D. EVANGELIST.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED APR. 24, 1920.

1,373,122. **Patented Mar. 29, 1921.**

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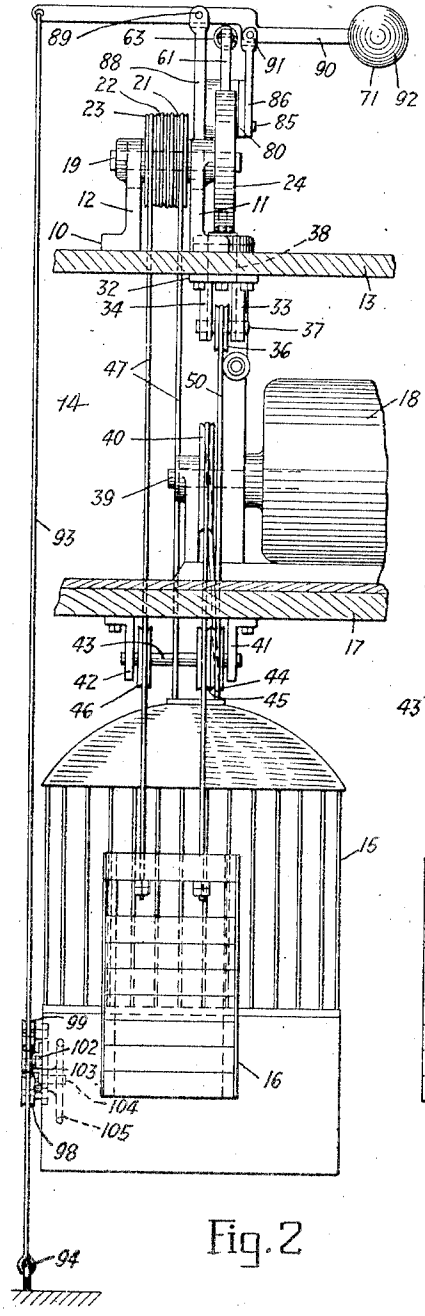


