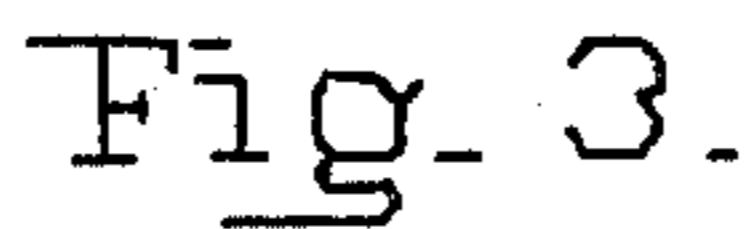
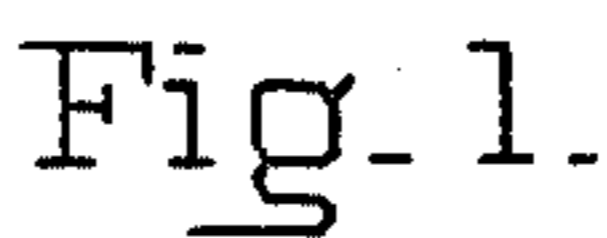


**Patented Mar. 26, 1901.**

(Application filed Aug. 27, 1900.)

(No Model.)



Inventor,

Vernon H. Yarnall

by Samuel W. Balch  
Attorney

# UNITED STATES PATENT OFFICE.

VERNON H. YARNALL, OF NEW YORK, N. Y.

## ELEVATOR SAFETY DEVICE.

SPECIFICATION forming part of Letters Patent No. 670,830, dated March 26, 1901.

Application filed August 27, 1900. Serial No. 28,147. (No model.)

*To all whom it may concern:*

Be it known that I, VERNON H. YARNALL, a citizen of the United States of America, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

My invention relates to devices applied to elevator-cars which are operated to grip the guides of the hoistway and check or stop the car whenever an excessive speed is attained by the car.

My invention, as hereinafter described and claimed, relates particularly to the manner of operating the jaws which grip such hoistway-guides through levers with eccentrically-pivoted gears on the ends thereof and rack-bars with parallel racks lying between and engaging with the eccentrically-pivoted gears. By this construction a compact arrangement of levers and operating means is secured. The rack-bars have a considerable range of movement, whereby they apply the grips with a greater mechanical advantage than is practicable with toggles placed between the levers, since toggles can be practically used through an angle of only about thirty degrees, and eccentric gears can be practically used through a third of a revolution, or four times the angle of toggles, and with a mechanical advantage which increases as the grip increases.

In the accompanying sheet of drawings, which form a part of this application, Figure 1 is an elevation showing the floor of a car, hoistway-guides, and the safety device with my improvement. Fig. 2 is a view of the safety device from underneath with the parts in their normal positions. Fig. 3 is a similar view showing the position of the parts when the safety device is operated.

The car 1 travels in the hoistway on the guides 2. Channel-beams 3 underlie the floor of the car and constitute the lower cross-head, to which the safety device is attached. Brackets 4 are attached to these beams, and as all these elements are rigidly attached together they will be regarded as a part of the car. Guide-shoes 5 are supported by the brackets. A pair of levers 6 are fulcrumed to each of these brackets, and opposing jaws or shoes 7 are attached to the outer ends of

the levers and lie on opposite sides of each of the guides. The levers are fulcrumed on pivots 8 in the brackets. On the inner ends of the levers are eccentrically-pivoted gears 9, there being two gears on opposite sides of each lever. The gears on each pair of levers are opposite, and between each pair of opposing gears is a rack-bar 10 with two parallel racks, which engage the gears. The rack-bars which operate the jaws in engagement with the guide on the left-hand side of the car are connected to a head 11 at the right-hand end of a spring 12, and the rack-bars which operate the jaws in engagement with the guide on the right-hand side of the car are attached by a rod 13 to a head 14 at the left-hand end of the spring.

Between the head 11 and a third head 15, which is attached to the rod 13, are toggles 16, which when straightened and latched by the latch 17 hold these heads apart and keep the spring in a state of compression. The latch is connected, through a rod 18, with one arm 19 of a rock-shaft 20. Another arm 21 on this rock-shaft is adjacent to the balls of a governor 22. When the car travels, this governor is revolved by a rope 23, which is connected through the top and bottom of the hoistway. The rope travels over an idler-sheave 24 and a sheave 25, on which the governor is mounted. The governor is adjusted so that the balls will throw out when the speed is excessive. The balls then strike the arm 21 and through the connecting parts draw the latch, thereby releasing the toggles and permitting the spring to expand. This pushes apart the heads 11 and 14 and draws up the rack-bars, thereby rotating the eccentric gears about a third of the revolution and forcing apart the ends of the levers to which the gears are attached and applying the shoes to the guide-rails, as shown in Fig. 3. At the start the centers of opposing gears are at right angles to a line between their pivots and the levers are rapidly operated; but as the grip increases the centers of the gears are brought nearly into line, with their pivots on the levers, and thus have a powerful toggle action when most needed.

I do not claim the particular manner of operating the rack-bars herein described, and I do not wish to limit myself to the specific

mechanism shown and described for operating the rack-bars, for my invention particularly resides in the combination of the rack-bars, eccentric gears, and levers, as specifically set forth in the claims.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with an elevator-car and hoistway with guides, of a safety device consisting of two pairs of levers fulcrumed to the car, opposing jaws attached to each pair of levers for gripping the guides, opposing gears eccentrically pivoted on the levers, a rack-bar with two parallel racks in engagement with each pair of opposing gears, and means for operating the rack-bars, substantially as described.

2. The combination with an elevator-car

and hoistway with guides, of a safety device consisting of two pairs of levers fulcrumed to the car, opposing jaws attached to each pair of levers for gripping the guides, opposing gears eccentrically pivoted on the levers, a rack-bar with two parallel racks in engagement with each pair of opposing gears, a spring for operating the rack-bars, means for latching the spring with the jaws open, and a governor for unlatching the spring to apply the grip, substantially as described.

Signed by me in New York city, New York, this 25th day of August, 1900.

VERNON H. YARNALL.

Witnesses:

SAMUEL W. BALCH,  
HENRY G. DORAN.