(No Model.)

H. H. DAY.

SAFETY DEVICE FOR ELEVATORS.

No. 493,759. Patented Mar. 21, 1893.

Fig. 1.

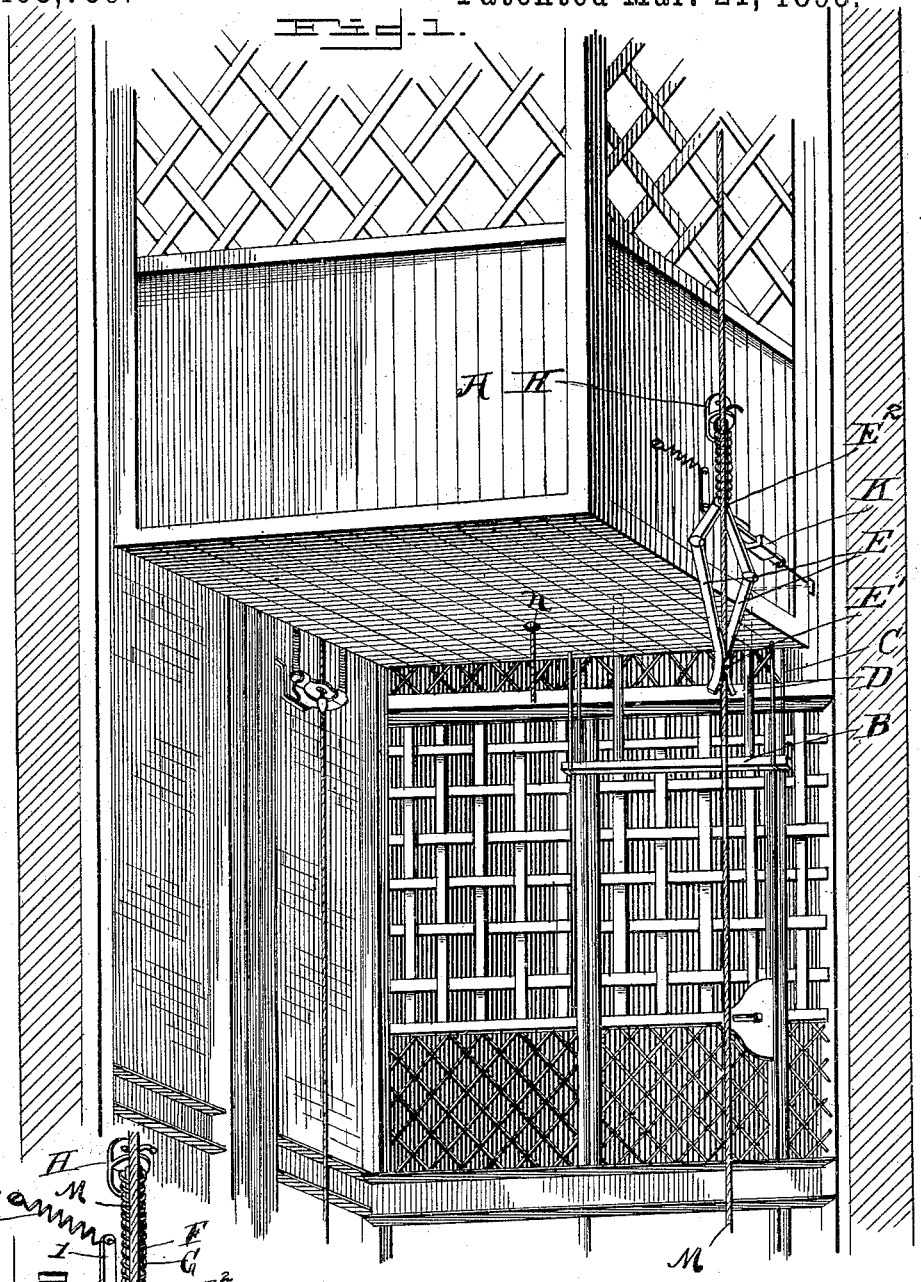
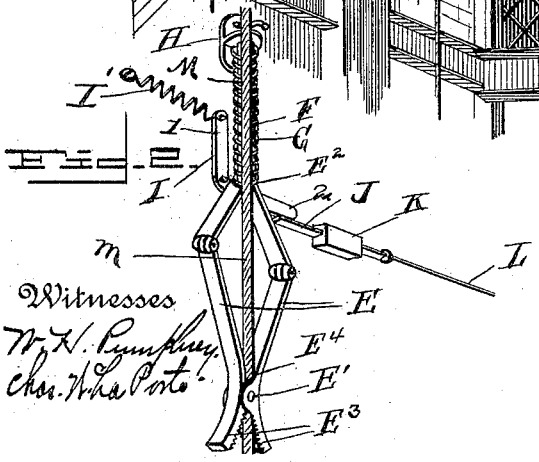


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY HALE DAY, OF NEWTON, MASSACHUSETTS.

SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 493,759, dated March 21, 1893.

Application filed November 1, 1892. Serial No. 450,682. (No model.)

To all whom it may concern:

Be it known that I, HENRY HALE DAY, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Safety Devices for Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to means, operating in connection with elevators, for automatically and instantaneously stopping the descent of an elevator car as it approaches either of the floors through which the elevator shaft extends, whenever any portion of a person, or any article, in the door way of any floor, projects beyond the edge of the door way, so as to contact with the elevator car.

The object of my invention is to provide a safety device for elevator cars which is simple in construction, inexpensive to manufacture, and which may readily be attached to any elevator car.

A further object of my invention is to provide a safety elevator device which is less complicated and less apt to become inoperative or to get out of repair than safety devices heretofore used.

To these ends the invention consists in the construction and arrangement of parts hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like letters and figures designate corresponding parts in the several views: Figure 1 is a perspective view, taken from the rear of the elevator shaft, parts being broken away to show the elevator car descending with the depending frame and the spring clutch device attached to the front and side of the car respectively. Fig. 2 is a perspective view of one form of a spring clutch device used for securely grasping the cable which passes through the device to instantaneously stop the car in case of accident.

A is the elevator car.

B represents the depending frame attached to the bottom of the front side of the elevator car and capable of vertical movement in guideways C also attached to the bottom of the car, near its front side.

D are guide rods attached securely to and forming part of the depending frame. The upper ends of these guide rods pass through suitable guideways on the bottom front side of the elevator car.

E represents a pair of toggle levers pivoted together at E′ and E″, one of which has an upward extending arm F provided with toothed jaws on their lower inner ends E‴ also with a guide way E^4 between the levers and the jaws for the free passage of a cable when the levers are in their normal position shown.

G represents a stiff wire coil spring surrounding arm F and securely fastened at its upper end to a plate H which is suitably secured to the side of the elevator car. Arm F is securely fastened at its upper end, in any suitable manner, to plate H.

I represents a support pivoted to the car side for compressing and holding the spring wire coil G, in a suitable manner, in a compressed position by means of a latch or catch J movable horizontally in a guide way K in such a way that the end of catch J may engage the end 2 of the lever I, when the spring wire coil has been compressed by the support, to hold the spring compressed.

l′ is a spring coil attached at one end to the side of the car and at the opposite end to arm *l* of support I to prevent the support from dropping entirely down, when catch J is withdrawn from under it, in order that the support may be conveniently adjusted again.

L is a cord attached to slide J, passing through guideways on the car, and securely and tautly secured at its other end to the upper extremity of one of the guide rods D in such a manner that when frame B and its rods D are forced upward by frame B contacting with any obstacle in its descent, slide J by means of cord L will be drawn from under the wire spring coil support I, thus permitting the tension of spring G to assert itself against the upper pivoted ends of levers E, forcing the same downward and outward, thus securely and instantaneously grasping cable M by means of the toothed jaws E‴. This movement is facilitated by means of the friction of cable M on the jaws, as soon as there is the slightest change in the normal position of the levers, see Fig. 2.

Cable M is connected in any suitable man-

ner with the valve operating mechanism which stops the elevator car when this cable is slightly pulled in a downward direction. Cable M extends from the valve connection in a vertical direction at one side of the elevator shaft, passing through the guide way E on the toggle levers to a suitable support at the top of the shaft. This cable M operates the valve mechanism to stop the elevator, independently of the cable N which is used by the operator of the elevator car.

The safety device for instantaneously stopping the elevator car in case of accident in its ascent, see Fig. 1, is claimed in my application Serial No. 451,004, filed November 4, 1892.

The operation of the safety device is as follows: When the car is descending should any portion of a person or an article in one of the door ways of the shaft, project beyond the door way, such obstacle would contact first with frame B, elevating the same which would release support I, as before described, and the toothed jaws E''' of the toggle levers E would instantaneously and securely grasp cable M, pull the same downward, thus operating the valve controlling mechanism to stop the car before or by the time the bottom of the car had reached the obstacle to its progress.

It is evident that many changes may be made in the construction and arrangement of parts without departing from the spirit of my invention, for example, frame B may be extended partly or entirely around the bottom of the car, and other guide rods and clutching mechanism may be substituted for that shown.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in an elevator, of a cage, a movable frame B carried thereby and provided with vertical guide rods, vertical guide ways for said frame, a controlling cable, spring actuated grippers pivoted together and attached to the car, a guide way E^4 on the grippers, a spring support, and a latch to retain the spring support in a horizontal position, and connected to a vertical guide rod, as and for the purpose set forth.

2. The combination in an elevator of a car, a movable frame suspended therefrom and provided with guide-rods D, vertical guide ways C, a controlling cable *m*, spring actuated grippers, pivoted together and attached to the car, a support, and a slide adapted to engage the support and attached to the side of the car and connected to one of rods D, as and for the purposes, set forth.

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

HENRY HALE DAY.

Witnesses:
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