

(No Model.)

J. COOPER.
ELEVATOR SAFETY DEVICE.

No. 590,257.

Patented Sept. 21, 1897.

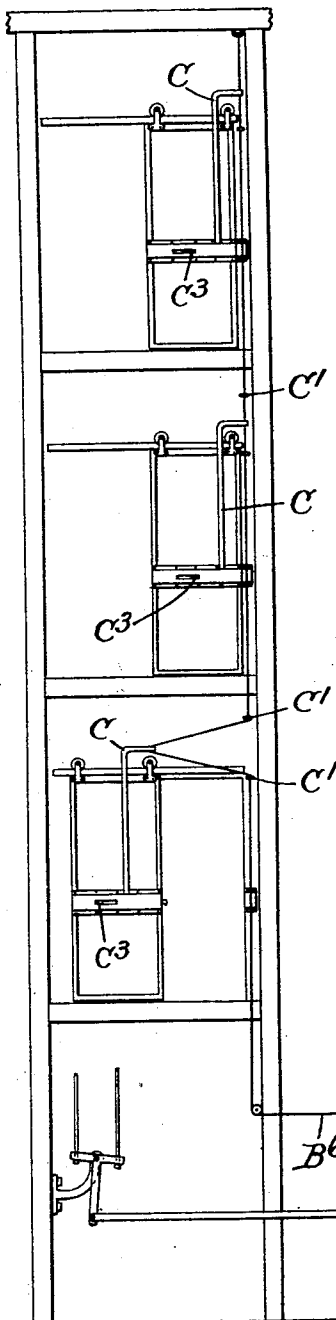


Fig. 1.

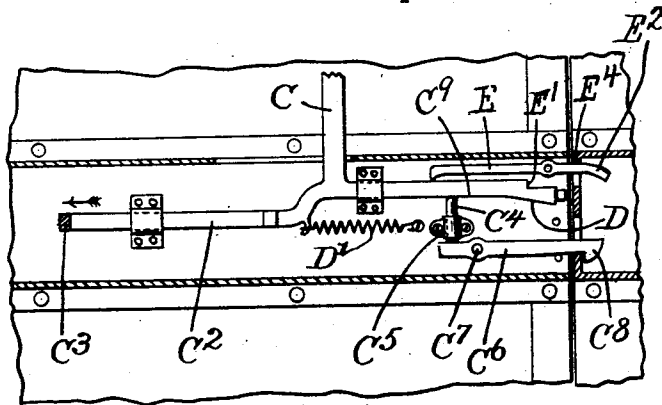


Fig. 2.

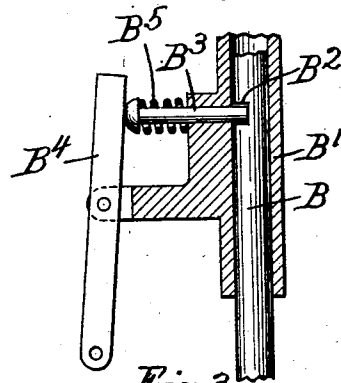


Fig. 3.

Witnesses.

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JAMES COOPER, OF CHICAGO, ILLINOIS.

ELEVATOR SAFETY DEVICE.

SPECIFICATION forming part of Letters Patent No. 590,257, dated September 21, 1897.

Application filed December 21, 1896. Serial No. 616,450. (No model.)

To all whom it may concern:

Be it known that I, JAMES COOPER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

My invention relates to safety devices for elevators, and has for its object to provide an improved safety device, of which the following is a description, reference being had to the accompanying drawings.

Figure 1 is a view, partly diagrammatic, of an elevator system provided with a safety device embodying my invention. Fig. 2 is an enlarged detail of the controlling device associated with the door of the elevator. Fig. 3 is a detail view of the locking device which locks the motor.

Like letters refer to like parts throughout the several figures.