Fig. 2

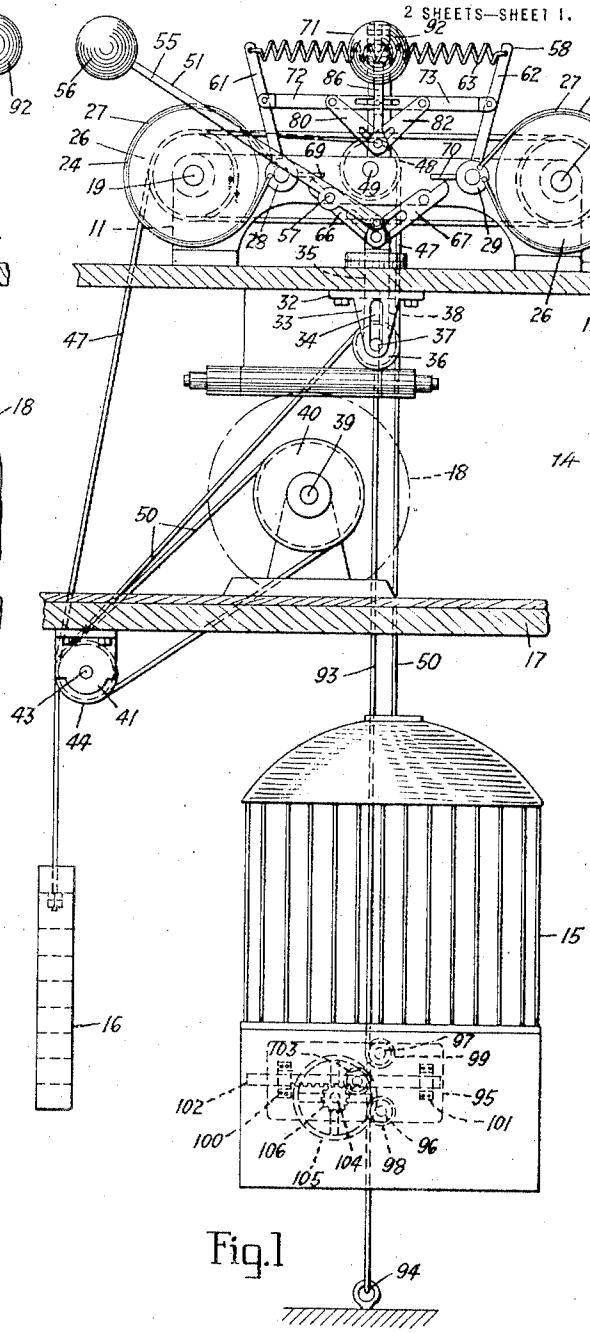


Fig. 1

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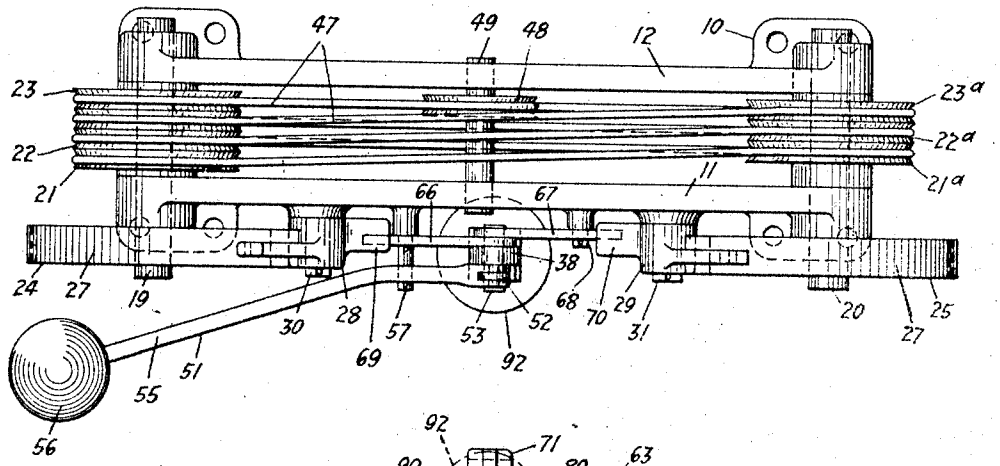
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2 SHEETS—SHEET 2.

