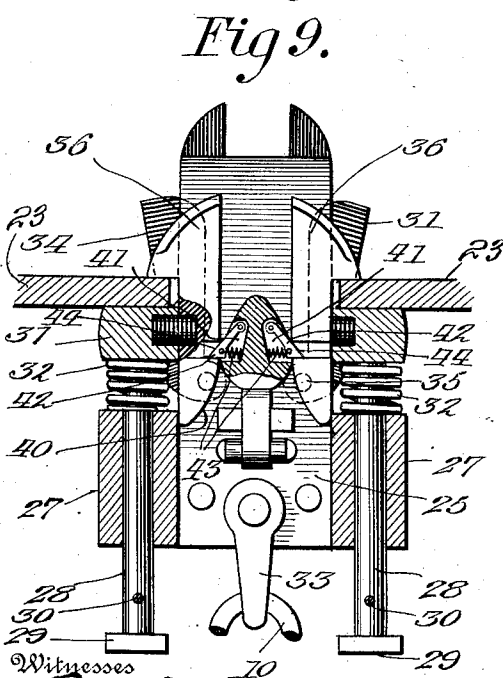
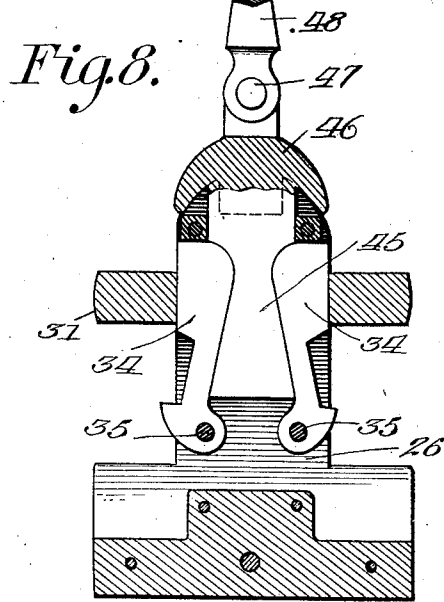
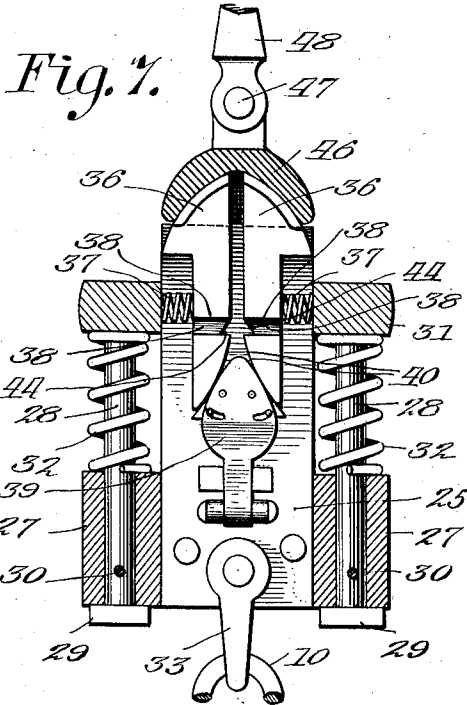
Witnesses
Edw. E. Barnes
J. O. Vandewer

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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM BALL, OF WILKES-BARRE, PENNSYLVANIA.

CABLE-RELEASING DEVICE.

1,016,386.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed March 22, 1911. Serial No. 616,147.

To all whom it may concern:

Be it known that I, WILLIAM BALL, a subject of the King of Great Britain, residing at Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented new and useful Improvements in Cable-Releasing Devices, of which the following is a specification.

The invention relates to safety devices for lifts, and more particularly to the class of cable releasing devices.

The primary object of the invention is the provision of a device of this character in which the lift or elevator cage will be locked at the head of the shaft and simultaneously its lifting cable released, should the raising and lowering mechanism of the lift or cage continue in operation after the said lift or cage has arrived at the top of the elevator shaft, thereby obviating injury to the lift or cage, or the raising and lowering mechanism therefor.

Another object of the invention is the provision of a releasing device of this character in which the lift or cage within an elevator shaft may be anchored when arriving at the top of the said shaft, and the hoisting cable thereof automatically released, should the raising and lowering mechanism continue in operation. Thus in this manner, injury to the passengers or the load upon the cage or lift will be obviated, and at the same time there will be no possibility of the lift or cage dropping from its elevated position within the shaft.

A further object of the invention is the provision of a device of this character in which the lift or elevator cage will be prevented from over-hoisting within a mine or other shaft, thus obviating injury to the hoisting mechanism, should the same continue in operation after the arrival of the lift or cage at the head or top of the shaft.