In operating elevators—such, for example, as passenger-elevators—it is very desirable to have a safety mechanism associated with the elevators which prevents the elevator-car from being started while the door is open, thereby preventing any possible injury to passengers by leaving the elevator-car while such elevator-car is in motion. My invention has for its object the production of such a safety device, and the mechanism is so constructed that the motor mechanism for the elevator is locked against motion before the door becomes unlocked, thereby making it impossible to open the door before the mechanism is locked. I prefer to have the safety device operated by means of the same mechanism used to operate the doors.

The drawing herewith presented, in which I have illustrated my invention, is in a great measure diagrammatic and is simply shown in order to illustrate an operative mechanism embodying my invention, it being of course evident that the different parts herein shown may be and in all probability will be very greatly changed in the practical construction and operation of the elevator.

As illustrated in the drawings, I have applied a safety device to a hydraulic elevator controlled by means of the valve-rod A, said valve-rod being operatively connected in any desired manner to a controlling device situ-

ated on the elevator-car. I have not shown such controlling device, as many different kinds of such controlling devices are well known to those versed in the art and as such controlling device is no part of my invention. Connected in any desirable manner with the valve-rod A is a rod B, which may be part thereof, as shown. The rod B reciprocates in a sleeve B', supported in any desirable manner and is provided with a notch or cut-away part B². A pin B³ works in an opening in the sleeve B' and is adapted when inwardly pressed to enter the notch B² and prevent the rod B, and hence the valve-rod A, from being moved. The notch B² is so situated that the pin B³ can only enter it when the valve is closed, so as to prevent the motor mechanism from being operated. It will therefore be seen that these parts constitute a locking device wherein the two parts are free to move with relation to each other when the driving mechanism is in motion, but which are adapted to be locked together when the driving mechanism is at rest.

The pin B³ engages the lever B⁴ and is normally outwardly pressed by means of the spring B⁵, so as to be normally disengaged from the rod B. The lever B⁴ is connected to a cord or other power-transmitting device B⁶, which extends along the elevator-shaft and which is adapted to be connected with the different doors at the different floors. As illustrated in the drawings, this cord is connected with an arm C associated with each door and passes through suitable guides C', as shown, so as not to be pulled out of position when the door is opened. The arm C is connected with the sliding piece C², attached to the door. This sliding piece works in suitable guides, so that it can be reciprocated, and is preferably provided with a projection or the like C³, by which it can be easily manipulated by the elevator-boy. The sliding piece C² engages a pin C⁴, loosely positioned in a guide C⁵, so as to be free to reciprocate therein, said pin engaging the latch C⁶, pivoted at C⁷ and provided with the end C⁸, which engages the holding device at the side of the elevator-shaft, thereby locking the door. The part which engages the pin C⁴ is straight for a short distance, as at C⁹, so that said sliding piece may be moved without in

any manner moving the latch C⁶. Said sliding piece is, however, beveled near the end, as at D, so that a further movement of the sliding piece moves the pin C⁴ downwardly and raises the latch, so as to release the door and allow it to be opened. A spring D' normally tends to pull the sliding piece C² to its normal position—that is, to the position shown in Fig. 2. A pawl E is pivoted in proximity to the sliding piece C², the end of said latch adapted to engage the notch E' in the sliding piece when said sliding piece has been moved so as to open the door, thereby holding it in such position. The end E² of the pawl is curved or beveled, as shown, and is adapted to be lifted when it engages the part E⁴, thereby releasing the sliding piece and latch. Since the pin B³, associated with the valve, can only move a short distance, some construction must be used which will allow a large movement of the door, while the pin moves a short distance. I have shown one means of accomplishing this by interposing a coil-spring F between the door and the pin, said spring allowing the door to be moved after the pin has entered the notch B².

I have shown my device as applied to a hydraulic elevator; but it is of course evident that it may be used in connection with elevators run by any kind of a motor, the moving element by which the motor is controlled being provided with a locking device connected with the elevator-door.

