A. L. CRESCI.

SAFETY DEVICE FOR DOORS.

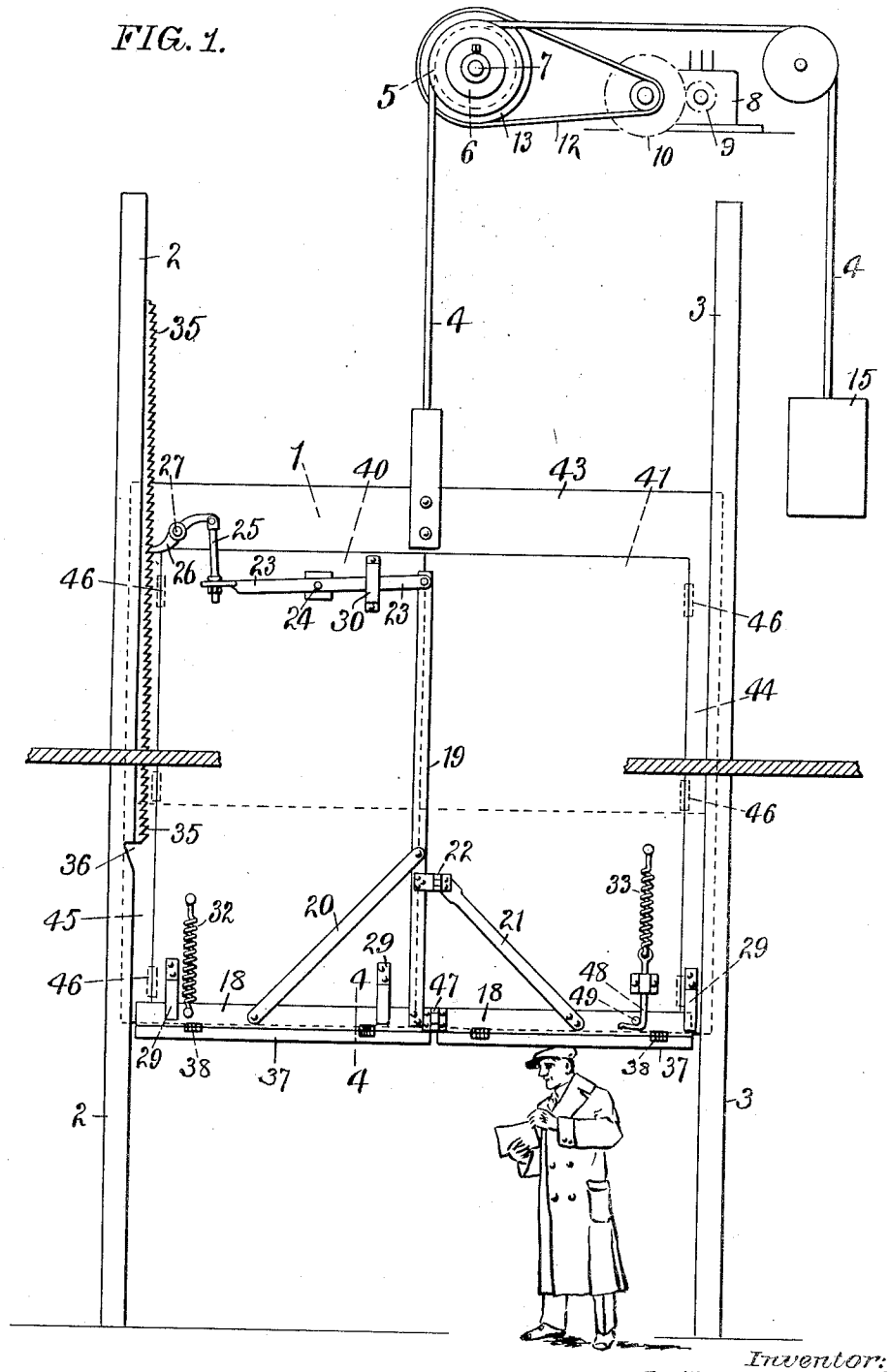
APPLICATION FILED DEC. 18, 1918.

1,356,192.

Patented Oct. 19, 1920.

2 SHEETS—SHEET 1.

FIG. 1.



Inventor:
Anthony L. Cresci
By his Attorney
F. DeWitt Goodwin

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2.

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2 SHEETS—SHEET 2.

FIG. 2.

