March 14, 1933. J. DUNLOP 1,901,635

SLACK CABLE TAKE-UP DEVICE

Filed May 31, 1930

Fig. 1.

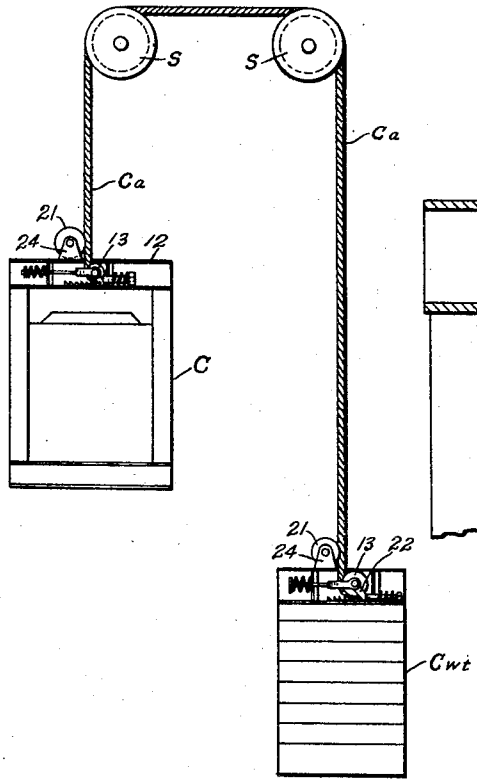



Fig. 3.

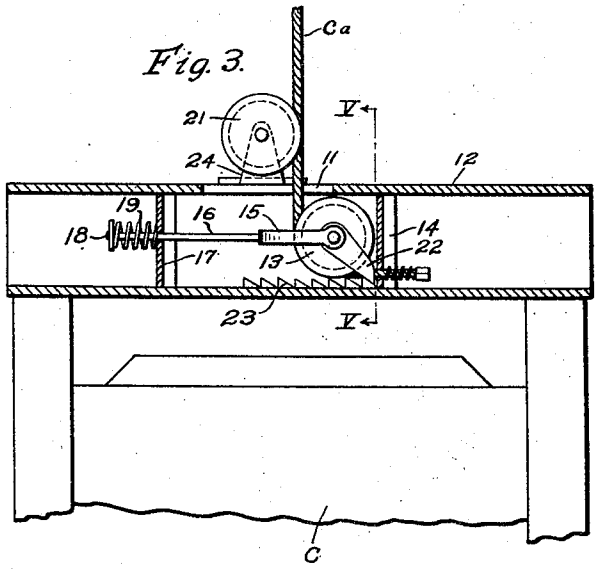



Fig. 2.

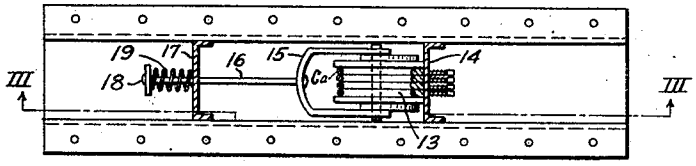



Fig. 5.

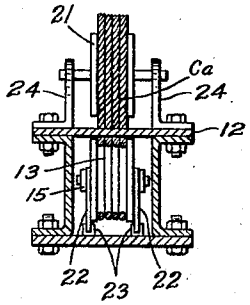
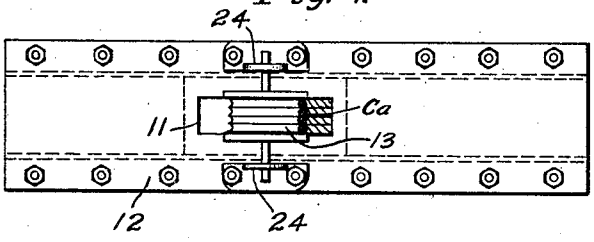



Fig. 4.




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Patented Mar. 14, 1933 1,901,635

# UNITED STATES PATENT OFFICE

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## SLACK CABLE TAKE-UP DEVICE

Application filed May 31, 1930. Serial No. 457,966.

My invention relates to a safety device for elevators, and more specifically to a device for taking-up the slack cable to prevent either the car or the counterweight falling back and snapping the cable when the descent of the other body has been suddenly retarded.

When an elevator car is moving downward at a sufficiently high rate of speed to trip the car safety and the safety is set, the counterweight which has been ascending does not stop as rapidly as does the car and by reason of its inertia will continue to ascend until the cables are slack. The counterweight will then drop back pulling the cables taut and frequently either breaking the cables or pulling them away from the car or the counterweight. This will also occur if the car is stopped suddenly by striking the buffer or in any other manner.

