No. 846,613. PATENTED MAR. 12, 1907.

C. R. PRATT.

ELEVATOR SAFETY DEVICE.

APPLICATION FILED MAR. 27, 1905.

2 SHEETS—SHEET 1.

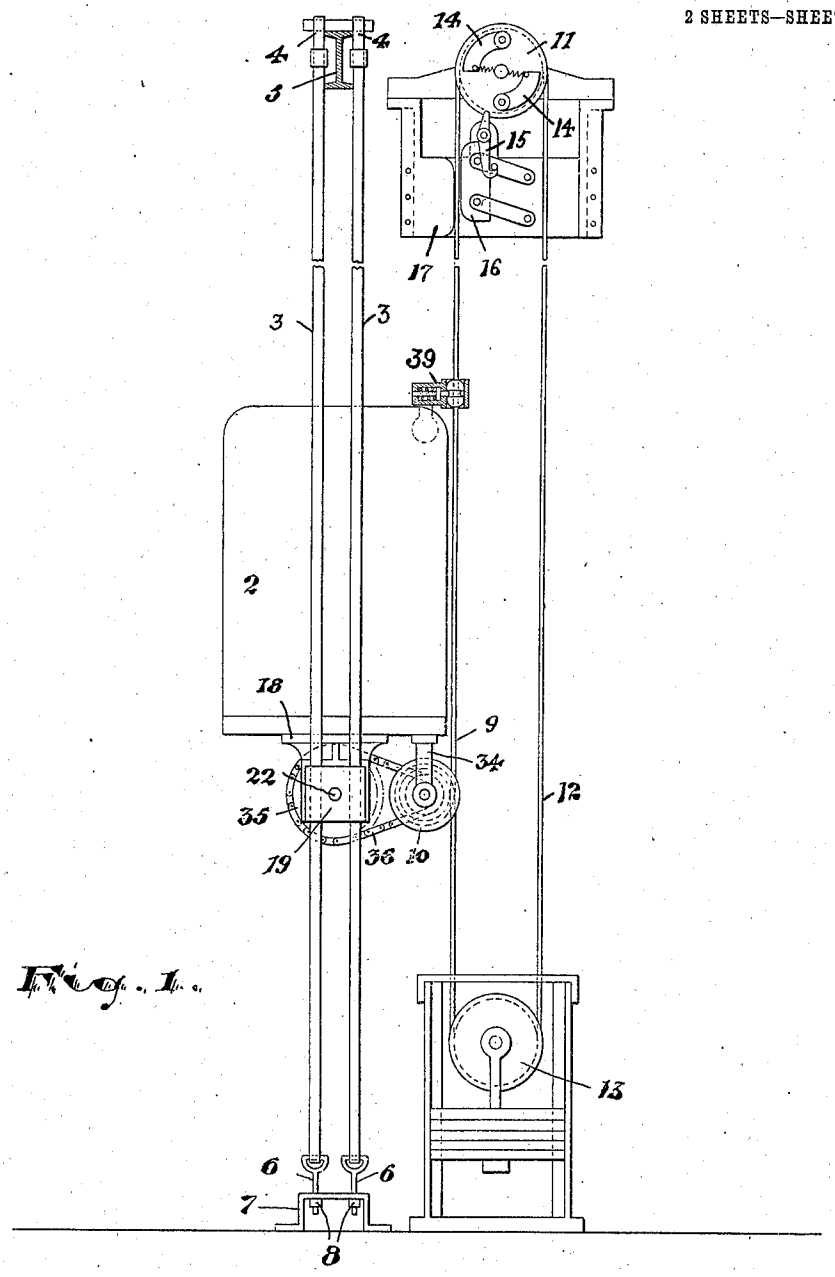



Fig. 1.

