H. F. GURNEY.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED AUG. 3, 1910.

1,058,299.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 1.

Fig. 1,

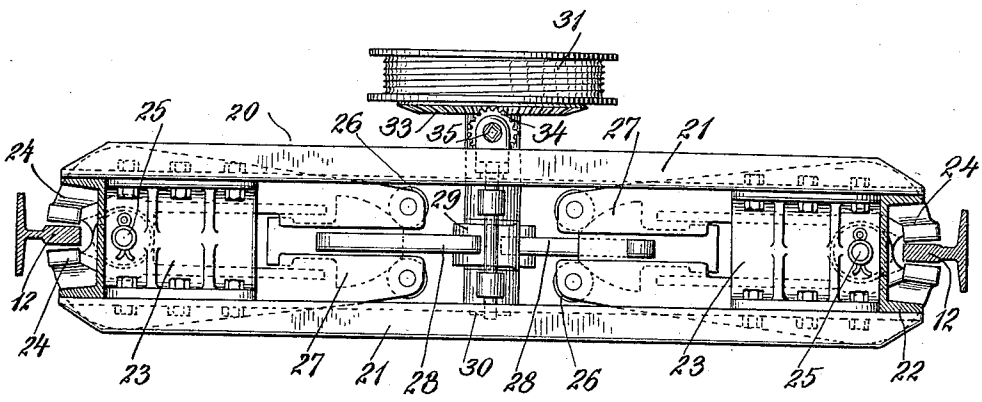
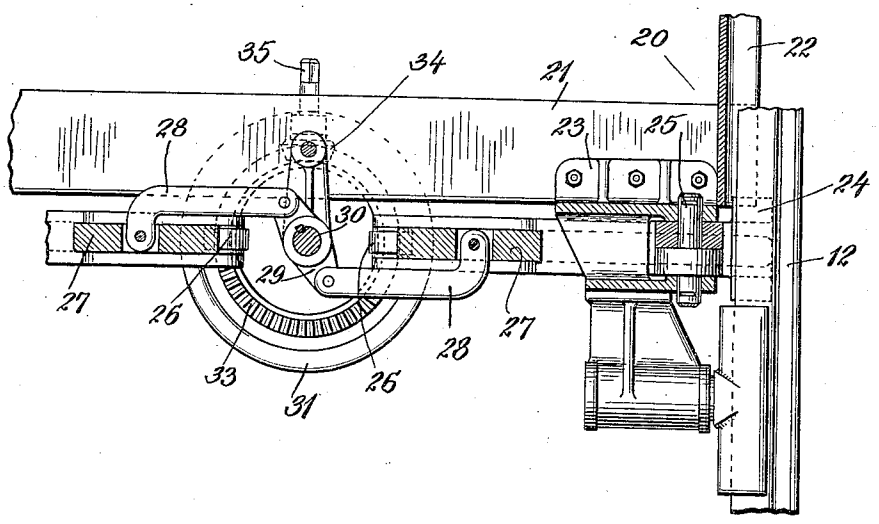