A still further object of the invention is the provision of a device of this character which is automatic in operation, and that is simple in construction, thoroughly reliable and efficient in its purpose, and inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a fragmentary front elevation of a shaft and lift or cage with the invention connected thereto. Fig. 2 is a similar view, showing the cage or lift anchored within the shaft after the same has arrived at the head thereof, and the lifting cable released. Fig. 3 is a fragmentary vertical sectional view through the releasing mechanism of the device, the bridle chains being held fast thereto, as is shown in Fig. 1. Fig. 4 is a similar view, showing the bridle chains released from the said releasing portion of the device. Fig. 5 is a sectional view on the line 5—5 of Fig. 1. Fig. 6 is a sectional view on the line 6—6 of Fig. 1. Fig. 7 is a sectional view on the line 7—7 of Fig. 5. Fig. 8 is a sectional view on the line 8—8 of Fig. 5. Fig. 9 is a vertical sectional view through the anchoring mechanism for the cage of the device. Fig. 10 is a similar view looking toward the opposite face of the anchoring mechanism. Fig. 11 is a sectional view on the line 11—11 of Fig. 5. Fig. 12 is a fragmentary sectional view of the releasing head of the device.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, 5 designates opposed vertical guide rails or tracks arranged in the ordinary well-known way within a mine or other elevator shaft, and 6 the lift or cage adapted to travel on the said rails or tracks in the usual manner, the cage or lift 6 being of any well-known construction provided with a central cross beam 7 at its top, in which is located a medial eye bolt 8 which is fixed thereto by means of a nut 9. The eye bolt has connected thereto a coupling yoke or clevis 10 by means of a pivot 11, the yoke 10 being connected to anchoring mechanism, as will be hereinafter more fully described.

The cage or lift 6 is raised and lowered within the shaft upon the guide rails or tracks 5 by means of a lifting cable 12, which is operated in the usual manner by suitable machinery (not shown). Carried by the cable 12 is a releasing mechanism, comprising clamping plates or sections 13, each being provided at its inner face with a central longitudinally extending rope receiving groove, the grooves in the sections being adapted to register with each other

for receiving the cable 12, and the said sections are clamped to the cable 12 by means of bolt members 14, the plates 13 being cut away at their inner faces to form a bifurcation therebetween at their lower ends, in which bifurcation are disposed trip catches 15 arranged at opposite sides of the cable 12, the catches being connected to the plates 13 by means of pivots 16, whereby they may swing outwardly beyond the body of the clamp or within the bifurcation between the said plates, so as to not protrude beyond the said clamp. Within the bifurcation beneath the catches 15 are pivoted links 17, the latter carrying at their free ends keeper eyes 18 which are connected to the links 17 by means of pivots 19, the keeper eyes 18 being adapted for normal engagement with the catches 15, and the end links of upwardly converging bridle chains 20, the same being connected to the cross beam 7, near opposite ends thereof, of the cage or lift 6, when the latter is being raised or lowered within the mine or other shaft by the hoisting mechanism. These catches are sustained in their normal position of engagement with the keeper eyes 18 by means of copper rivets 21, the same being passed therethrough and through the clamping plates 13, the keeper eyes 18 being also sustained in engagement with the catches by means of copper rivets 22 engaged with the said catches. However, the rivets 21 will be sheared, whereby the same will become severed for the disengagement of the catches 15 from the keeper eyes 18 and also the copper rivets 22 will be sheared to release said keeper eyes 18 from the catches, in a manner as will be hereinafter more fully described.

Disposed at the head of the mine or other shaft, or near the same, and fixed to the guide rails or tracks 5 is a central perforated suspension plate 23, through the perforation of which travels the lifting cable 12, the said plate 23 being disposed transversely in the shaft, so that the same will lie within the path of movement of the noses 24 formed on the catches 15 of the clamping mechanism carried by the lifting cable 12, so that when the hoisting machinery is in operation and the lift or cage has ascended, whereby the noses 24 will strike the plate 23, then the rivets 21 will be severed and the catches 15 moved inwardly within the clamping mechanism, thus causing the rivets 22 to be severed by the keeper eyes 18, whence the latter will gravitate to the position shown in Fig. 2, thereby releasing the bridle chains so that on the further ascension of the lift or cage 6, it will become anchored within the shaft and the lifting cable 12 automatically released from the said lift or cage, in a manner as will be hereinafter more fully described.