The use and operation of my invention are as follows:

When the elevator-doors are closed, the motor which drives the elevator can be operated at will. If now the elevator-car is stopped and it is desired to open the door, the elevator-boy grasps the sliding piece C² and moves it in the direction of the arrow. The first movement of this sliding piece causes a pull on the cord B⁶, thereby moving the lever B⁴ and forcing the pin B³ inwardly. Said pin engages the notch B² in the rod B, thereby preventing the elevator mechanism from being started. As the sliding piece C² is given a further movement the beveled surface D, coming in contact with the pin C⁴, moves said pin downwardly, thereby moving the end C⁸ of the latch C⁶ upwardly, so as to release the door. The pawl E at the same time engages the notch in said sliding piece and holds it in position so that the pin B³ will not be removed from the notch B² and the rod B. The door is now opened by the pull of the elevator-boy and the passengers may enter or alight in safety, as it is impossible for the elevator-boy to start the motor mechanism. When it is desired to close the door, said door is moved toward its closed position, the motor mechanism being locked during this movement, and when the end E² of the pawl E engages the part E⁴ the pawl is disengaged from the sliding piece C² and said sliding piece moves to its normal position, causing the door to become locked. It

will therefore be seen that by means of my mechanism the motor mechanism which drives the elevator is locked in an inoperative position before the elevator-door begins to open—that is, before the elevator-door is unlocked—and is held in such inoperative position during the period the door is open and until the door becomes again locked.

I have used the term "latch" in the specification and claims, but I mean by "latch" any engaging device which holds the door closed.

I claim—

1. The combination with the motor mechanism of an elevator of a locking device adapted to lock said motor mechanism in an inoperative position, a connection between said locking device and the elevator-doors on the several floors, said connection being such that the locking device is operated before the door becomes unlocked.

2. The combination with an elevator mechanism of a safety device comprising a locking device associated with the motor mechanism of the elevator, and adapted to lock such mechanism in an inoperative position, a movable part associated with the elevator-door and adapted to control the door-latch, a connection between said movable part on the door and said locking device, said movable part connected with said door-latch in such a manner that it is free to move a short distance before operating said latch thereby operating said locking device before unlocking the door.

3. The combination with the driving mechanism of an elevator of a moving element by which said driving mechanism is controlled, a locking device for said moving element comprising two parts free to move with relation to each other, at all times when the driving mechanism is in motion, but which are adapted to be locked together when the driving mechanism is at rest, a movable part associated with the elevator-door and adapted to control the door-latch, said movable part connected with said locking device so as to operate the same when moved, a connection between said movable part and the door-latch, said connection being such that said movable part is free to move a predetermined distance before the latch is operated, such movement operating such locking device and locking the driving mechanism in an inoperative position before the door is unlocked.

4. The combination with a driving mechanism of an elevator of a moving element by which said driving mechanism is controlled, a locking device for said moving element, a movable part associated with the elevator-door and adapted to control the door-latch, said movable part connected with said locking device so as to operate the same when moved, a latch pivoted to said elevator-door and adapted to normally engage a holding device at the side of the elevator-shaft, a pin interposed between said latch and said mov-

able part and adapted to engage a surface on said movable part, said surface being beveled a portion of its length so that said movable part may be moved for a predetermined distance before the beveled surface engages said pin.

5. The combination with a driving mechanism of an elevator of a movable element by which said driving mechanism is controlled, a locking device for said movable element, a movable part associated with the elevator-door and adapted to control the door-latch, said movable part connected with said locking device so as to operate the same when moved, a latch pivoted to said elevator-door and adapted to normally engage a holding

device at the side of the elevator-shaft, a pin interposed between said latch and said movable part and adapted to engage a surface on said movable part, said surface beveled a portion of its length, so that said movable part may be moved for a predetermined distance before the beveled surface engages said pin, whereby the said movable element is locked before the elevator-door is unlocked, and a holding device associated with said movable part on the door and adapted to hold it in its retracted position while the door is open.

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Witnesses:

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