Fig. 3



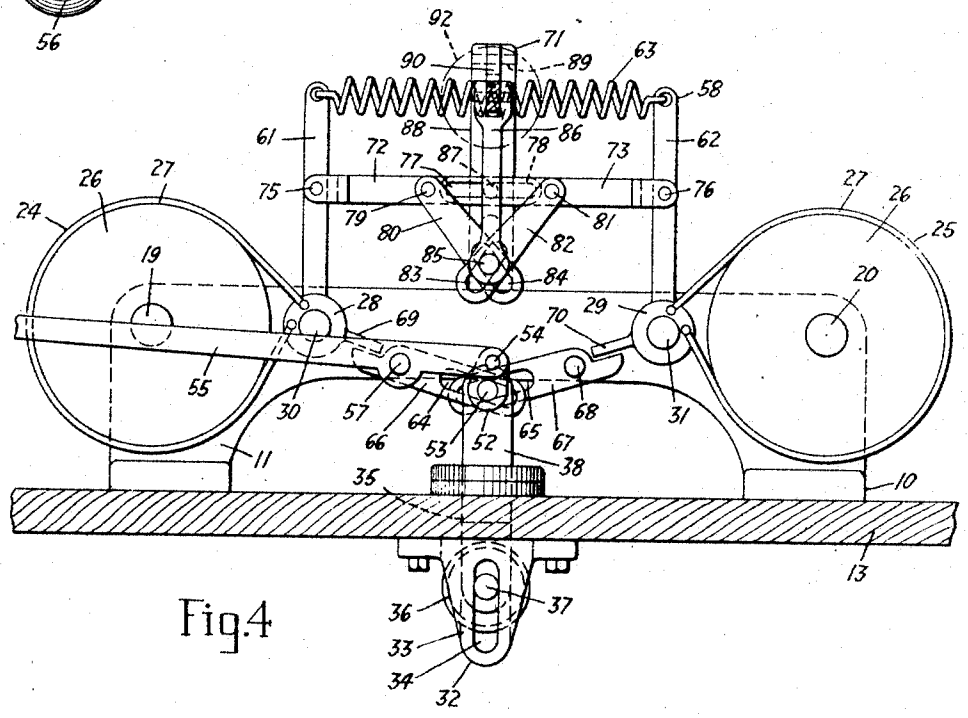


Fig. 4

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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

1,373,122. Specification of Letters Patent. Patented Mar. 29, 1921.

Application filed April 24, 1920. Serial No. 376,268.

To all whom it may concern:

Be it known that I, DOMINICK EVANGELIST, a subject of the King of Italy, and a resident of New York, borough of Bronx, in the county of Bronx and State of New York, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a full, clear, and exact specification.

This invention relates to a class of devices designed to be used in conjunction with elevators.

My invention has for its object primarily to provide a device adapted to be utilized for preventing injury to persons when occupying the elevator car of a building or other structure by causing the car to stop during its travel in event of breaking of the hoisting cable, and which also serves to allow the car to be lowered to an exit so that the occupants may safely depart therefrom should the car stop between landings. The invention consists mainly of arranging a frame within the shaft of an elevator car with which is associated a counterbalancing weight and a motor, and in the frame are journaled two spaced shafts. The shafts are provided with a plurality of pairs of pulleys, one pulley of each pair being held on each of the shafts. Also on the shafts are held two alined friction brakes. Under the frame is mounted a pulley which is adapted to be moved upwardly and downwardly toward and from between the brakes. On the drive shaft of the motor is held a pulley, and in spaced proximity to this pulley is an idler pulley. A cable leads from the car over the movable pulley, over the idler pulley as well as over the pulley on the motor shaft, and the second end of this cable is attached to the counterbalancing weight of the car. Another cable leads from the car over each successive pair of the pulleys on the shafts of the brakes in the manner somewhat of belts, and the other end of the second cable is also fastened to the counterbalancing weight. Associated with the movable pulley is a weight element adapted to automatically move with the breaking of the cable on the movable pulley so that this pulley will be moved upwardly, and on the frame is provided spring actuated mechanism which is operable with the movements of the weight element and the movable pulley for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys.

Another object of the invention is to provide a releasing mechanism which is operable from the interior of the car for releasing the brakes when set to permit the car to be lowered to an exit of the elevator shaft following the stop of the car between landings, in order that persons occupying the car may safely leave the car; and a further object of the invention is to provide a safety device for elevators of a simple, efficient and durable construction which may be made of any suitable material in any desired size.

With these and other objects in view the invention will be hereinafter more fully described with reference to the accompanying drawings forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a fragmentary view, partly in section, showing a front elevation of one form of safety device embodying my invention as employed in conjunction with an elevator car, its operating motor and its counterbalancing weight.

Fig. 2 is a fragmentary view, partly in section, showing a side elevation of the device with the car, motor and counterbalancing weight.

Fig. 3 is an enlarged plan view of parts of the device with the weight actuating mechanism for releasing the brakes removed therefrom, and

Fig. 4 is an enlarged fragmentary view, partly in section, showing a front elevation of the brakes and their operating mechanism when actuated for stopping the elevator car.

The safety device has a frame 10 which may be composed of two side plates 11 and 12 arranged in spaced parallel relation as well as being secured crosswise upon a platform, as 13, which is placed in the upper part of an elevator shaft, as 14, having a car, as 15, for carrying persons and articles from the lower to the upper part and vice versa of a building or other structure, and associated with the car is the usual movable counter weight, as 16, for balancing the car, while on a platform, as 17, provided in the elevator shaft under the platform 13 may be a motor, as 18, of preferably a reversible type adapted to be driven by electricity supplied from any suitable source.

