Aug. 23, 1932. E. N. BALDWIN 1,873,809

SAFETY DEVICE FOR ELEVATORS

Filed June 16, 1930

FIG. 1.

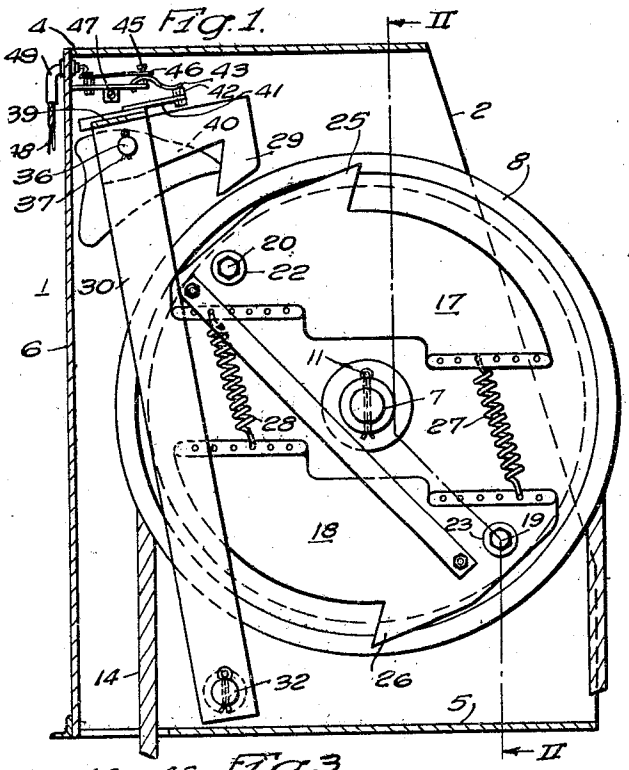


FIG. 2.

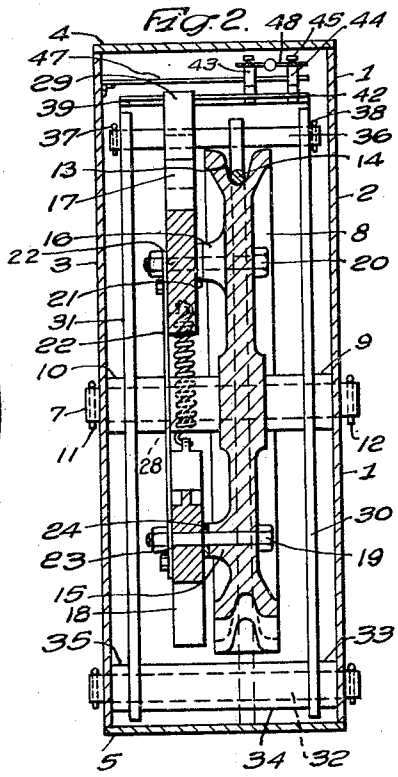
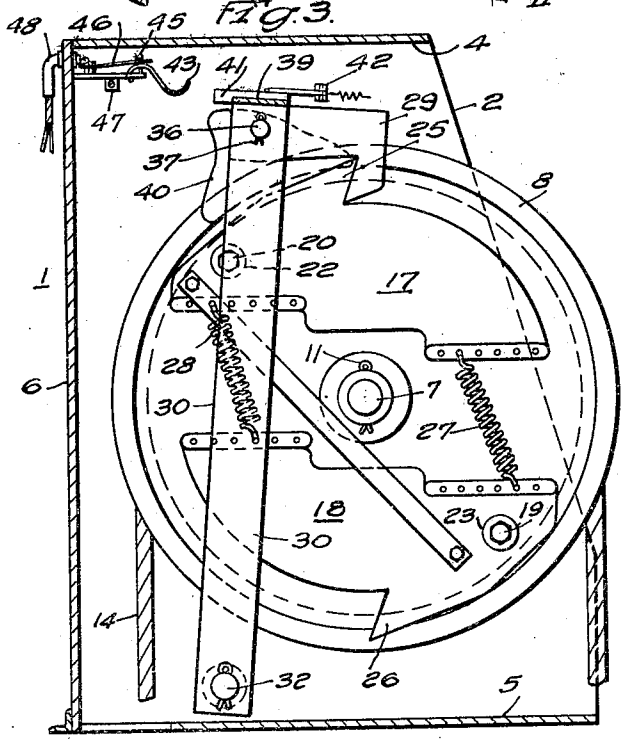


FIG. 3.