WITNESSES

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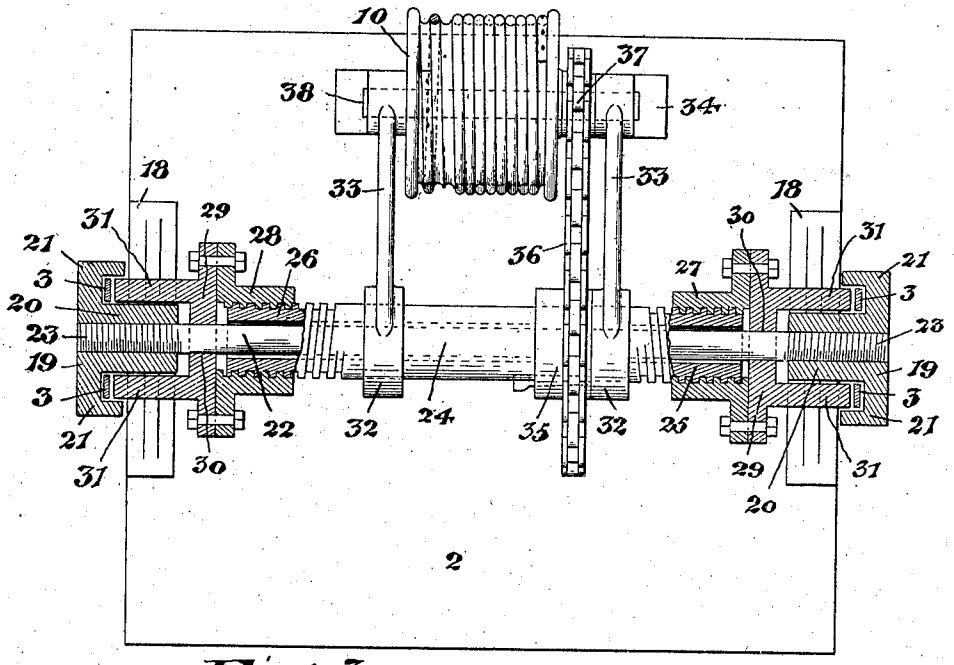



Fig. 3.

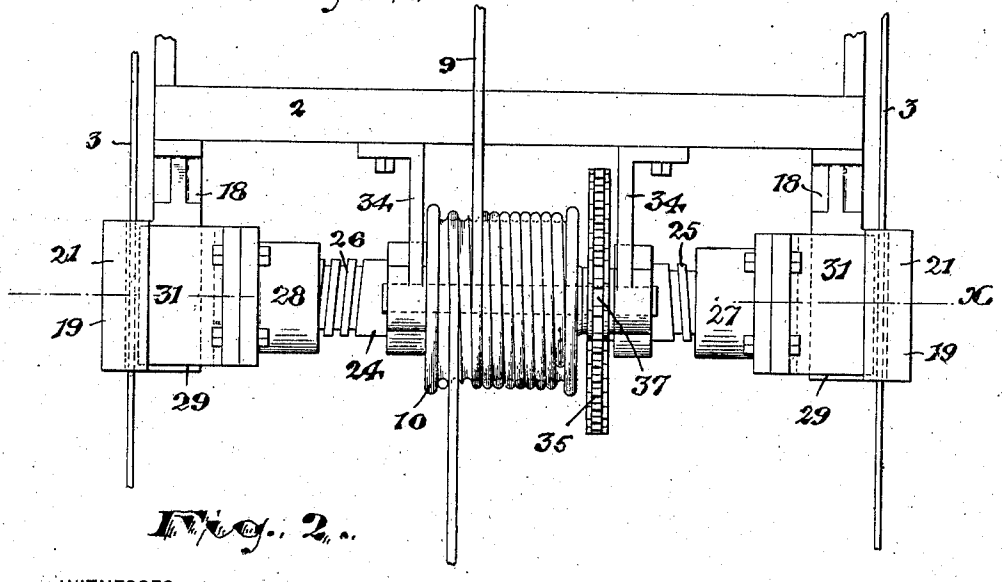



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## ELEVATOR SAFETY DEVICE.

No. 846,613. Specification of Letters Patent. Patented March 12, 1907.

Application filed March 27, 1905. Serial No. 252,150.