In the ends of the plates 11 and 12 of the frame 10 are journaled two crosswise shafts 19 and 20, and one of the ends of both shafts may protrude beyond the plate 11. On the shafts 19 and 20 between the plates of the frame are pairs of pulleys 21, 21a, 22, 22a, 23, 23a, one pulley of each pair being held on each shaft so that with the rotation of the pulleys the shafts will be revolved. On the protruding ends of the shafts 19 and 20 are two similar friction brakes 24 and 25 adapted to be operated for stopping the travel of the car 15 in emergency, as will be hereinafter more fully explained.

Each of the brakes 24 and 25 has a circular disk 26, and both disks are fixed to the shafts 19 and 20. On the periphery of each disk is a strap 27 which is preferably composed of a strip of flexible metal with a leather lining contacting with the edge of the disk. These straps are somewhat larger than the diameters of the disks so that the ends of the straps protrude slight distances from the edges of the disks as well as being in closely spaced relation, and the ends of the straps of the disks are attached to sleeves, as 28 and 29, which are rotatable upon studs 30 and 31 projecting from spaced parts of the plate 11 of the frame 10 so that with the rotary movement of the sleeves accordingly the straps 27 will be brought into and out of frictional engagement with the disks 24 and 25 for setting and releasing the brakes.

Depending from the underside of the platform 13 centrally between the brakes 24 and 25 is a bracket 32 having two spaced arms 33 and 34 which extend toward the motor 18, and in the arms of this bracket are registered vertically disposed slots 34, while through the platform 13 is an opening 35 leading into the space between the arms 33 and 34 of the bracket. In this bracket between its arms is a pulley 36 having its shaft 37 rotatable as well as slidably arranged in the slots 34 of the arms of the bracket, and to the shaft 37 of the pulley is held the lower end of a plunger or bar 38 which is of a length so that its upper part movably protrudes through the opening 35 of the platform 13 as well as protruding somewhat above the platform. On the drive shaft 39 of the motor 18 is a pulley 40, and on the underside of the platform 17 in spaced proximity to the motor are two spaced brackets, 41 and 42 in which is journaled a shaft 43 carrying two closely arranged pulleys 44, 45 and a third pulley 46.

To the top of the car 15 is attached one end of a cable 47 whicl passes upwardly in the shaft 14 through holes in the platforms 17 and 13 over an idler pulley 48 held on a stud 49 which is journaled in the plates 11 and 12 of the frame 10 centrally between the brakes 24 and 25. From the pulley 48 the cable 47 passes in the fashion of belts successively over the pairs of pulleys 21, 21a, 22, 22a, 23, 23a. The cable then passes over the pulley 46, and the second end of the cable is fastened to the counterbalancing weight 16. Also to the car 15 is held one end of a cable 50 which passes through an opening in the platform 17, over the movable pulley 36, over the pulley 44, over the pulley 40 of the motor 18, over the pulley 45, and the second end of the cable 50 is attached to the counterbalancing weight 16. With the operation of the motor and driving of its pulley 40, for causing the car to travel upwardly in the shaft 14 the weight 16 will move downwardly in the shaft, and the movement of the cables 47 and 50, will rotate the idler pulley 48, pairs of pulleys 21, 21a, 22, 22a, 23, 23a, pulley 46 and pulleys 44, 45. These parts of the device will be reversely operated when the motor is operatively reversed for lowering the car in the shaft.

Should the cable 50 accidentally break the pulley 36 and plunger 38 are moved upwardly by operation of a weight element, as 51. This element consists of a link 52 having one of its ends rotatably held on a pin 53 protruding from the upper end of the plunger 38. To the other end of the link 52 is rotatably held, at 54, one end of a bar 55, and on the other end of the bar is a weight 56 which may be in the form of a ball. The bar 55 intermediate its ends is fulcrumed, at 57, to the plate 11 of the frame 10 of the device, and the ball 56 is of sufficient weight to cause the bar 55 to be swung for moving the plunger 38 and pulley 36 upwardly toward the center of the space between the brakes 24 and 25 in event of breaking of the cable 50.