Fig. 2,



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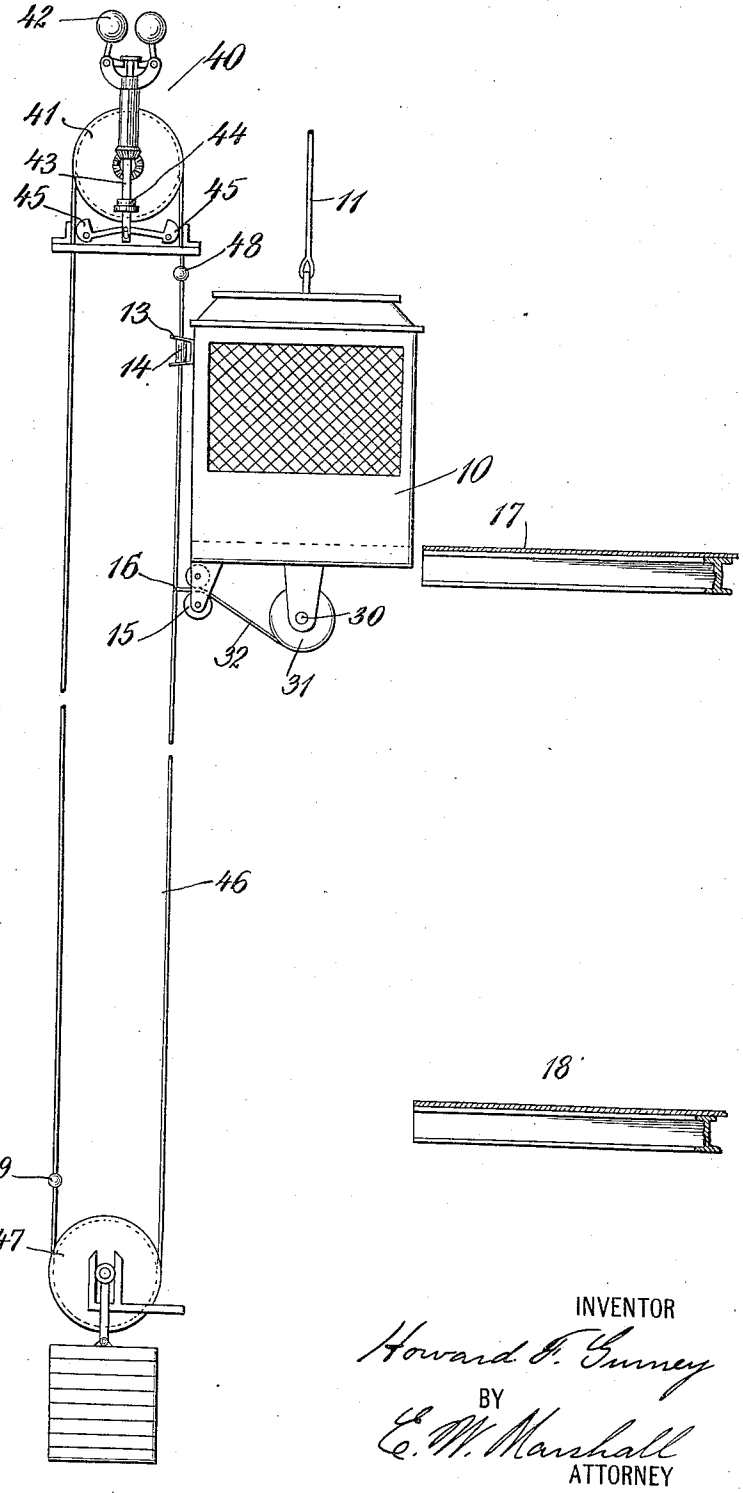
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Fig. 3.



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SAFETY DEVICE FOR ELEVATORS.

1,058,299. Specification of Letters Patent. Patented Apr. 8, 1913.

Application filed August 3, 1910. Serial No. 575,212.

To all whom it may concern:

Be it known that I, HOWARD F. GURNEY, a citizen of the United States, and a resident of Hackensack, in the county of Bergen and State of New Jersey, United States of America, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

My invention relates to safety devices for elevators and especially to means for operating them so as to prevent accidents from the car overrunning the limits of its travel.

I will describe my invention in the following specification and point out the novel features thereof in the appended claims.

Referring to the drawings, Figure 1 is a plan view of a well known type of elevator safety devices. Fig. 2 is a side elevation of a portion of this device on a somewhat larger scale and with some of its parts shown in section. In Fig. 3 I have shown more or less diagrammatically an elevator car on which is such a safety device together with a speed governor connected with the car and with the safety device, and with additional means for actuating the safety device according to my invention.

Like characters designate corresponding parts in all of the figures.

10 designates an elevator car, and 11 its hoisting cable.

12, 12 are the guides over which the car is arranged to run and with which the jaws of the safety device may engage to arrest the movement of the car.

20 is the frame of the elevator safety device. This is arranged to be affixed to the car and comprises a pair of horizontal girders 21 which are affixed to the lower ends of channel-irons 22 which form a part of the framework of the car. Brackets 23 affixed to the ends of the girders support clamping jaws 24 which are pivoted therein at 25. The inner ends of these jaws are provided with antifriction rollers 26. The clamping jaws are so constructed that each pair of them slidably supports an actuating wedge 27 between the antifriction rollers. Links 28, 28 connect the wedges with a yoke 29 which is keyed to an actuating shaft 30. 31 is a rope drum which is also affixed to the shaft 30. One end of a rope 32 is fastened to this drum and the rope is wound around it. On one side of the drum is a bevel-gear 33 with which a pinion 34 engages. The spindle on which the pinion is mounted is squared off at the top as shown at 35 so that the pinion and the drum may be rotated from the car by hand. This arrangement is provided for the purpose of resetting the safety device after it has been actuated.

40 is a centrifugal governor which comprises a sheave 41 by means of which through suitable gearing a pair of balls 42 may be rotated. The centrifugal effect of these rotatable balls is arranged to raise a vertical rod 43 on which is a fixed weight 44.