If, when traveling in the opposite direction, the counterweight is caught and stopped suddenly, the car, which is ascending at a high rate of speed, will continue traveling upwardly after the counterweight has stopped moving. This will cause a slack condition in the cable supporting the car and, when the car stops by gravity and starts descending, it will draw the cables taut with such a snap that they are apt to be broken or pulled loose from the car.

Such conditions are especially apt to occur in high speed elevator systems, because of the high rate of speed at which the car or the counterweight is ascending when the other body is stopped.

It is, accordingly, an object of my invention to provide means for preventing the occurrence of slack cables with the consequent falling back of either the car or the counterweight, when the motion of the other body has been suddenly retarded.

It is also an object of my invention to provide a device for taking up any slack cable which may occur to prevent the falling back of either the car or the counterweight.

In accordance with my invention, the cables are attached to the counterweight and/or the car by means of a ratchet device biased by a spring, so that, in the event of the slackening of the cables, the spring will take up the slack, keeping the cables taut and preventing the back lash above referred to.

The invention, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, in which:

Figure 1 is a diagrammatic view representing an elevator system having slack cable take-up devices applied thereto in accordance with my invention.

Fig. 2 is a top plan view of a slack cable take-up device with the top plate and pulley removed.

Fig. 3 is a detail view taken along the section line III—III of Fig. 2.

Fig. 4 is a similar view to Fig. 2 but with the top plate and pulley in place.

Fig. 5 is a view taken on section line V—V of Fig. 3.

Referring to the drawing, I have shown in Fig. 1 a car C supported by cables C*a* and counterbalanced by a counterweight C*wt* in the usual manner.

In extending to their point of attachment on either the car or the counterweight the cables C*a* pass through an opening 11 in a top plate 12 (shown in Fig. 4), thence around a spring tensioned movable pulley 13 and through a partition member 14 where they are anchored in any suitable manner as shown in Fig. 3.

By reference to Figs. 2 and 3, it will be seen that the pulley 13 is pivotally attached to a movable sling 15. A rod 16 is attached at one end to the sling and passes slidably through a partition member 17 where the other end of the rod terminates in a head 18. A compression spring 19 is provided on the rod in concentric relation therewith, and is compressed between the partition member 17 and the head 18 of the rod.

It will be apparent that the spring 19 introduces a force which tends to move the pulley 13 toward the partition member 17. This force is normally resisted by the tension of the hoist cables C*a* caused by the weight of

the car. But if the tension on the cables is released for an instant, the spring 19 will move the pulley 13 toward the left, thereby drawing up the slack around a stationary idler pulley 21. In order to prevent the pulley 13 moving back to its normal position when the tension of the cable is resumed, a suitable latch or pawl 22 and cooperating rack gear 23 are provided, as shown in Fig. 3.

The stationary idler pulley 21 may be pivotally mounted above the cross-head between a pair of brackets 24 mounted on the top plate 12, as shown in Fig. 5. The idler pulley 21 serves to increase the amount of slack cable that will be taken up by a given movement of the movable pulley, and prevents the shifting of the suspension point and consequent unbalancing of the car or the counterweight when the device operates.

It will, therefore, be seen that I have provided a device which will take up the slack cable and will prevent either the car or the counterweight falling back and snapping the cables when the downward motion of the other body has been suddenly retarded.

I do not wish to be restricted to the specific structural details, and arrangement of parts herein set forth, as various modifications thereof may be effected without departing from the spirit and scope of my invention. I desire, therefore, that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. In a slack cable take-up device for elevators, an elevator car, a hoist cable for supporting the car, a movable pulley carried by the elevator car, a spring for biasing the pulley into deflecting relation with the tensioned hoist cable, said spring having insufficient strength to displace said cable while it is normally tensioned by the weight of the car, a pawl or latch carried with the movable pulley, stationary rack teeth cooperating with said pawl or latch to prevent movement of the pulley in a direction in opposition to the biasing spring by the tension of the cable, and a stationary idler pulley mounted to engage the hoist cable on the opposite side and above the movable pulley.

2. In a slack cable take-up device for elevators, an elevator car, a hoist cable for supporting the car, a movable pulley carried by the elevator car, a spring for biasing the pulley into deflecting relation with the tensioned hoist cable, said spring having insufficient strength to displace said cable while it is normally tensioned by the weight of the car, a pawl or latch carried with the movable pulley, stationary rack teeth cooperating with said pawl or latch to prevent movement of the pulley in a direction in opposition to the biasing spring by the tension of the cable.

3. In a slack cable take-up device for elevators, an elevator car, a hoist cable for supporting said car, a movable pulley carried by the elevator car, a spring for biasing the pulley into deflecting engagement with the cable, said spring having insufficient strength to displace the cable while it is normally tensioned by the weight of the car and a stationary idler pulley mounted to engage the hoist cable on the opposite side and above the movable pulley.

In testimony whereof, I have hereunto subscribed my name this twenty-second day of May, 1930.

JAMES DUNLOP.