*To all whom it may concern:*

Be it known that I, CHARLES R. PRATT, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Elevator Safety Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to elevators, and more particularly to the safety means employed for preventing the elevator from falling to the bottom of the shaft in case the supporting-cables break or other accident happens.

The objects of the invention are to simplify and cheapen the friction-rails which are adapted to be engaged by the gripping means upon the bottom of the car; to provide tension-strips which shall be an efficient substitute for the steel or wood rails, cast-iron racks, &c., which have been used heretofore; to provide improved gripping means for engaging the tension-strips, and to obtain other advantages and results, some of which may be referred to in connection with-the description of the working parts.

The invention consists in the improved safety device for elevators and in the arrangements and combinations of parts of the seam, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a side elevation of an elevator-car and its safety-device attachments complete. Fig. 2 is a rear elevation of the safety-device mechanism at the bottom of the car. Fig. 3 is a view looking upward from beneath the car and showing the said mechanism partly in central longitudinal section as upon line *x* Fig. 2.

In said drawings, 2 indicates an elevator-car of any well-known construction adapted to move vertically between any ordinary guide means (not shown) and to be raised and lowered by any usual means. (Not shown.) At each of the opposite lateral sides of the car is arranged a pair of vertical tension-strips 3 3, which are fastened at their upper ends, as at 4 4, to an I-beam 5 and at their lower ends are held by eye bolts 6 6 in a frame 7 and which bolts have nuts 8, by which said strips 3 can be tightened to the desired tension. Each of said strips 3 is a flat cold-rolled piece of steel possessing great tensile strength and having a hard smooth regular surface. These extend from one end to the other of the hoistway, so that there are neither welds nor joints of any kind and while I have been unable to find such strips already upon the market I am assured that the same can be manufactured. Only the upper and lower extremities of the strips are held by the fastening means above described, and by these fastening means the strips can be brought under any desired tension, so that I have termed them "tension-strips." Obviously there must be sufficient tension to prevent lateral sagging of the strips, so they will not unduly engage the gripping means when idle. At the same time a very considerable tension will not prevent sufficient yielding against pressure of the idle gripping means to obviate undue friction. The said strips are exposed on all sides, except as inclosed by the gripping means, and so are free to move or yield in any lateral direction.

It will be understood that where old-fashioned wood rails are removed from the elevator-shaft in a building already completed and in use it is extremely difficult to insert new rails, because of their length and stiffness. I have therefore provided my improved tension-strips particularly for use in such places, the strip being such that it can be rolled into coils for shipment and brought into the hoistway and then straightened out by the mere act of unwinding, and thus assume its normal extended position for use. Obviously great convenience is secured and ease of handling and shipping and the substitution of other brake means for the old fashioned wood rails is rendered feasible in a great many cases where it could not otherwise be done.

Upon the bottom of the car I arrange means adapted to frictionally grip the said

strips 3 3 in case of accident and bring the car to a gradual stop to prevent its dropping to the bottom of the shaft. These gripping means are, as usual, operated by means of a rope 9, which is anchored at its ends to drum 10 upon the bottom of the car and adapted to wind in opposite directions on said drum, the intermediate or middle portion of the rope extending upward over a governor-sheave 11, downward, as at 12, over an idle tension-sheave 13, and thence back to the drum 10. Under normal conditions a catch 39, shown located upon the top of the car 2, serves to hold the rope 9, so that it turns the sheaves 11 13 idly in their bearings instead of rotating the drum 10. If, however, an accident happens, so that the car starts to drop and the governor-sheave 11 rotates at a speed above the normal, centrifugal weights 14 on said sheave fly outward and trip a latch 15 to release the same and permit a movable jaw 16 to clamp the rope tightly against a coöperating fixed jaw 17. Obviously this stops movement of the intermediate portion of the rope, the said catch 39 slipping upon it, and the drum 10 begins to turn, one end of the rope unwinding therefrom and the other winding upon the drum.