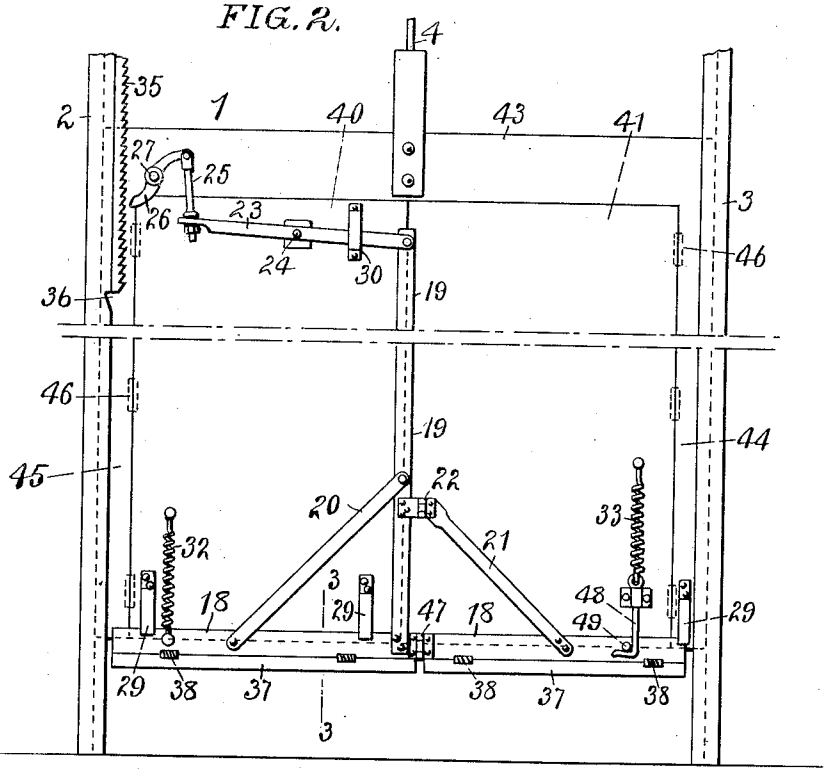


FIG. 7.

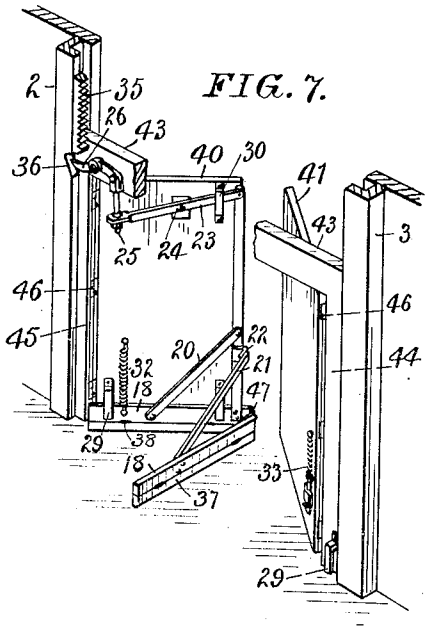


FIG. 3.

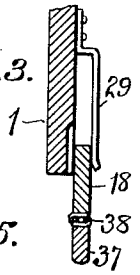


FIG. 4.

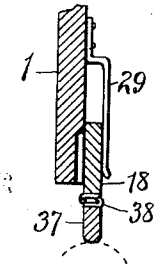


FIG. 5.

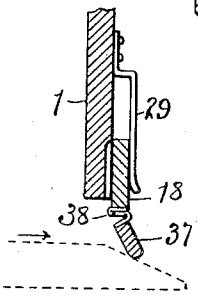
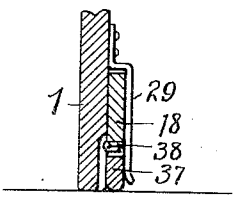


FIG. 6.



Inventor:
Anthony L. Cresci
By his Attorney
F. DeWitt Goodwin

UNITED STATES PATENT OFFICE.

ANTHONY L. CRESCI, OF VINELAND, NEW JERSEY.

SAFETY DEVICE FOR DOORS.

1,356,192. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed December 18, 1918. Serial No. 267,254.

To all whom it may concern:

Be it known that I, ANTHONY L. CRESCI, a citizen of the United States, residing at Vineland, in the county of Cumberland and State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Doors, of which the following is a specification.

