

H. G. HILLMAN.
SAFETY DEVICE.
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981,423.

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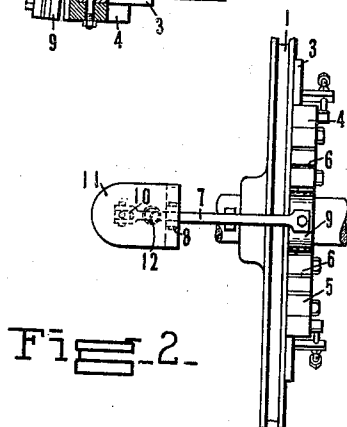
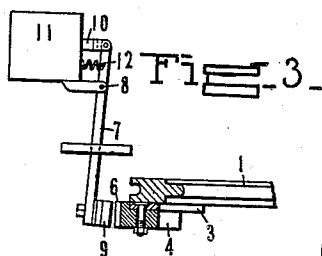
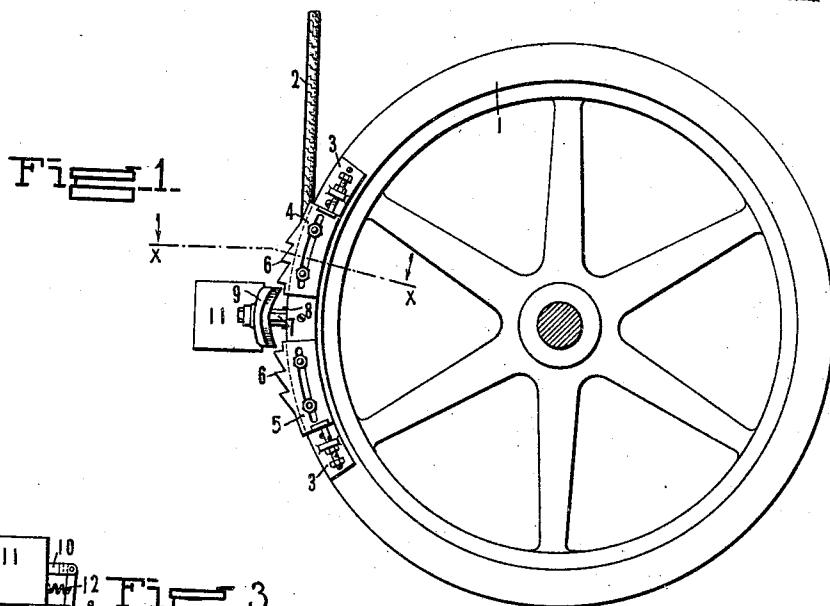
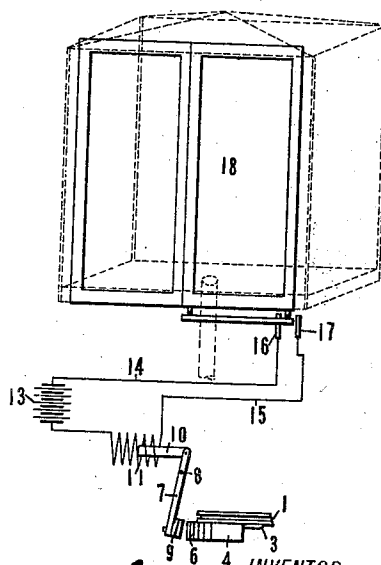


Fig. 4.



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SAFETY DEVICE.

981,423.

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To all whom it may concern:

Be it known that I, HENRY GEORGE HILLMAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Safety Devices, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to safety devices and with regard to the more specific features thereof, to devices for locking the power controlling mechanism of elevators and the like.

One of the objects thereof is to provide a practical and reliable device of the above character.

Another object thereof is to provide a durable device adapted to automatically lock the power controlling mechanism of an elevator in neutral position in case the elevator doors are opened while the car is at rest.

A further object thereof is to provide a simple, inexpensive and efficient means adapted, should the doors be opened, to automatically prevent the operator increasing the speed of the elevator, yet enabling him to decrease the speed thereof or bring the same to rest.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings wherein is illustrated one of the various possible embodiments of this invention, Figure 1 is a front elevation of a wheel adapted to actuate the controlling mechanism of elevators, with the safety locking device arranged in operative relation thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-section taken on line $x-x$ of Fig. 1, and Fig. 4 is a diagrammatic view showing the electric connections of the solenoid by which the latch is operated, when the elevator doors are opened.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Now referring to the drawings, 1 denotes a wheel of any suitable construction which may be secured, either directly or indirectly, to a valve adapted to control the admission and exhaust of fluid to the plunger cylinder of a hydraulic elevator, and attached to said wheel is a cable 2 which may be connected to a lever or other operating device located in the elevator car. Rigidly secured to the rim of the wheel is a member 3, having adj-justably attached thereto spaced members 4 and 5, each provided with ratchet teeth 6 upon its outer, circumferential surface. These members are disposed upon either side of the neutral point in the wheel's periphery and the teeth of both incline toward said neutral point.

