

J. LEOPOLD.
ELEVATOR SAFETY DEVICE.
APPLICATION FILED MAR. 2, 1911.

998,357.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

Fig. 1

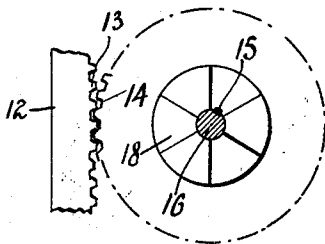
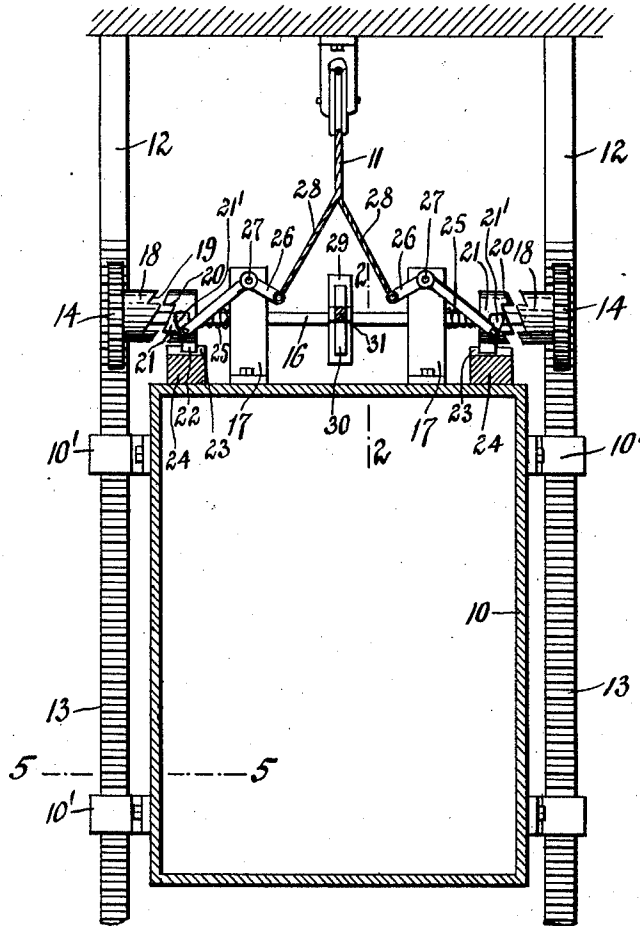


Fig. 3

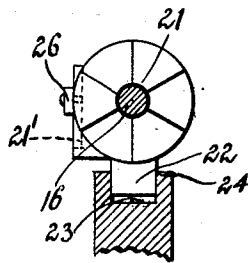


Fig. 4

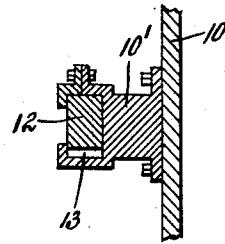


Fig. 5

WITNESSES

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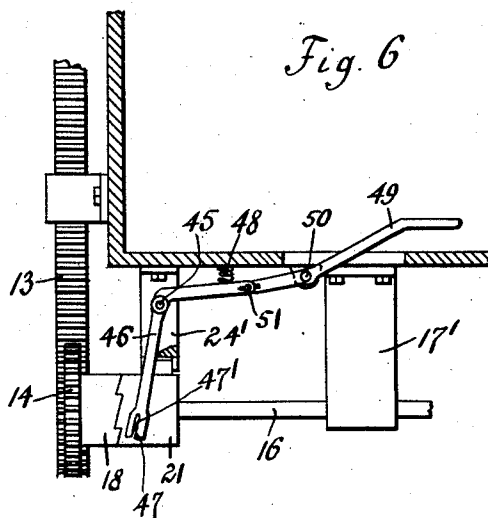
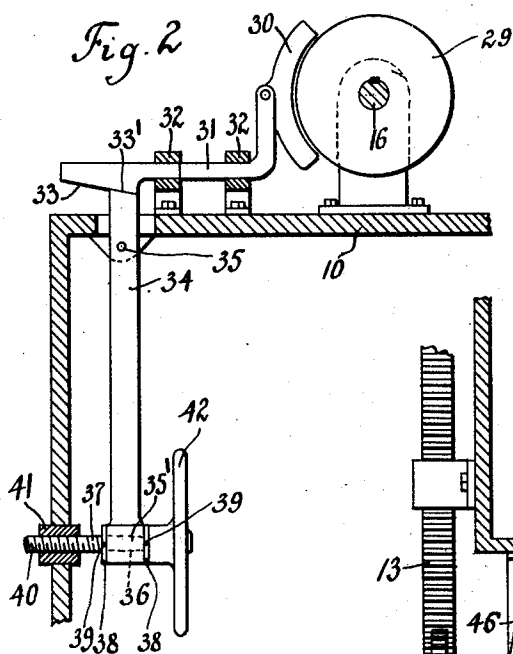
Joseph Leopold INVENTOR
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JOSEPH LEOPOLD, OF SOUTH BETHLEHEM, PENNSYLVANIA.

