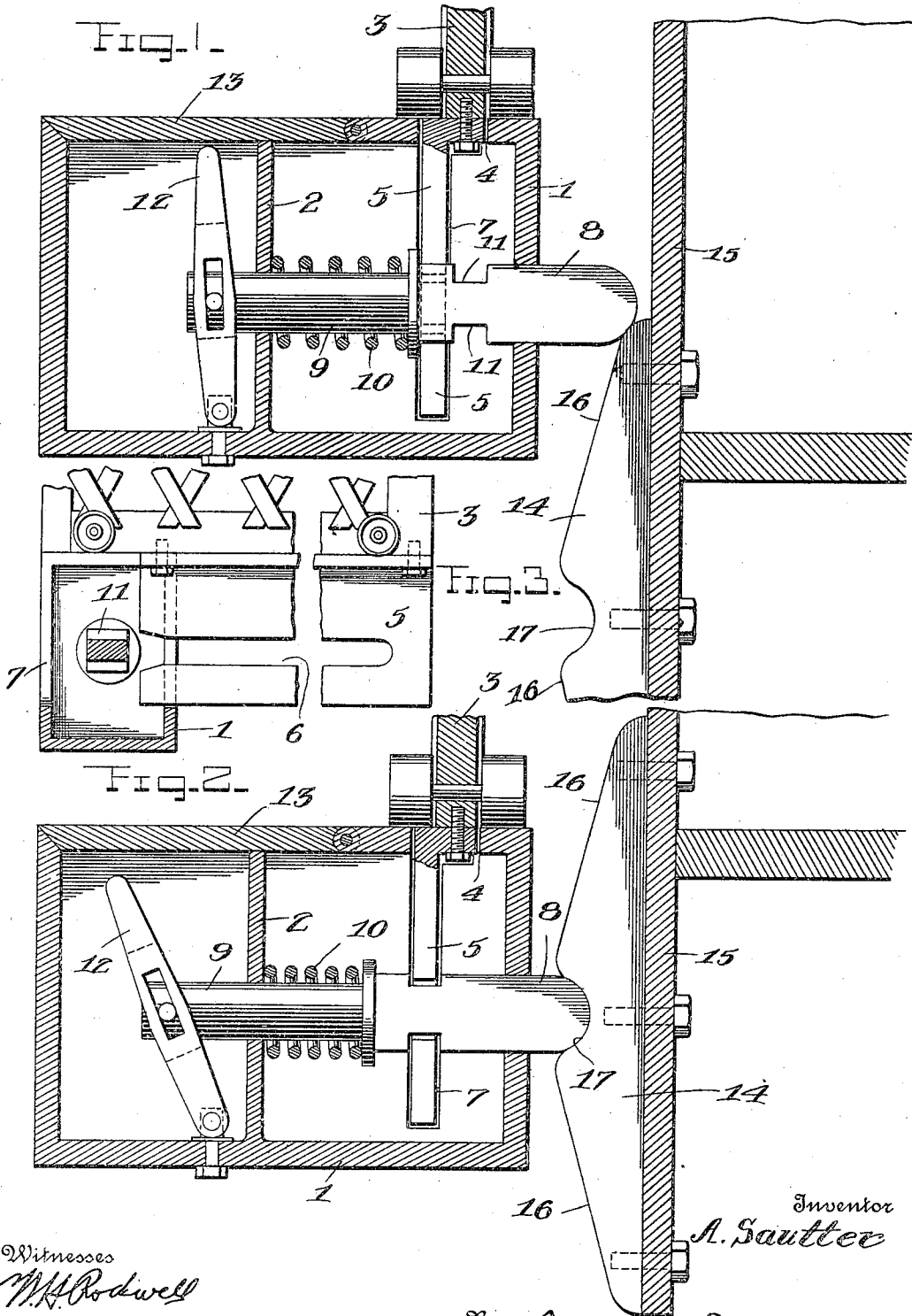


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ELEVATOR.

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ELEVATOR.

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To all whom it may concern:

Be it known that I, ADRIEN SAUTTER, a citizen of the United States, residing at Clearwater, in the county of Sedgwick and State of Kansas, have invented new and useful Improvements in Elevators, of which the following is a specification.

This invention relates to improvements in elevators and more particularly to a safety device for locking the elevator cage during the opening and closing of the door leading into the elevator shaft.

The object of this invention is to provide a means for positively locking the door to the elevator shaft at all times except when the floor of the elevator cage is upon a level with the floor of the building.

A further object of this invention is to positively secure the elevator cage in position during the opening and closing of the door leading into the elevator shaft.

The advantages of such a construction are obvious, for while the elevator cage is passing up and down the shaft all of the doors are locked against movement and thus preventing accidents. Furthermore when the elevator cage is upon a level with the floor of the building the door is automatically unlocked and upon the opening of the same, the cage is automatically locked, secured, and prevented from moving in either direction as long as the door remains open. Upon the closing of the door again the cage is free and may move in either direction, and the movement of the cage will again automatically lock the door.

This invention may be readily applied to elevator construction in use at the present time, the only requirements being that the door leading into the elevator shaft be of the usual sliding type. The automatic locking and unlocking device or mechanism is of simple construction with few parts to get out of order. When desired access may be had to the door locking mechanism so that in the case of an emergency the shaft door may be unlocked.

While the preferred form of this invention is illustrated in the accompanying sheet of drawing, yet it is to be understood that minor detail changes may be made without departing from the scope thereof.

Figure 1 is a vertical section showing the

elevator cage, door leading into elevator shaft and safety mechanism illustrating the position of these parts as the elevator cage approaches or recedes from the floor level of the building. Fig. 2 is a view similar to Fig. 1, but showing the floor of the elevator cage upon the level of the floor of the building and the position of the operating mechanism under these conditions. Fig. 3 is a front elevation of the lower portion of the door leading into the elevator shaft and showing in section the safety mechanism in the position occupied when the door is closed.