In order to set the brakes 24 and 25 for stopping the travel of the car as well as checking the movement of the cable 47, a mechanism, as 58, is provided. This mechanism consists of providing on the sleeves 28 and 29 of the straps 27 of the brakes two bars 61 and 62 which protrude upwardly. Between these bars and attached to their upper ends is a spring 63 which normally serves to force the bars toward each other, and this spring is also tensioned for serving to set the brakes 24 and 25 in emergency by causing the straps 27 to frictionally engage the disks 26 when the bars 61 and 62 are swung toward each other by the action of the spring. On the pin 53 of the plunger 38 is slidably and rotatably mounted in crosswise arrangement the slotted ends 64 and 65 of two levers or bars 66 and 67 one having its central part pivotally held on the fulcrum pin 57 of the weight element 51 and the other lever having its central part fulcrumed, at 68, to the plate 11 of the frame 10 of the device. The levers 66 and 67 are arranged so that their second ends are in

closely spaced relation to the sleeves 28 and 29 of the bars 61 and 62 of the mechanism 58, and projecting toward each other from the peripheries of the sleeves 28 and 29 are two lugs or fingers, as 69 and 70, both of which movably rest upon the second ends of the levers 66 and 67. When the safety device, car 15, motor 18, and the cables are in normal working condition the pulley 36, plunger 38, weight element 51 and levers 66, 67 are in positions, as shown in Fig. 1, whereby the pulley and plunger are lowered in the bracket 32 of the platform 13. The weight element 51 is swung upwardly, and the levers 66 and 67 are disposed in somewhat the fashion of a V with their free ends supporting the lugs 69 and 70 so that the sleeves 28 and 29 of the brakes 24 and 25 are rotatably positioned on the studs 30 and 31 of the frame 10 to hold the straps 27 of the brakes out of frictional engagement with the disks 26 of the brakes. The bars 61 and 62 of the mechanism 58 are thereby swung outwardly from each other, and the spring 63 is expanded against its tension. In event of breaking of the cable 50 the weight element 51, plunger 38 and pulley 36 will automatically operate, as above described, and assume the positions, as shown in Fig. 4. The slotted levers 66 and 67 will then be expansibly guided for causing their free ends to be lowered. The tension of the spring 63 will force the upper ends of the bars 61 and 62 toward each other, and in turn the sleeves 28 and 29 of the bars will be partially revolved for setting the brakes 24 and 25 by bringing the straps 27 into frictional action with the disks 26 of the brakes. The movement of the cable 47 will then be checked for causing the travel of the car 15 to stop.