Upon the bottom of the car, adjacent to the opposite lateral sides thereof, are fixed depending brackets 18 18, each of which has at its extremity an outwardly-projecting horizontal jaw 19. Said jaws 19 are each preferably T-shaped in plan, the stem 20 lying between the friction-strips 3 3 and the arms 21 21 being adapted to hook loosely one around each of the said strips 3 3, as shown in Fig. 3. Preferably a rod 22 extends between the lower ends or jaws 19 of the two brackets 18 to brace said brackets, said rod having threaded ends 23, which screw into said jaw-pieces. Upon the said rod 22 is a hollow shaft or sleeve 24, loose from the rod and being oppositely threaded at its extremities—that is, one end 25 having a right-hand thread and the other end 26 having a left-hand thread. Each of the said threaded ends of the hollow shaft 24 enters a correspondingly-threaded socket 27 (or 28) of an inner jaw 29, adapted to coöperate with the outer jaws 19, above described, in gripping the tension-strips 3 3. Each of said jaws 29 has a sliding bearing, as at 30, upon the rod 22 and is provided with outwardly-projecting vertical arms 31 31, which lie on either side of the stem 20 of the T-shaped outer jaw 19 and are adapted at their ends to engage the inner sides of the tension-strips 3 3, lying within the arms 21 of said outer jaw. The said hollow shaft 24 is journaled in bearings 32 at the ends of arms 33, projecting from the brackets 34, which support the drum 10, before described, as shown in Figs. 2 and 3, and obviously upon turning said shaft 24 the movable jaws 29 will be both moved toward or away from the outer fixed jaws 19, according to the direction of turning. To rotate the said hollow shaft 24, a sprocket-wheel 35 is fixed upon the shaft and connected, as by a chain 36, with a driving-sprocket 37, fast upon the same shaft 38 as the drum 10 is fixed upon. The winding of the rope ends upon the drum 10 is then such that when the car drops, as above described, the said drum will be turned in a direction to transmit motion through its shaft 38, sprocket-wheel 37, chain 36, and sprocket 35 to rotate the hollow shaft 24 in a proper direction to force the movable jaws 29 apart from each other into engagement with the tension-strips 3 3. The friction thus produced upon the tension-strips suffices to stop the car, and by means of the gears 35 37 the time of effecting such friction is so regulated that the car is not stopped with undue abruptness.

Obviously my improved friction-strips are much cheaper than steel or wood rails, cast-iron racks, or the like and are much more readily and easily installed. At the same time my improved gripping means enables sure and efficient hold to be had on said strips. Furthermore, because of the flexibility of the friction-strips the clearance of the gripping-jaws need not be so great in order to avoid undue wear.

Having thus described the invention, what I claim as new is—

1. In a safety device for elevators, a flat cold-rolled or drawn tension-strip of metal extending longitudinally of the hoistway from end to end thereof, said strip being flexible and adapted to be coiled or rolled upon itself, means for engaging the extremities of said tension-strip and stretching the same, and gripping means upon the car to engage said strip.

2. In a safety device for elevators, a plurality of cold-rolled or drawn steel tension-strips arranged longitudinally of the hoistway at the sides of the car and being continuous or free from joints or welds from one end of the hoistway to the other, said strips being flexible and adapted to be coiled or wound up for transportation, means supporting said strips by their opposite ends while leaving them freely exposed on all sides and adapted to bring the said strips under tension as desired, and means adapted to be carried by the car to inclose or surround said strips and exert a gripping action thereon.

3. In a safety device for elevators, tension-strips arranged in the hoistway on opposite sides of the car, fixed gripping-jaws mounted on the car and lying outside said tension-strips, a rigid rod extending between said jaws, a hollow shaft mounted on said rod between said fixed jaws, a right-hand threaded nut on one end and a left-hand threaded nut

on the other end of said hollow shaft, movable jaws mounted one on each of said nuts and adapted to be forced outwardly against the said fixed jaws, and means automatically operated by the falling of the car for rotating said hollow shaft.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of March, 1905.

CHARLES R. PRATT.

Witnesses:
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RUSSELL M. EVERETT.