No. 889,833. PATENTED JUNE 2, 1908

D. K. WALLINGFORD.

SAFETY ATTACHMENT FOR ELEVATORS.

APPLICATION FILED AUG. 13, 1906.

Fig 1

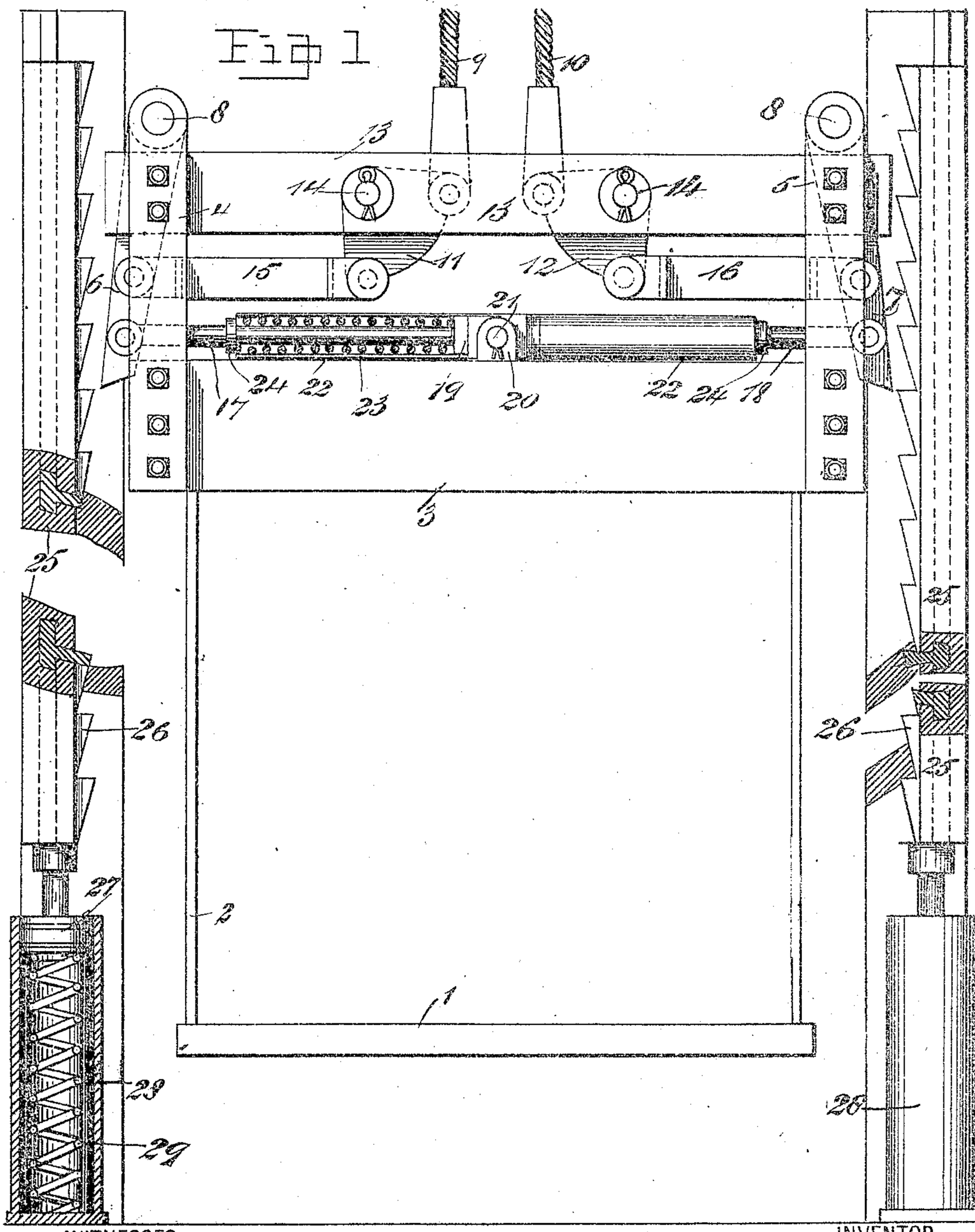
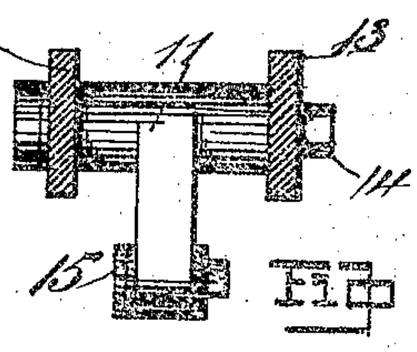


Fig 2



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SAFETY ATTACHMENT FOR ELEVATORS.

No. 889,833. Specification of Letters Patent. Patented June 2, 1908.

Application filed August 13, 1906. Serial No. 330,392.

To all whom it may concern:

Be it known that I, DANIEL K. WALLINGFORD, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Safety Attachments for Elevators, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in safety attachments for elevators, as will be hereinafter set forth.

The object of my invention is to provide a safety means for elevators whereby the jar produced by suddenly bringing the descending elevator car to rest will be practically eliminated; also, to provide a simple engaging means that will operate in connection with a suitable pneumatic cushioning means to reduce the strain of sudden stop or jar on the supporting parts of the elevator car. I attain these objects by means of the safety attachment illustrated in the accompanying drawings in which similar numerals of reference designate like parts throughout the several views.