The automatic locking mechanism is inclosed in a casing 1 provided with a transverse partition 2 and is located beneath the rear side of the shaft door 3 with the top of the casing upon a level with the floor of the building. That portion of the floor traveled by the shaft door in opening and closing is provided with an elongated slot 4 through which passes a door locking member. This member is a plate 5 secured to the bottom of the door 3 and is provided with an elongated slot 6 extending nearly the entire length thereof and through that edge of the plate nearest the automatic locking mechanism.

The casing 1 of the automatic locking mechanism is provided with an aperture 7 at each side thereof for the passage of the door locking plate 5. The automatic locking mechanism comprises a spring pressed plunger 8 passing through the partition 2 in the casing and extending through the outer wall thereof into the elevator shaft. That portion of the plunger 9 surrounded by the spring 10 is of reduced diameter so that the engagement of the spring with the larger portion will normally retain the plunger in the extended position. The enlarged portion of the plunger is provided with correspondingly cut away portions 11 on the upper and under sides thereof as shown in Figs. 1 and 3. The rear of the plunger has a sliding connection with a pivoted emergency lever 12. The upper portion of the casing upon the floor level is provided with a pivoted door 13 by which access may be had to the emergency operating lever 12. The enlarged portion of the plunger between the upper and lower grooves 11 and

the reduced portion 9 is normally in line with the door locking plate when the plunger is in the extended position. The elongated slot 6 in the door locking plate is of just sufficient width to pass over the grooved portion 11 of the plunger when in line therewith. Since the automatic locking mechanism is located at the rear of the door locking plate 5 any attempt to open the door while the plunger is in the extended position will cause the locking plate to engage the enlarged portion of the plunger, and thereby prevent further movement.

The automatic releasing mechanism comprises a cam or engaging device 14 carried by the elevator cage 15. This device comprises a member provided with a double incline 16 having a recess 17 in the center thereof. This member is secured to the elevator cage in such a position that it will engage the spring pressed plunger 8 causing the same to be retracted each time the elevator passes the same. This member is secured in such a position that when the recess 17 is engaged by the plunger 8 the floor of the building and the floor of the elevator cage will be on the same level. The depth of the recessed portion 17 is such that when the same is in engagement with the plunger 8 the grooved portion 11 upon the top and bottom of the plunger will be in line with the door locking plate 5.

The operation of this device is as follows. When the shaft door is closed the plunger will be in its outward position with the free end extending into the elevator shaft and the enlarged portion in line with the slot in the door locking plate thus preventing any movement of the door. As the elevator cage approaches the engaging member carried thereby will come in contact with the free end of the plunger and as the plunger rides up the incline surface it will be forced inward to its full extent until the pressure of the spring forces the piston into the recessed portion in the center of the engaging member. When the plunger is in this position and only in this position the grooved portion thereof will be in line with the slot in the door locking plate thereby allowing the door to be opened. As soon as the door is opened the locking plate will engage in the grooves of the plunger and thereby prevent any movement in either direction of the same. As long as the door is opened the plunger will be held in engagement in the recessed portion of the engaging member carried by the elevator cage and thereby locking the cage in this position. As soon as the door is again closed the locking plate passes out of engagement with the plunger, and when the elevator cage moves in either direction the plunger is free to be forced out of the recessed portion and will ride down

upon the incline portion of the engaging member. The elevator cage is free to move up and down at all times, but it is impossible to open the shaft door except when the elevator cage is in the proper position, and only in this position will the elevator cage be locked by the plunger.

Should an emergency arise so that it is necessary to open the shaft door without having the elevator cage on a level with the floor thereof, the door in the top of the locking mechanism case is lifted, and the emergency operating lever drawn back until the grooved portion of the plunger is in line with the slot in the door locking plate so that the door may be opened. As soon as the door is opened the lever may be released and the casing door dropped because the shaft door will be automatically locked when the same has been again closed.

What I claim is:—

1. In a device of the character described, a door locking member carried by the shaft door, a cage locking member carried by the cage, means normally engaging the door locking member when the door is closed, said means freeing the door by the operation of the cage locking member.

2. In a device of the character described, a locking member upon the elevator cage, a locking member upon the door, a locking bolt upon the floor of the building adapted to engage both of said locking members, and means to automatically engage the locking bolt upon the floor in engagement with the locking member of the cage operated by the opening of the shaft door.

3. In a device of the character described, a locking member upon the elevator cage, a door locking plate upon the shaft door, a plunger normally extending in the path of the cage member and door locking plate adapted to automatically free the door by engagement with the cage member.

4. In a device of the character described, a locking member on the cage, a door locking plate upon the shaft door, a locking plunger normally extending in the path of the cage member and door locking plate adapted to be retracted by the cage member to free the shaft door and held secured in engagement with the cage member by the opening of the door.

5. In a device of the character described, a door locking plate carried by the shaft door, a reciprocable bolt upon the landing floor normally in the path of movement of the door locking plate and locking the door, means upon the cage to automatically retract the bolt to free the door, said bolt provided with means whereby in the retracted position of the bolt the cage is locked while the door is open.

6. In a device of the character described,

a door locking plate provided with a slot carried upon the shaft door, a recessed locking member carried upon the cage, a reciprocatable locking bolt of greater diameter and normally in line with the slot in the locking plate, said bolt having a cut-away portion adapted to receive the edges of the slot in the door locking plate, and means upon the locking member to reciprocate the bolt to engage the recess in the locking member on the cage and align the cut-away portion of the bolt with the door locking plate.

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Witnesses:

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