My invention relates to improvements in a safety device for doors and particularly relates to a device for stopping the downward movement of sliding doors, elevators, or dumb waiters, when they strike an object or an obstruction in their path.

The object of my invention is to provide a door or the like with a cross-bar or guard member, movably mounted upon the bottom of the door, the said guard member projecting beyond the bottom edge of the door and having operatively connected thereto a pawl adapted to engage the door frame or wall and thus lock the door when the guard bar strikes anything which may stop its movement; a further object of my invention is to provide the guard bar with a hinged member which will yield when it strikes a moving object, such as the top of an automobile passing under the door and providing spring hinges on said hinged member having sufficient resiliency to cause the guard bar to move in relation to the door and operate the locking pawl to keep the door from descending; a still further object of my invention is to operate the door by a cable or chain driven by a friction clutch which will move the door only when it is properly counter-balanced and said clutch will slip when the door is held by the safety device, thereby preventing the cable from becoming slack or the counter-balance weight from being lifted; and a still further object of my invention is to provide the sliding door with outwardly swinging doors to be used in case of fire and to arrange the locking mechanism thereon in such a manner that the swinging doors can be opened.

Referring to the accompanying drawings: Figure 1, is a view in elevation of a door and the guides, or door frame, in which the door slides, showing my invention embodied therein and showing the parts in a position to hold the door from descending; Fig. 2, is a partial view similar to Fig. 1, showing the door with the safety mechanism in the unlocked position, in which the door is free to move; Fig. 3, is an enlarged section on line 3—3 Fig. 2; Fig. 4, is a similar section on line 4—4 Fig. 1 showing the parts in a position to lock the door; Fig. 5, is a section similar to Fig. 3, showing the position which the hinged strip assumes when the door comes down on a moving object; Fig. 6, is a view similar to Fig. 5, showing the position which the parts assume when the door is resting upon the floor, and Fig. 7, is a perspective view of the sliding door and the emergency swinging doors carried thereon, the latter being shown partially open.

In the accompanying drawings, in which like reference characters refer to like parts, 1 represents the door slidably mounted in the vertical guide rails 2 and 3. The door 1 is lifted by a cable or chain 4, which is driven by a sheave 5 forming one member of a friction clutch 6, secured on the driven shaft 7, which latter may be rotated in either direction by the electric motor 8, through the gear-wheels 9 and 10, the belt 12 and the pulley 13 secured on shaft 7. The opposite end of the cable 4 is provided with a counter-balance weight 15 which is nearly equal to the weight of the door, and the members 5 and 6 forming the friction clutch are adjusted so that the friction between them will only be sufficient to move the door when properly counter-balanced. The electric motor is controlled by suitable switches, not shown on the drawings.

Upon the bottom of the door is a movable bar, or guard member 18. Said bar 18 is connected with and carried by a vertical bar 19. Braces 20 and 21 are provided to connect the bars 18 and 19 together with sufficient rigidity that when pressure is applied to the outer ends of the bar 18 the motion will be communicated to the vertical bar 19.

The upper end of the vertical bar 19 is pivotally connected with an arm 23, pivoted upon the pin 24, secured to the door 1. The arm 23 is pivotally connected with a rod 25 which in turn is connected with a pawl 26, pivoted on a pin 27 secured to the door. The free end of the pawl 26 is normally held in the position shown in Fig. 2 by the weight of the parts 18 and 19, but it may be thrown into engagement with the vertical frame 2 and thus prevent the door from descending, when the guard member 18 meets with an obstruction.

The guide bar 18 is held against the door

by the guide plates 29 and it is supported by the stop plate 30 engaging the pivoted arm 23, so that the normal position of the guard bar 18, when the door is off the floor, is such that the greater part of the width of the guard bar extends below the bottom of the door 1, as shown in Figs. 2 and 3. Springs 32 and 33 are provided to take nearly all the weight of the guard bar 18 and its adjuncts and thus allow the guard bar 18 to be moved up, in relation to the door, by a very slight force.

When the door is descending and the guard member 18 strikes an object or comes down on the head of a person standing in the door-way, the guard member will be stopped and the door will continue to descend until the guard bar 18 and the connecting members have shifted the pawl 26 into the position shown in Fig. 1, in which position the pawl has engaged the teeth of the rack 35, on the door frame or guide 2.