For the purpose of enabling the car to be moved to an exit should the car stop in the elevator shaft between landings so that the occupants may safely leave the car, I provide a releasing mechanism, as 71. The releasing mechanism is preferably composed of two alined bars 72 and 73 having one of their ends pivoted, at 75 and 76, to the central parts of the bars 61 and 62 of the spring actuating mechanism 58 of the brakes so that the second ends of the bars 72 and 73 are in slidable overlapping arrangement centrally between the bars 61 and 62. The overlapping parts of the bars 72 and 73 are slotted respectively, at 77 and 78, and these slots are adapted to register. To the central part of the bar 72 is pivoted, at 79, the upper end of a link 80, and to the central part of the bar 73 is pivoted, at 81, the upper end of a link 82. The links 80 and 82 are disposed downwardly from the slidable slotted bars 72 and 73 and the second ends of these bars are slotted, as at 83 and 84, as well as overlapping each other so that the slots are in crosswise register. Movably extending into the registered slots 83 and 84 of the links 80 and 82 is a pin 85 which protrudes from the lower end of a bar 86 disposed upwardly to the spring 63 of the mechanism 58, and on the central part of the bar 86 is a pin 87 movably disposed in the registered slots 77 and 78 of the bars 72 and 73. Extending upwardly from the central part of the plate 11 of the frame 10 is a stationary upright or bar 88 which may be of a length so that its upper end extends slightly above the upper end of the bar 86, and to the upper end of the upright 88 is fulcrumed, at 89, the central part of a lever or bar 90. The lever 90 is disposed crosswise with respect to the spring 63 of the mechanism 58, so that its front end protrudes some distance in front of the spring 63, while its other end protrudes some distance rearwardly of the spring. The central part of the front portion of the lever 90 is pivoted, at 91, to the upper end of the bar 86, and on the front end of the lever is a weight 92 which may be in the form of a ball. To the other end of the lever 90 is fastened the upper end of a cable 93 extending downwardly in the elevator shaft in proximity to one of the walls of the car 15, and the lower end of the cable 93 is fastened, at 94, to the bottom of the elevator shaft so that the cable will be held taut. On the inner face of the wall of the car adjacent to the cable 93 may be provided a plate 95, and projecting from this plate through holes in the car contiguous to the cable 93 are two spaced pins 96 and 97 which are arranged in vertical alinement. Rotatable on the pins 96 and 97 are two vertically alined pulleys 98 and 99 which are in spaced relation as well as being arranged so that the cable is movably disposed in their peripheral grooves. On the exterior of the wall of the car and held to the plate 95 are two spaced straps 100 and 101 disposed in transverse alinement between the pulleys 98 and 99, and movable back and forth in these straps crosswise of the cable and between the pulleys is a rack or toothed bar 102. On a stud protruding from the rack toward the pulleys 98 and 99 is a revoluble pulley 103 adapted to be moved by the movement of the rack into and out of engagement with the part of the cable opposite to and between the pulleys 98 and 99 so that the cable will be clamped between the three pulleys as well as being released when the rack is moved accordingly. Projecting through an opening in the wall of the car and journaled in the plate 95 is a stud 104, and on the part of this stud within the car is a hand wheel 105 whereby the stud may be manually revolved, and on the stud exteriorly of the car is a toothed wheel 106 meshing with the rack 102. When the spring actuated mechanism 58 is held out of action, as above described, the bars 72 and 73 with

the links 80 and 82 of the releasing mechanism are in the expanded positions shown in Fig. 1, and when the mechanism 58 is operating to check the travel of the car the bars 72, 73 and links 80, 82 are in the contracted positions shown in Fig. 3. The releasing mechanism 71 is then coacting with the mechanism 58 to hold the car against movement, and to allow the car to be lowered to an exit of the elevator shaft the releasing mechanism 71 is operated by the operator of the car by turning the wheel 105 so that the toothed wheel 106 will move the rack 102 for causing the pulley 103 to be moved in a direction between the pulleys 98 and 99. The cable 93 will then be clamped between the three pulleys.

The pull on the cable which is brought about by the turning of the hand wheel 105, causing the pulley 103 to move out from between the pulleys 98 and 99, thereby making a bight in the cable 93, which action shortens the effective length of this cable. The lever 90 will then raise and release the brake mechanism, after which the car will be lowered by its own weight so that the occupants may depart from the car.

In the foregoing description, I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle or sacrificing any of the advantages of this invention, therefore, I reserve to myself the right to make such changes as fairly fall within the scope.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, two spaced shafts journaled in the frame, pairs of pulleys, one pulley of each pair being on each of the shafts, two alined friction brakes on the shafts, a pulley on the drive shaft of the motor, a cable leading from the car over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counter-balancing weight, and spring actuated mechanism operable with the breaking of the cable on the pulley of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys.

2. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, two spaced shafts journaled in the frame, pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, a pulley on the drive shaft of the motor, a cable leading from the car over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable on the pulley of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys, and a weight element associated with the cable on the motor pulley normally serving to hold actuated mechanism from operating and the weight element automatically movable with the breaking of the cable on the motor pulley so that the spring actuated mechanism may operate.

3. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, two spaced shafts journaled in the frame, pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, a pulley on the drive shaft of the motor, a cable leading from the car over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable on the pulley of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

4. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, two spaced shafts journaled in the frame, pairs of pulleys, one pulley of each pair being held on each of

the shafts, two alined friction brakes on the shafts, a pulley on the drive shaft of the motor, a cable leading from the car over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said named cable being also fastened to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable on the pulley of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys, a weight element associated with the cable on the motor pulley normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of the cable on the motor pulley so that the spring actuated mechanism may operate, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

5. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counterbalancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the car to the counterbalancing weight and said second named cable being driven by the motor, and spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable of the brakes.

6. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counterbalancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the car to the counterbalancing weight and said second named cable being driven by the motor, spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable of the brakes, and a weight element associated with the cable of the motor normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of the cable of the motor so that the spring actuated mechanism may operate.

7. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counter balancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the car to the counterbalancing weight and said second named cable being driven by the motor, spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable of the brakes, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

8. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counterbalancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the car to the counterbalancing weight and said second named cable being driven by the motor, spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable of the brakes, a weight element associated with the cable of the motor normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of the cable of the motor so that the spring actuated mechanism may operate, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

9. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counterbalancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the

car to the counterbalancing weight and said second named cable being driven by the motor, spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable of the brakes, and a lever with a weight coacting with the spring actuated mechanism for releasably holding the car, and means operable from within the car to release at intervals the action of the lever upon the spring actuated mechanism to allow the spring actuated mechanism to operate for freeing the brakes whereby the car may be lowered by its weight.

10. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of friction brakes mounted above the motor, a cable leading from the car to the counterbalancing weight and the movement of the cable being under the control of the action of the brakes, a second cable also leading from the car to the counterbalancing weight and said second named cable being driven by the motor, spring actuated mechanism operable with the breaking of the cable of the motor for causing the travel of the car to stop by operating the friction brakes and checking the cable of the brakes, a weight element associated with the cable of the motor normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of the cable of the motor so that the spring actuated mechanism may operate, a lever with a weight coacting with the spring actuated mechanism for releasably holding the car and means operable from within the car to release at intervals the action of the lever upon the spring actuated mechanism to allow the spring actuated mechanism to operate for freeing the brakes whereby the car may be lowered by its weight.

11. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, a shaft journaled in the frame, pulleys held on the shaft, a friction brake on the shaft, a cable driven by the motor leading from the car to the counterbalancing weight, a second cable leading from the car over the pulleys of the shaft of the brake to the counterbalancing weight, and spring actuated mechanism operable with the breaking of the cable driven by the motor for causing the travel of the car to stop by operating the friction brake and checking the movement of the cable on the pulleys of the shaft of the brake.

12. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, a shaft journaled in the frame, pulleys held on the shaft, a friction brake on the shaft a cable driven by the motor leading from the car to the counterbalancing weight, a second cable leading from the car over the pulleys of the shafts of the brake to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable driven by the motor for causing the travel of the car to stop by operating the friction brake and checking the movement of the cable on the pulleys of the shaft of the brake, and a weight element associated with the cable driven by the motor normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of the motor cable so that the spring actuated mechanism may operate.

13. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, of a frame mounted above the motor, a shaft journaled in the frame, pulleys held on the shaft, a friction brake on the shaft, a cable driven by the motor leading from the car to the counterbalancing weight, a second cable leading from the car over the pulleys of the shafts of the brake to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable driven by the motor for causing the travel of the car to stop by operating the friction brake and checking the movement of the cable on the pulleys of the shaft of the brake, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brake whereby the car may be lowered by its weight.

14. In a safety device for elevators, the combination with a car, a motor, and a weight counterbalancing the car, a frame mounted above the motor, a shaft journaled in the frame, pulleys held on the shaft, a friction brake on the shaft, a cable driven by the motor leading from the car to the counterbalancing weight, a second cable leading from the car over the pulleys of the shafts of the brake to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable driven by the motor for causing the travel of the car to stop by operating the friction brake and checking the movement of the cable on the pulleys of the shaft of the brake, a weight element associated with the cable driven by the motor normally serving to hold said spring actuated mechanism from operating and the weight element being automatically movable with the breaking of

the motor cable so that the spring actuated mechanism may operate, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brake whereby the car may be lowered by its weight.