The anchoring mechanism comprises a pair of spaced parallel plates 25 and 26, respectively, the same being united in any suitable manner, one of which being formed at its lower end with vertical guide sleeves 27, in which are mounted for sliding movement plunger stems or rods 28, the free ends of which are provided with heads 29 which limit the movement thereof in one direction in the said sleeves 27. The stems or rods 28 carry copper rivets 30 which engage in the sleeves 27 to lock them normally against movement. These stems or rods 28 are mounted in a bumper frame or block 31 provided with a suitable opening, through which project the plates 25 and 26, and surrounding the said guide rods or stems 28 between the bumper frame or block 31 and the inner ends of the sleeves 27 are coiled expansion springs 32 which serve to sustain the said bumper frame or block 31 spaced from the said sleeves 27 and the heads 29 of the guide stems or rods 28 in abutting relation to the said sleeves 27.

Pivottally connected to the lower ends of the plates 25 and 26 is a coupling clevis 33, the same being connected to the coupling clevis 10 carried by the eye bolt 8 on the cross beam 7 of the lift or cage, for connecting the anchoring mechanism to said lift or cage.

Arranged between the plates 25 and 26 of the anchoring mechanism are locking dogs or catches 34 which are connected to the said plates by means of pivots 35, the locking catches or dogs 34 being normally retracted by means of the bumper frame or block 31, when the latter is in normal position. Arranged against the outer face of the plate 25 is a pair of hook-like locking members 36, the same being adapted for movement toward and away from each other and are provided with suitable sockets, in which are fitted the inner ends of coiled expansion springs 37, the outer ends of which are engaged in suitable sockets formed in the bumper block or frame 31, the springs being designed to normally hold the locking members 36 retracted. The locking members 36 are provided with transverse guide grooves 38, in which engages the guide rib 39' formed on one wall of the opening in the bumper block or frame 31. Thus, it will be seen that the said locking members 36 will be guided in their outward and inner movements away from and toward each other, and also the said members 36 will be moved simultaneously with the bumper block or frame 31, in a manner as will be hereinafter more fully described.

Suitably mounted upon the plate 25 at the outer face thereof is a substantially cone-shaped spreading element 39, the latter being arranged in the path of movement of the locking members 36 which are provided

with curved friction surfaces 40, engageable with the spreading member 39, whereby the said locking members 36 will be separated when the bumper block or frame 31 is lowered from normal position, for a purpose as will be hereinafter more fully described. This spreader member is provided with recesses 41, in which are pivoted locking pawls 42, the latter being normally extended outwardly of the said recesses 41 by means of expansion springs 43 and are adapted to engage in suitable notches 44 formed in the inner faces of the locking members 36, so that when the latter are lowered from normal position, they will be engaged by the pawls 42 and locked thereby to the expanding element 39, so as to sustain the same against displacement, for a purpose as will be hereinafter more fully described.

Insertible between the plates 25 and 26 and the locking dogs or catches 34, is a draw wing 45 of a releasable head 46 pivotally connected, as at 47, to a coupling member 48 carried at the free end of the hoisting cable 12, the draw wing 45 being of flared formation, or substantially triangular or wedge-shaped, so that it will be locked between the plates 25 and 26 by the catches or dogs 34, when in retracted position, thereby uniting the releasing head 46 with the anchoring mechanism, so that the cage or lift 6 may be raised and lowered within the mine or other shaft.

In the upward travel of the lift or cage 6 on its arrival at the head of the shaft, the suspension arms 23 will primarily release the catches 15, thereby freeing the bridle chains 20, and should the hoisting machinery continue in operation, the cage or lift will continue in its upward flight in the shaft, whereupon the bumper block or frame 31 will strike the said suspension arms 23, be arrested thereby and as the cage or lift continues its upward flight the hoisting cable 12 will exert a pulling action upon the anchoring mechanism, that is to say, the plates 25 and 26. Thus, the copper rivets 30 will become sheared and the sleeves 27 on the plates will slide upwardly upon the guide stems or rods 28, compressing the springs 32 between the same and the bumper block or frame 31. The upward movement of the plates 25 and 26 causes the spreader element 39 to approach the locking members 36 and enter therebetween, thereby spreading the same which shifts them outwardly for their automatic engagement with the suspension arms, resulting in the locking of the anchoring mechanism thereto. As these locking members 36 engage with the suspension arms 23, the locking dogs or catches 34 will be drawn outwardly to also engage with the suspension arms 23 by the pulling exertion of the hoisting cable 12 which causes the draw wing 45 to be released from between

the said catches or dogs 34, whereupon the said hoisting cable will be freed from the anchoring mechanism and simultaneously the anchoring mechanism will be locked to the suspension arms 23, thereby sustaining the lift or cage fixed in the mine or other shaft, at the head thereof, thus preventing any possibility of the same dropping therein.