Said pawl 26 takes the weight of the door and stops the movement of the door before it has moved downwardly the width of the guard bar 18 and therefore the bottom of the door will not strike, or rest upon the obstruction which is beneath the guard bar, as shown in Figs. 1 and 4. In an actual test of this invention it has been demonstrated that the door can be stopped by a person standing under it without the person experiencing any shock or injury.

To prevent the guard bar 18 from being torn away from the door in case the door descends upon a moving object, such as the top of an automobile, I provide a hinged strip 37, which is secured to the lower edge of the guard bar 18 by double spring-hinges 38 which allow the hinged strip 37 to swing in either direction. The said spring hinges 38 have sufficient strength in their springs to move the guard bar 18, in relation to the bottom of the door, when the hinged strip 37 is turned into the position, shown in Fig. 5, and thus stop the downward movement of the door by throwing the pawl 26 into a position to hold the door.

When the door is in its lowest position the guard bar 18 and the hinged strip 37 assume the position shown in Fig. 6, so that the bottom of the door can rest upon the floor. When in this position the pawl 26 swings below the end of the rack 35 and the guide rail 2 is provided with a recess 36 (see Fig. 7) to permit the free end of the pawl 26 to have the additional movement when the door is in its lowest position.

The sliding door 1, may be constructed with outwardly swinging doors 40 and 41 to meet the requirements of building regulations for fire and other emergencies and my safety device may be applied to a door so constructed. The sliding door 1 is constructed with a top cross piece 43 and stiles 44 and 45 secured thereto which run in the guides 2 and 3. Said stiles 44 and 45 have the swinging doors 40 and 41 hinged thereto by the hinges 46. The guard bar 18 is made in two pieces and connected by a hinge 47, to permit the guide bar to be folded into the position shown in Fig. 7. The hinged strip 37 is also made in two sections and the brace 21 is secured to the vertical bar 19 by a hinge 22, and the spring 33 is detachably secured to the bar 18 by a hook 48 engaging a pin 49 on said bar 18. Thus it will be seen that a vertically sliding door provided with swinging doors may be equipped with my improved safety device.

Having thus described my invention I claim and desire to secure by Letters Patent:

1. In a vertically sliding door, a top cross-piece, side stiles secured thereto, a guide frame in which the stiles are slidably mounted, a swinging door interposed between the stiles and extending to the lower ends thereof to form a free passageway between the stiles, a guard strip mounted upon the swinging door and normally projecting below the bottom of the swinging door, and means controlled by the movement of the said guard strip in relation to the swinging door for locking the sliding door in relation to the said guide frame.

2. In a vertical sliding door, a top cross-piece, side stiles secured to said cross-piece, swinging doors hinged to the said stiles adapted to swing horizontally and form a free passageway between the stiles, a guard strip normally extending below the bottom of the swinging doors, said guard strip made in two pieces joined together adjacent to the meeting place between the two swinging doors, and means controlled by the movement of the said guard strip for locking the sliding door in relation to a stationary object.

3. In a vertically sliding door, a top cross-piece, side stiles secured to said cross-piece, swinging doors hinged to the said stiles adapted to swing horizontally, a guard strip normally extending below the bottom of the swinging doors, a pawl pivotally mounted upon the cross-piece, a vertical bar attached to said guard strip, a lever pivotally mounted upon one of said swinging doors, and said lever being pivotally connected with the said vertical bar and with said pawl whereby a movement of the guard strip in relation to the sliding door will throw the pawl into engagement with a stationary object and hold the sliding door from descending.

4. In a vertically sliding door, a top cross-piece, side stiles secured to the cross-piece, swinging doors hinged to the said stiles adapted to swing horizontally, a guard strip normally extending below the bottom of the swinging doors, said guard strip made in

two sections hinged together adjacent to the meeting place of the swinging doors, a vertical bar rigidly attached to one section of the guard strip, a brace attached to the opposite section of the guard strip, said brace hinged to the said vertical bar, a cleat to hold one section of the guard strip adjacent to one swinging door, means for detachably holding the opposite section of the guard strip to the other swinging door, a locking device operatively connected with the said vertical bar, and a frame in which the stiles are slidably mounted adapted to be engaged by the pawl when the guard strip meets an obstruction and thereby hold the door from descending.

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

ANTHONY L. CRESCI.

Witnesses:

BENJAMIN STEVENS,

FRANK W. E. LEICO.