15. In a safety device for elevators, the combination with a car adapted to be raised and lowered in a shaft by the operation of a motor supported in the upper part of shaft and a weight counterbalancing the car as well as being adapted to be raised and lowered in the shaft with the raising and lowering of the car, of a frame mounted in the shaft above the motor, two spaced shafts journaled in the frame, a plurality of pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, an upwardly and downwardly movable pulley under and between the brakes, a pulley on the drive shaft of the motor, an idler pulley in spaced proximity to the pulley on the motor shaft, a cable leading from the car over the movable pulley, over the idler pulley, over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, and spring actuated mechanism operable with the breaking of the cable on the movable pulley for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys.

16. In a safety device for elevators, the combination with a car adapted to be raised and lowered in a shaft by the operation of a motor supported in the upper part of shaft and a weight counterbalancing the car as well as being adapted to be raised and lowered in the shaft with the raising and lowering of the car, of a frame mounted in the shaft above the motor, two spaced shafts journaled in the frame, a plurality of pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, an upwardly and downwardly movable pulley under and between the brakes, a pulley on the drive shaft of the motor, an idler pulley in spaced proximity to the pulley on the motor shaft, a cable leading from the car over the movable pulley, over the idler pulley, over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, a weight element associated with the movable pulley, adapted to automatically move with breaking of the cable over the pulley for causing the pulley to move upwardly, and spring actuated mechanism operable with the operation of the weight for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys.

17. In a safety device for elevators, the combination with a car adapted to be raised and lowered in a shaft by the operation of a motor supported in the upper part of shaft, and a weight counterbalancing the car as well as being adapted to be raised and lowered in the shaft with the raising and lowering of the car, of a frame mounted in the shaft above the motor, two spaced shafts journaled in the frame, a plurality of pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, an upwardly and downwardly movable pulley under and between the brakes, a pulley on the drive shaft of the motor, an idler pulley in spaced proximity to the pulley on the motor shaft, a cable leading from the car over the movable pulley, over the idler pulley, over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, spring actuated mechanism operable with the breaking of the cable on the movable pulley for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

18. In a safety device for elevators, the combination with a car adapted to be raised and lowered in a shaft by the operation of a motor supported in the upper part of shaft, and a weight counterbalancing the car as well as being adapted to be raised and lowered in the shaft with the raising and lowering of the car, of a frame mounted in the shaft above the motor, two spaced shafts journaled in the frame, a plurality of pairs of pulleys, one pulley of each pair being held on each of the shafts, two alined friction brakes on the shafts, an upwardly and downwardly movable pulley under and be-

tween the brakes, a pulley on the drive shaft of the motor, an idler pulley in spaced proximity to the pulley on the motor shaft, a cable leading from the car over the movable pulley, over the idler pulley, over the pulley on the motor shaft and having its second end attached to the counterbalancing weight, a second cable leading from the car over each successive pair of the pulleys of the shafts of the brakes in the fashion of belts and the second end of said second named cable being also fastened to the counterbalancing weight, a weight element associated with the movable pulley, adapted to automatically move with breaking of the cable over the pulley for causing the pulley to move upwardly, spring actuated mechanism operable with the operation of the weight for causing the travel of the car to stop by operating the friction brakes and checking the movement of the cable on the pairs of pulleys, and releasing mechanism coacting with the spring actuated mechanism for releasably holding the car and said releasing mechanism being operable from within the car to release at intervals the stop action of the spring actuated mechanism for freeing the brakes whereby the car may be lowered by its weight.

This specification signed and witnessed this 23" day of April A. D. 1920.

DOMINICK EVANGELIST.

Witnesses:
M. SORENSON,
J. FREDERICK CRYER.