ELEVATOR SAFETY DEVICE.

998,357.

Specification of Letters Patent.

Patented July 18, 1911.

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To all whom it may concern:

Be it known that I, JOSEPH LEOPOLD, a subject of the King of Hungary, and resident of South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

The present invention relates to elevators, and has for its object to provide new and novel safety devices for elevators, whereby the elevator car is held in position should the hoisting rope or other hoisting means break or give way.

Another object of the invention is to provide a device of this character which will come into action promptly before the car can acquire much momentum.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter fully described, pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

A few of the many possible embodiments of the invention are illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of an elevator containing the invention, with the car in section and other parts broken away; Fig. 2 is a section taken on line 2—2 of Fig. 1; Figs. 3 and 4 are side elevations of details of construction; Fig. 5 is a section taken on line 5—5 of Fig. 1; Fig. 6 is a front elevation of a modified detail of construction.

Referring now more particularly to Figs. 1 to 5, inclusive, the numeral 10 indicates an elevator car, suspended by a hoisting rope 11 in a shaft. The lower end of the rope 11 is fastened to the operating drum in the well known manner, while the upper end of the same is attached to the elevator car in a manner hereinafter to be described. Uprights 12, 12 extend up the opposite sides of the shaft. To the car are fastened brackets 10', 10' in engagement with the uprights 12 for guiding the up and down movements of the car. Racks 13, 13 are attached to or

made integral with said uprights. With these racks mesh gears 14, 14, fastened, preferably by means of keys 15 to a shaft 16, which latter is rotatably journaled in bearings 17, 17, carried by the top of the car 10. To the gears 14, 14 are secured in any suitable manner disks 18, 18, provided with a plurality of radial recesses 19, 19, which are adapted to engage teeth or claws 20, 20 of blocks 21, 21, which are shiftably arranged upon the shaft 16. To prevent the rotation of the blocks 21, 21 with the shaft 16, the said blocks are provided with downwardly extending projections 22, fitting into grooves 23, 23 in the stationary standards 24, 24, which are attached to the top of the elevator car. Springs 25, 25 bear against the bearings 17, 17 and the blocks 21, 21, and tend to force the teeth 20 into engagement with the recesses 19 of the disks 18. Bell-crank levers 26, 26 are pivoted to the bearing blocks 17 at 27, and engage the recesses 21', 21' in their respective blocks 21, 21 with one of their ends, while their free ends are fastened to the divided strands 28, 28 of the upper end of the hoisting rope or cable 11.

It will be observed that the safety mechanism herein described may be arranged upon the underside of the elevator car just as well.

The brake mechanism of the elevator car comprises a brake drum 29, keyed or otherwise attached to the shaft 16. Upon this drum acts the brake shoe 30, which is rigidly attached to a bar 31, which latter is guided in its movement by standards 32, 32 attached to the top of the elevator car. The free end of this bar is tapered, as shown at 33, and contacts with the tapered end 33' of an actuating lever 34, which is pivoted at 35 to the car. The lower end 35' of this lever is provided with a hole 36, into which fits a spindle 37. The relative movement between the lower end of the lever and the spindle in the direction of the longitudinal axis of said spindle is prevented by means of the disks 38, 38, which are attached, for instance by means of cotter pins 39, 39, to the spindle, and bear against both sides of the lower end of the lever. The spindle is screw threaded, as shown at 40, and meshes with a stationary nut 41. A hand-wheel 42 is attached to the free end of the spindle, and facilitates the rotation of the latter.