45, 45 are rope clamps arranged to be actuated by the rod 43.

46 designates a governor rope which runs down through the elevator well and under a weighted sheave 47 which keeps this rope in driving engagement with the sheave 41.

13 is a light flexible leaf spring affixed to the outside of the elevator car 10 and in engagement with a stop-ball 14 on the governor rope. This arrangement is of sufficient strength to carry the governor rope along with the car when the movement of the rope is not checked so that the governor will be driven thereby at a speed proportional to the rate of movement of the car. The safety device rope 32 is carried between a pair of guide-pulleys 15 on the car and is affixed to the governor rope as at 16.

17 designates the upper landing at which the car is arranged to stop, and 18 is its lower landing. For the sake of simplicity the intervening landings are not shown in the drawings.

When the speed of the car becomes excessive the governor will actuate the rope clamps 45. These engage with the governor rope and hold it fast. Further movement of the car will cause the stop 14 to be pulled away from the spring 13 after which the movement of the car relative to the governor rope will cause a pull to be exerted upon the safety device rope 32 and to unwind the latter from the drum 31. Thus the drum and the shaft on which it is mounted will be rotated and the wedges will be drawn in between the antifriction rollers on the inner ends of the clamping jaws. The jaws will then be forced tightly against the guides 12 and will bring the car to rest.

All of the mechanisms which have so far been described and the operations are well known in the art and are common practice.

Accidents sometimes occur, however, from the car overrunning the limits of its travel either at the top or at the bottom, and these mechanisms have not been available, heretofore, for the purpose of avoiding accidents of this class, although many other expensive and cumbersome arrangements have been devised for preventing loss of life or limb from such accidents.

It is the purpose of this invention to provide means for setting a car safety device of some such type as that illustrated and described whenever the car runs beyond its upper or lower limits of travel. As an example of one way by which this result may be attained I have illustrated a simple device for this purpose in Fig. 3. In this case a stop-ball 48 is affixed to the governor rope in such a position that when the floor of the car 10 is level with the upper landing 17 this stop-ball will be a little way below the frame of the governor 40. Now, if the car should run above this landing the stop-ball will strike the frame of the governor and the movement of the governor rope will be arrested thereby. The safety device will then be actuated in the manner previously described. Another stop ball 49 is also affixed to the governor rope. This one is so placed that it will strike the frame of the governor when the car runs below the lower landing and will cause the safety device to be actuated to lock the car to the guides. It is to be noted that these devices do not depend at all upon the speed at which the car is running, but that they will effectively arrest its movement whether the car be running rapidly or slowly.

What I claim is.—

1. An elevator car, a safety device thereon, guides over which the car is arranged to run, a rope connected with the safety device and arranged to normally run with the car, and means for arresting the movement of the rope to thereby actuate said safety device to lock the car to the guides whenever the car overruns its path of travel.

2. An elevator car, a safety device thereon, guides over which the car is arranged to run, a rope connected with the safety device and arranged to normally run with the car, stop-balls affixed to said rope, and fixed abutments against which said balls strike whenever the car overruns its path of travel to arrest the movement of the rope to thereby actuate said safety device to lock the car to the guides.

3. An elevator car, a safety device thereon, guides over which the car is arranged to run, a speed governor, a governor rope connected therewith and arranged to normally run with the car, and a connection between said governor rope and the safety device, said governor being arranged to actuate the safety device whenever the speed of the car becomes excessive; combined with other means for actuating the safety device whenever the car overruns the limits of its travel.

4. An elevator car, a safety device thereon, guides over which the car is arranged to run, a speed governor, a governor rope connected therewith and arranged to normally run with the car, and a connection between said governor rope and the safety device on the car, said governor comprising means for checking the movement of the governor rope to thereby actuate the safety device whenever the speed of the car becomes excessive; combined with other means for checking the movement of the governor rope to actuate the safety device whenever the car overruns its path of travel.

5. An elevator car, a safety device thereon, guides over which the car is arranged to run, a speed governor, a governor rope connected therewith and arranged to normally run with the car, a connection between said governor rope and the safety device on the car, said governor comprising a frame, and a rope clamp for checking the movement of the governor rope to thereby actuate the safety device whenever the speed of the car becomes excessive, and stop-balls affixed to the governor rope and arranged to engage with the frame of the governor whenever the car overruns its path of travel to check the movement of the governor rope and to actuate the safety device.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOWARD F. GURNEY.

Witnesses:
ELLA LUCE,
W. L. O'CONNELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."