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UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR ELEVATORS

Application filed June 16, 1930. Serial No. 461,282.

My invention relates to improvements in safety devices for elevators and more particularly to safety covers for automatic speed-governing devices.

The principal object of my invention resides in the provision of a novel protective cover for a speed-governing device which will protect the governor from injury or from unintentional operation and serve as a support for an interlocking switch element associated with said governing device.

Another object of my invention is the provision of a novel protective cover for a speed-governing device which shall be simple in construction and economical to manufacture.

Another object of my invention is the provision of a unitary cover and switch-element support which shall be compact, easy to assemble and comprise a minimum number of parts.

In the accompanying drawing, which illustrates a preferred embodiment of this invention and in which similar reference numerals refer to similar parts in the different views,—

Figure 1 is an elevational view, partly in section, of my invention, showing an interlocking switch and cooperating governor parts, with the latter in normal operative position;

Fig. 2 is a sectional side view on line II—II of Fig. 1; and

Fig. 3 is a side elevational view showing the position that the elements of Fig. 1 assume when the safety device is applied, and the switch is opened.

In elevator practice, it is customary to employ a speed-governing device which, in the event the car over-speeds, is operative to trip safety devices to cause interruption of the main control circuits and the clamping of governor rope against movement so that it will be pulled away from the car to set a safety-grip stopping device into operation to mechanically bring the car to a safe stop.

Such speed-governing devices are ordinarily placed in the elevator pent house in an open and unprotected position. The various attendants whose duty it is to care for the elevator, frequently come into contact with the governor unintentionally, and cause it to trip needlessly, thereby interrupting the elevator service until such time as the governor cable can be again attached to the car.

In order to eliminate this source of trouble, I have provided a protective covering for a governor which will serve a double purpose; viz, to protect the governor from accidental operation and, at the same time, provide a support for the contact members of an interlocking switch which is adapted to be operated by the governor to open the elevator power circuit. I am aware that a governing device has been used in the past to operate an interlocking switch or similar device but I am not aware of any construction whereby one device is arranged to not only protect the governor but also to form a support for a switch or any other like device.

As illustrative of the present invention, I have shown, in the accompanying drawing, a speed-governing device comprising a housing 1 constructed of a pair of side walls 2 and 3 to which are secured, in any suitable manner, as by welding, a top 4, a base 5 and a back 6. Journaled in suitable openings in the side walls 2 and 3 is a shaft 7 upon which is rotatably mounted a sheave 8. The sheave 8 is restrained from lateral movement on the shaft 7 by means of suitable cylindrical fillers 9 and 10 which are constructed as sleeves for the shaft 7 to maintain the proper spacing of the sheave 8 from the side walls 2 and 3.

The shaft may be secured against lateral movement by means of suitable cotter-pins 11 and 12. The sheave 8 is provided with a rope groove 13 in the outer periphery thereof in which the endless governor rope 14 may be seated as it passes over the governor sheave. The governor rope 14 may be suitably secured to an elevator car and to the safety-grip devices on the car in the conventional manner.

I have illustrated a pair of governor weights 17 and 18 secured upon suitable bosses 15 and 16, projecting from the side of the sheave 8 at points on diametrically opposite sides of the shaft 7. The weights 17 and 18 should be pivotally secured to the sheave 8, as by means of suitable bolts 19

and 20 and suitable spacing washers 21, 22, 23 and 24 which act as anti-friction members to ensure free rotation of the governor weights upon the bolts 19 and 20. The governor weights are provided with radially extending latching lugs 25 and 26.