Figure 1. is a part broken sectional elevational view of an elevator showing my invention of a safety attachment applied thereto, and, Fig. 2. is a transverse sectional view of the top beam portion of the elevator car.

The elevator car is composed of the floor 1 and the floor supporting uprights 2 which are secured to a suitable overhead beam 3. To the ends of the beam 3 are bolted the pawl-supporting standards 4 and 5 to the top of which are pivotally secured the depending pawls 6 and 7 by suitable hinge-pins 8.

The elevating cables 9 and 10 of the elevator car are connected to the ends of the horizontal arms of the bell-crank-levers 11 and 12, and the latter levers are hingedly connected to and between the beams 13 by the hinge-pins 14. Suitable connecting rods 15 and 16 connect the bottom ends of the depending lever arms of the said bell-crank levers 11 and 12 to the pawls 6 and 7.

Spring-rods 17 and 18 are connected at their outer ends to the pawls 6 and 7 at or near their bottom ends, and the said rods are connected to a suitable spring or springs whereby they are moved outwardly to cause the pawls 6 and 7 to swing into engagement with their opposing racks as hereinafter described. I prefer, however, to use the spring mechanism illustrated in the drawing in which a central spring thrust block 19 is hingedly connected to and supported by the eye-bolt 20 and the hinge-pin 21. The coil-spring casings 22 are secured on the ends of the spring thrust block 19 in any suitable manner to project horizontally and outwardly therefrom. Coil springs, such as the coil springs 23, are inclosed in the casings 22 and said coil springs surround the spring-rods 17 and 18 and bear at their inner ends against the thrust block 19 and at their outer ends against the collars 24 to force the spring rods 17 and 18 outwardly against the resistance of the pawls 6 and 7 due to the tension on the cables 9 and 10.

Suitable rack guides 25 are secured in the shaft or elevator way to extend vertically therein, and in these guides are fitted to slide longitudinally therein the side racks 26 which are adapted to be engaged by the pawls 6 and 7 when the latter are moved outwardly into their engaging positions. On the bottom ends of the said racks 26 are connected suitable air cylinder pistons 27 which are adapted to work in the air cushioning cylinders 28, so that when the racks 26 are suddenly forced downwardly they move the pistons 27 in said air cylinders 28 to compress the air confined in said cylinders which operates as a yielding or elastic cushion.

The pistons 27 and the racks 26 to which they are connected are constantly maintained at their normal positions by suitable coil springs 29 when not actually influenced by the engagement of the pawls 6 and 7 engaging the racks 26.

The counter reactive springs 29 therefore operate as they are intended to do, that is, as counter weights to support the racks and their pistons 27 in their normal positions at the top ends of their cylinders 28, so that full advantage may be derived from the compression of the air or other fluid in said cushioning cylinders 28 to absorb the force of a sudden shock due to a sudden application of a load to said racks 26, as by a breaking of a cable.

The operation of this invention of a safety attachment for elevators I will now proceed to explain.

Suppose the cables 9 and 10, to break or sever by any cause whatever, the pawls 6 and 7 are immediately released and the spring rods 17 and 18, which are operated to move outwardly by their springs 23, as previously explained, cause the pawls 6 and 7 to move outwardly to engage the racks 26 and

thereby apply the entire weight of the elevator car and its mechanism connected to it to said racks 26 which latter immediately descend and force the air cylinder pistons 27 downwardly into their air cylinders 28 to compress the air confined therein and thereby to operate as a yielding cushion to resist the force of the descending car with a minimum amount of jar and the maximum safety.

I claim:—

1. In a safety device for elevators, the combination with the hoisting cables thereof, an elevator car, a pair of depending opposing pawls situated on opposing sides of said car, means connecting said cables and said pawls to retain the latter in normal disengaged position, spring rods connected at their outer ends to said pawls, coil springs surrounding said spring-rods, a thrust block situated between said springs, and a supporting eye-bolt to which said spring thrust block is hingedly connected, of a pair of opposing racks situated in the vertical plane of travel of said pawls, slides wherein said racks are slidably supported, and an air cushioning cylinder situated to receive the thrust of said slidable racks.

2. In a safety device for elevators, the combination with the hoisting cables thereof, an elevator car, a pair of opposing depending pawls situated on opposing sides of said car, opposing bell-crank levers one of the lever arms of each of which is connected to said cables, independent connecting rods connecting each one of said opposing pawls and said bell-crank lever-arms, spring rods connected at their outer ends one to each of said pawls, springs surrounding said rods, a spring thrust block situated between said springs and connected thereto, an eye-bolt to which said spring thrust-block is hingedly connected, and a coil spring inclosing casing secured on said thrust block, of vertically extending rack guides situated adjacent to the sides of the elevator car directly opposite the pawls thereof, racks slidably supported by said rack guides, pistons on the ends of said racks, air cushioning cylinders situated under the bottom ends of said racks wherein said pistons operate to cushion the descent of the car, its contents, and the racks, and counter reactive springs situated within said cushioning cylinders and beneath the pistons thereof.

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

DANIEL K. WALLINGFORD.

Witnesses:

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