It will be evident that when the hoisting cable 12 is released in this manner, it will overcome any possibility of resultant injury to the hoisting machinery, should the same continue in operation after the cage has been arrested at the top of the mine or other shaft. When it is desired to again attach the hoisting cable to the anchoring mechanism and to release the latter from the suspension arms 23 whereby the cage or lift may be lowered in the mine, it is only necessary for an operator to reset the parts of the releasing mechanism that is to say, insert the draw bar 45 in position between the plates 25 and 26 and the locking dogs or catches, then release the same from their engagement with the suspension arms 23. Likewise, it will be necessary to free the hook-like members 36 from their engagement with the suspension arms 23. Thus the hoisting cable 12 will be connected to the anchoring mechanism and the latter will be freed from the suspension arms, whereupon the cage or lift 6 may be lowered to the requisite degree within the mine or other shaft, and the said operator then will attach the bridle chains 20 to the catches 15 of the clamping means carried by the hoisting cable, so that the cage or lift may be again ready for its descending and ascending movements in the mine or other shaft by the hoisting machinery.

It is apparent that the lift or cage will be prevented from being raised above the desired point or too close to the sheave over which is trained the hoisting cable 12 controlled by the hoisting machinery (not shown), thereby obviating any injury to the latter, and at the same time preventing the cage or lift from falling within the mine or other shaft.

From the foregoing, it is thought that the construction and operation of the invention will be readily understood, without requiring a more extended explanation, and therefore the same has been omitted.

What is claimed is:

1. The combination with a lift, of a hoisting cable therefor, anchoring mechanism connected with the cable and said lift, stationary means arranged within a shaft within which the lift travels and in the path of movement of the anchoring mechanism to simultaneously release the cable from the anchoring mechanism and to lock the latter to the said stationary means to prevent the falling of the lift, and bridle chains con-

nected with the lift and automatically released by said stationary means prior to its engagement with the anchoring mechanism.

2. The combination with a lift, of a hoisting cable therefor, anchoring mechanism connected with the cable and said lift, stationary means arranged within a shaft in which the lift travels and in the path of movement of the anchoring mechanism to simultaneously release the cable from the anchoring mechanism and lock the latter to the said stationary means to prevent the falling of the lift, clamping means carried by the cable, and bridle chains connected with the lift and detachably engaged with the clamping means for their automatic release therefrom by the stationary means.

3. The combination with a lift, of a hoisting cable therefor, coupling means connected with the lift and the said cable, stationary means arranged within a shaft within which the lift travels and in the path of movement of said coupling means for releasing the same, means carried by said coupling means and engageable by said stationary means to lock the said coupling means to the stationary means, clamping means arranged on the cable above the coupling means, and flexible connections between the lift and the clamping means and automatically releasable therefrom prior to the locking engagement of the coupling means with the stationary means.

4. The combination with a lift, of a hoisting cable therefor, coupling means connected with the lift and the said cable, stationary means arranged within a shaft in which the lift travels and in the path of movement of the said means for releasing the same, means carried by the said coupling means and engageable by the said stationary means to lock the said coupling means to the stationary means, means for simultaneously releasing the cable from the coupling means on the locking thereof with the stationary means, bridle chains carried by the lift, and means on the cable for normal attachment of the bridle chains therewith and adapted to be primarily released from the said chains prior to the engagement of the coupling means with the stationary means.

5. The combination with a lift, of stationary means arranged within the shaft within which the lift travels, a hoisting cable, separable coupling mechanism carried by the cable and the said lift for connecting the same and engageable with the said stationary means for the uncoupling thereof, means on the cable spaced from the said coupling mechanism, flexible connections between the lift and the said last-named means and releasable when the latter is engaged with the stationary means prior to the uncoupling of the coupling mechanism.

6. The combination with a lift, of a stationary means arranged within a shaft within which the lift travels and in the path of movement of the said lift, a hoisting cable, anchoring means connected with the said lift and detachably engaged with the cable and adapted to be automatically released upon engagement with the stationary means, whereby the lift will be arrested and the cable simultaneously released therefrom, and supplemental releasable means connected with the cable and the lift and adapted to be primarily freed prior to the arresting of the lift by the said stationary means.

7. The combination with a lift, of stationary means arranged within the shaft within which the lift travels, a hoisting cable, separable coupling mechanism carried by the cable and the said lift for connecting the same and engageable with the said stationary means for the uncoupling thereof, means on the cable spaced from the said coupling mechanism, flexible connections between the lift and the said last-named means and releasable when the latter is engaged with the stationary means prior to the uncoupling of the coupling mechanism, and means cooperative with the separable coupling mechanism and adapted for locking engagement with the stationary means for arresting the lift simultaneously with the uncoupling of said separable coupling mechanism.

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

WILLIAM BALL.

Witnesses:

GEO. WOOD,
CHAS. BERGER.