The operation of the device is as follows: Normally, when the car is running up and

down, the shaft 16 will rotate and so also the gears 14, 14 attached thereto, since the teeth 20 of the blocks 21 are kept out of engagement by the weight of the car with the
 5 recesses 19 in the disks 18. The springs 25, 25 will, under these normal conditions, be compressed. As soon as, however, the rope 11 breaks or gives way, the springs 25, 25 will be free to act and force the blocks 21
 10 toward the disks 18 and thereby the teeth of the blocks into engagement with the recesses of the disks, arresting thereby the rotation of the gears 14, 14 and thus stopping the car. The stopping of the car will take
 15 place almost immediately, since the gears 14, 14 will turn, after the parting of the hoisting rope, only a fraction of a revolution, that is until their recesses register with the teeth of the blocks 21, 21.

20 The speed of the car can be governed by the mechanism shown in Fig. 2 of the drawings. In turning the hand-wheel 42 so as to bring the same nearer to the stationary nut 41, its tapered end 33' will act upon the
 25 bar 31 and force thereby the brake shoe 30 into contact with the brake drum 29. The greater the friction caused between the brake shoe and the brake drum, the slower will be the rotation of the shaft 16 and thus the
 30 movement of the elevator car 10.

A modification of the device is illustrated in Fig. 6 of the drawings, in which case the shaft 16 is journaled in bearings 17', attached to the underside of the bottom of the
 35 car. A gear 14, with its disk 18, is attached in the same manner to the shaft 16 as those shown in Figs. 1 and 3 of the drawings, and meshes with the rack 13 for the same purpose. The block 21 is prevented from rotary movement by a standard 24', also attached to the bottom of the car. To the
 40 standard 24' is pivoted at 45 a lever 46, which has a slotted end 47 in engagement with a pin 47' upon the block 21. A spring 48, bearing against the bottom of the car and the lever 46, tends to force the teeth of the block 21 into engagement with the recesses of the disk 18. A foot lever 49 is
 45 pivoted at 50 to the car and connected by means of a pin 51 to the lever 46. The operation of this device is as follows: The spring 48 forces the teeth of the sliding block 21 into engagement with the recesses of the disk 18, that is normally the gear 14 cannot rotate. In starting the car, the operator will press the free end of the foot
 50 lever downward and disengage thus the disk from the block 21, whereby the car can be moved up and down the shaft. In arresting
 55 the movement of the car, first the unwinding of the hoisting rope or cable is arrested,

and then the foot taken off the lever 49. If the hoisting rope breaks or gives way, the operator simply allows the free end of the foot lever 49 to rise, whereby the spring 48
 65 will force the block 21 into engagement with the disk 18 and thereby arrest the rotation of the gear 14, which will thus stop the movement of the car.

What I claim is:—

1. In an elevator, the combination with an elevator shaft, of vertical racks attached to two sides thereof, an elevator car traveling in said shaft, a shaft rotatably mounted upon said car, gears attached to said rotatable shaft meshing with said racks and provided with a plurality of recesses, blocks shiftably arranged upon said shaft having teeth adapted to engage the recesses of said gears and being held against rotation, levers
 75 pivoted to said car and to said blocks, and a hoisting rope attached to said levers, substantially as and for the purpose specified.

2. In an elevator, the combination with an elevator shaft, of vertical racks attached to two sides thereof, an elevator car traveling in said shaft, a shaft rotatably mounted upon said car, gears attached to said rotatable shaft meshing with said racks and provided with a plurality of recesses, blocks
 85 shiftably arranged upon said shaft having teeth adapted to engage the recesses of said gears and being held against rotation, levers pivoted to said car and to said blocks, a hoisting rope attached to said levers, a
 90 brake drum fixedly attached to said rotatable shaft, and a brake shoe adapted to act upon said drum and to be operated by the car operator for controlling the speed of said rotatable shaft.

3. In an elevator, the combination with an elevator shaft, of a vertical rack attached to the side thereof, an elevator car traveling in said shaft, a shaft rotatably mounted upon said car, a gear attached to said rotatable shaft meshing with said rack and provided with a plurality of recesses, a block shiftably arranged upon said shaft having teeth adapted to engage the recesses of said gear and being held against rotation, a lever
 105 pivoted to said car and to said block, and means acting upon said lever for holding the teeth of said block normally disengaged from the recesses of said gear, substantially as and for the purpose specified.

Signed at South Bethlehem, in the county of Northampton and State of Pennsylvania, February 18, A. D. 1911.

JOSEPH LEOPOLD.

Witnesses:

D. B. CSCUTERICZ,
 SIMON DCZSO.