It will be understood from the foregoing description that, as the car with which the governing device is associated moves upwardly or downwardly in its shaft, the governor rope 14 will cause the sheave 8 to be rotated in accordance with the direction and speed of movement of the elevator car. The rotation of the sheave 8 will cause the governor weights 17 and 18 to be thrown outwardly by centrifugal force to cause the latching lugs 25 and 26 to project beyond the outer periphery of the sheave 7. However, to normally restrain the governor arms against centrifugal force, a pair of springs 27 and 28, inter-engaging the two governor weights, tends to hold the weights in a retracted position. The springs 27 and 28 may be of any suitable strength to take care of the variation in speed and other factors which bear on the design of different types of elevators and governors therefor. A latch 29, to be engaged by the lugs 25 or 26 of the governor weights 17 and 18 when projected by centrifugal force as the governor sheave 8 is rotated at a speed sufficiently great to cause the weights 17 and 18 to overcome the tension of springs 27 and 28, is suitably mounted upon a movable bracket comprising a pair of arms 30 and 31 located on opposite sides of the governor sheave 8. The lower ends of the arms 30 and 31 are journaled upon a bearing or shaft member 32 which, in turn, is secured in suitable openings in the side walls 2 and 3 of casing 1. Lateral movement of the arms 30 and 31 is prevented by means of spacing sleeves 33, 34 and 35. The latch member 29 is pivotally attached to the upper portion of the arms 30 and 31 by means of a shaft 36 which passes through suitable openings in the arms 30 and 31 and latch member 29 and is secured against displacement by means of suitable cotter pins 37 and 38. The upper ends of the arms 30 and 31 are connected, by means of a cross head 39, to which the arms 30 and 31 may be secured in any suitable manner as by welding. Mounted upon the same shaft 36 which supports the latch member 29 is a brake shoe 40 of such size and configuration as to engage the governor rope 14 when the latch member 29 is engaged by the lugs 25 or 26 and the arms 30 and 31 moved to their operative position, as shown in Fig. 3. It will be observed that the point of support 32 for the arms 30 and 31 is in such relation to the axis of rotation of the governor shaft 8 that, when the latch member 29 and arms 30 and 31 are drawn to the right, the clamping shoe 40 is drawn into a clamping engagement to act as a brake against the governor rope 13 to prevent further movement of the governor rope 14.

Secured upon the cross head 39, as by means of suitable insulating material 41, I have illustrated a bus bar or bridging member 42 which bridges a pair of contact members 43 and 44 when the latch member 29 and the arms 30 and 31 are in their normal extreme left-hand position. The contact members 43 and 44 may be of any suitable character but I have illustrated the same as comprising contact pieces pressed into bridging position, as by means of adjusting screws 45 and springs 46 which serve to secure the contact members to an insulating support 47 carried by the side wall 3 of the governor 1.

The contact members 45 may be connected in the main control circuit for the elevator car through conductors 48 which pass through the conduit 49. It will be apparent that a separation of the bus bar 44 from the contacts 45, resulting from an operation of the governor, will interrupt the circuit to the hoisting motor simultaneously with the application of the cable brake.

In the operation of the safety device, when the speed of the car becomes excessive, the speed of rotation of the sheave 8 is correspondingly increased through its connection by the cable 14 to the car. At a predetermined limiting overspeed, dependent upon the tension of the springs 27 and 28, the governor weights 17 and 18 will be moved outwardly by centrifugal force, whereupon one of the latching lugs 25 and 26 will engage the latch 40, thereby moving the arms 29 and 30 forwardly until the shoe 41 engages the cable 14. The interlocking of lug 25 or lug 26 with the latch 40 and the subsequent gripping of the cable 14 by the shoe 41 provides a positive stop of the cable, whereupon a safety device mounted upon the elevator car is operated by movement of the car relatively to the now stationary cable. Operation of the safety device brings the car to rest immediately.

Simultaneously, upon forward movement of the arms 29 and 30, the bus bar 44 will be moved forwardly to unbridge the members 45, whereby the main circuit to the hoist-operating motor is interrupted.

Various changes may be made in the specific embodiment of the construction described without diverting from the spirit of the invention or departing from the scope of the appended claims.

I claim as my invention:

1. In a speed-governing device, in combination, a sheave, a cable for driving said sheave, a pivoted arm associated with said sheave, said arm having a latching portion, pivoted brake arm, latching means on said brake arm to cooperate with said latching portion, a shoe secured to said brake arm and adapted to move therewith to engage said

cable, a switch, and means cooperating with said brake arm for opening said switch.

2. In a speed-governing device, in combination, a sheave, a cable for driving said sheave, a pivoted arm associated with said sheave, said arm having a latching portion, a pivoted brake arm, latching means on said brake arm and cooperating with said latching portion, a shoe secured to said brake arm and adapted to move therewith to engage said cable, a switch, a fixed support, the contacts of said switch being mounted on said support, said switch contacts being operable by said brake arm.

3. In a speed governing device for an elevator, in combination, a sheave, a cable for driving said sheave, a pivoted arm associated with said sheave, a brake-arm, cooperating latching means on said pivoted arm and brake-arm, a switch, and means on said brake-arm for opening said switch and engaging said cable.

In testimony whereof, I have hereunto subscribed my name this 12th day of June, 1930.

EDWARD N. BALDWIN.