It may here be noted that the expression "neutral position" is used in this specification and claims to indicate the position assumed by the valve or other controlling mechanism, when the elevator is at rest and that with reference to the valve wheel, the "neutral point" is that point in the circumference thereof which will be opposite the latch or other locking means when the controlling mechanism is in "neutral position".

A lever 7, pivoted at 8, has secured to one end thereof a double toothed latch or pawl 9 which, when the controlling mechanism is in neutral position, is adapted to assume a position between the opposing ends of the members 4 and 5 and, when the controlling mechanism is out of neutral position, to engage with whichever of the teeth 6 is in alignment therewith. Pivotaly secured to the opposite end of the lever 7 is a plunger 10 adapted to be drawn within the solenoid 11 and a spring 12 is provided to force the lever in the opposite direction when the solenoid circuit is broken.

Fig. 4 shows, diagrammatically, the circuit in which the solenoid 11 is connected. 13 denotes an electric battery and 14 and 15 the wire connections leading from the battery and solenoid to the contact members 16 and 17. The specific form of switch employed to close the battery circuit is unimportant and forms no part of the present invention. It is, therefore, deemed sufficient to state that when the doors 18 of the elevator or elevator shaft, as the case may be, are closed, the battery circuit is open and the solenoid unenergized and that upon the doors being opened to the slightest degree

the circuit is immediately closed and the solenoid excited.

Having described one embodiment of my invention, the operation thereof follows:

5 First assuming that the elevator doors are closed, the wheel 1 may be actuated by the operator to attain the desired elevator speed. If, however, while the elevator car is station-
 10 ary, the doors are opened, the solenoid becomes energized and retracts the plunger 10 whereby the latch 9 is projected into the space provided therefor between the inner ends of the members 4 and 5, locking the wheel against rotation and preventing the
 15 operator from starting the elevator in either direction. The members 4 and 5 are adjusted so as to allow sufficient clearance between the inner ends thereof and the latch 9 to readily compensate for any leakage of the pistons or valves. When the doors are again
 20 closed by the operator the solenoid circuit is broken, whereupon the spring 12 forces the plunger end outwardly, withdrawing the latch 9 from its locking position and permit-
 25 ting the operator to again start the elevator. If, on the other hand, the doors 18 are opened while the elevator is moving, the circuit will be closed as before, but as, under these conditions, the mechanism is not in
 30 neutral position, the latch 9 will be forced into engagement with one of the ratchet teeth 6, locking the wheel so that it cannot be moved by the operator to increase the
 35 speed of the elevator, but may be rotated to reduce the speed thereof, or to bring the same to rest, whereupon the parts will be securely locked as hereinbefore described. It is to be noted that instead of a wheel, a
 40 lever might be used and the locking device secured thereto in any convenient manner. It is to be understood that while certain advantages are present in the embodiment
 45 herein described wherein the latch is put in operation when the circuit is closed by the opening of the elevator doors, the invention is not to be limited to such an arrangement, for if desired the latch may be thrown into
 50 engagement mechanically, as by a spring, and released by the solenoid. In the latter case the circuit of the solenoid would be closed when the doors are shut.

It will be seen from the foregoing description that this invention is well adapted to attain the objects hereinbefore set forth
 55 in an efficient and reliable manner; that it is characterized by a minimum of parts liable of injury under the exigencies of usage; and that said parts are inexpensive to construct and install.

60 As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all mat-
 65 ter contained in the above description or

shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of lan-
 70 guage, might be said to fall therebetween.

Having described my invention, what I
 75 claim as new and desire to secure by Letters Patent is:

1. In apparatus of the character described, in combination, an elevator, doors, means for controlling the operation of said elevator
 80 adapted to be moved to either side of a neutral position, and means adapted, upon said doors being opened, to lock said controlling means in all positions thereof against move-
 85 ment in either direction away from said neutral position and permit a movement of said controlling means toward said neutral position.

2. In apparatus of the character described, in combination, an elevator, doors, means for
 90 controlling the operation of said elevator adapted to be moved away from a neutral position, and means adapted, upon said doors being opened, to lock said controlling
 95 means in all positions thereof against movement away from said neutral position and permit a movement of said controlling means toward said neutral position.

3. In an apparatus of the character described, in combination, an elevator car,
 100 doors at the several floors, means controlling the operation of said elevator car adapted to be moved to either side of a neutral position, a circuit adapted to be
 105 opened and closed by the movement of the doors, a rack associated with said controlling means, and means adapted to engage said rack to allow movement of the control-
 110 ling means toward the neutral position but not away therefrom when the doors are open.

4. In an apparatus of the character described, in combination, an elevator car,
 115 doors at the several floors, means controlling the operation of said elevator car adapted to be moved to either side of a neutral position, a circuit adapted to be closed when
 120 said doors are open, a rack associated with said controlling means, a solenoid, and means connected with the core of said solenoid adapted to engage said rack and allow
 movement of the controlling means toward the neutral position but not away there-
 from when said circuit is closed.

5. In apparatus of the character described, in combination, an elevator, doors, means for
 125 controlling the operation of said elevator adapted for movement to either side of the neutral position, a ratchet associated with
 130 said controlling means, and a pawl adapted,

upon said doors being opened, to engage said ratchet to lock said controlling means in all positions thereof against movement away from its neutral position and permit a movement of said controlling means toward said neutral position.

6. In apparatus of the character described, in combination, an elevator, doors, means for controlling the operation of said elevator adapted for movement to either side of a neutral position, a ratchet associated with said controlling means, and a pawl adapted, upon said doors being opened, to engage said ratchet and permit movement of the controlling means toward the neutral position and lock the same against movement in an opposite direction.

7. In apparatus of the character described, in combination, an elevator, doors, means for controlling the operation of said elevator adapted for movement to either side of a neutral position, a ratchet associated therewith and provided with teeth inclining toward a predetermined point from both sides thereof, and a pawl adapted, upon said doors being opened, to engage said ratchet whereby recession of said controlling means in either direction away from its neutral position is prevented.

8. In apparatus of the character described, in combination, an elevator, doors, means for controlling the operation of said elevator adapted for movement to either side of a neutral position, a ratchet associated therewith and provided with teeth inclining toward a predetermined point from both sides thereof, a pawl adapted to engage said ratchet, and magnetic means adapted to actuate said pawl upon said doors being opened.

9. In apparatus of the character described, in combination, an elevator, doors, means for controlling the operation of said elevator adapted for movement to either side of a neutral position, a ratchet associated therewith comprising two sets of teeth, the teeth of each set being oppositely disposed with respect to those of the other and a pawl adapted, upon said doors being opened, to engage said ratchet whereby recession of said controlling means in either direction away from its neutral position is prevented.

10. A safety lock for elevators, comprising in combination, a member having a neutral notch and provided with ratchet teeth disposed on opposite sides of and inclined toward said notch, and a latch adapted to be brought into interlocking contact with said member in all positions of the latter.

11. A safety lock for elevators, comprising in combination, a member having a neutral notch and provided with ratchet teeth disposed on opposite sides of and inclined toward said notch, and a latch provided with oppositely disposed detents

adapted to be brought into interlocking contact with said member in all positions of the latter.

12. A safety lock for elevators, comprising in combination, a member having a neutral notch and provided with ratchet teeth disposed on opposite sides of and inclined toward said notch, a latch provided with oppositely disposed detents adapted to be brought into contact with said member in all positions of the latter, and magnetic means adapted to actuate said latch.

13. A safety lock for elevators, comprising in combination, an elevator valve wheel, a member secured thereto having a neutral point and provided with ratchet teeth disposed upon opposite sides of and inclined toward said point and an automatically actuated pawl adapted to engage said member.

14. A safety lock for elevators, comprising in combination, an elevator valve wheel adapted to turn beyond a neutral position in either direction, a member secured thereto having a neutral notch and provided with ratchet teeth disposed upon opposite sides of and inclined toward said notch, and a pawl adapted, with said wheel in its neutral position, to engage the sides of said notch to prevent rotation of said wheel.

15. A safety lock for elevators, comprising in combination, an elevator valve wheel adapted to turn beyond a neutral position in either direction, a member secured thereto having a neutral notch and provided with ratchet teeth disposed upon opposite sides of and inclined toward said notch, and a pawl adapted, with said wheel in its neutral position, to engage the sides of said notch to prevent rotation of said wheel, said notch and said pawl being relatively proportioned to interfit with a predetermined amount of clearance in the direction of rotation of said wheel.

16. A safety lock for elevators, comprising in combination, an elevator valve wheel adapted to turn beyond a neutral position in either direction, a member secured thereto having a neutral notch and provided with ratchet teeth disposed upon opposite sides of and inclined toward said notch, and a pawl adapted, with said wheel out of neutral position, to engage said teeth to prevent further recession of said wheel from said position.

17. A safety lock for elevators, comprising in combination, an elevator controlling means adapted for movement to either side of a neutral position, a member rigidly secured thereto, two ratchet members slidably supported by said first member, each of said ratchet members being adjustable toward and away from a neutral point therebetween and each having teeth inclining toward said neutral point, a latch adapted, with said controlling means in neutral

position, to be received between the opposing inner ends of said ratchet members and, with said controlling means out of neutral position, to be thrown into engagement with
5 one of said teeth, and means adapted to actuate said latch.

10 18. In elevating apparatus, in combination, controlling means associated with an elevator, doors, a ratchet member secured to said controlling means, a latch and a solenoid connected in a circuit adapted to be closed when said doors are opened where-

by said latch will be thrown into engagement with said ratchet, said ratchet having
15 teeth pointed toward a neutral point where- by the controlling means may be moved toward a neutral position and locked against movement in an opposite direction.

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

HENRY G. HILLMAN.

Witnesses:

R. S. BLAIR,

H. M. SEAMANS.