

No. 887,651.

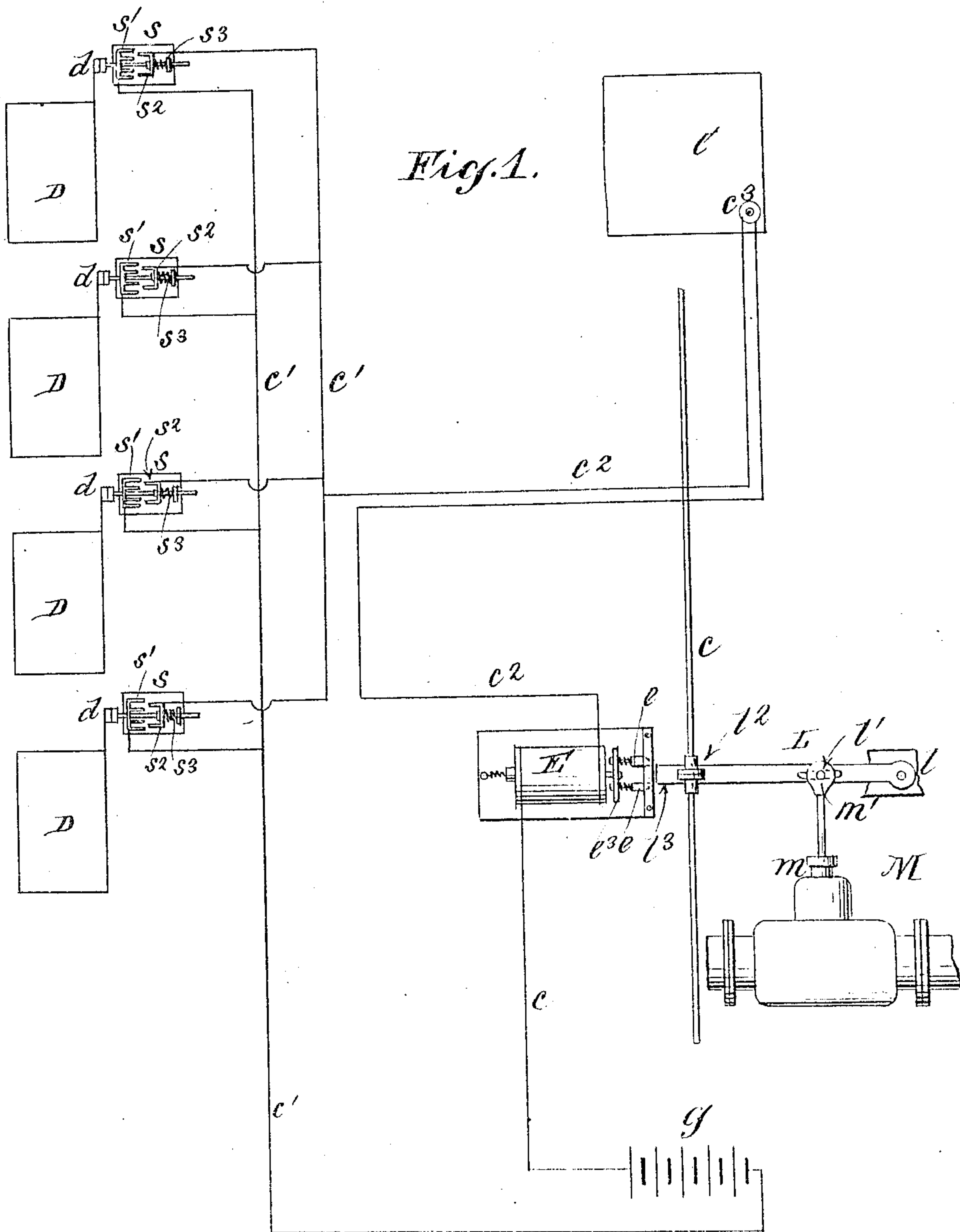
PATENTED MAY 12, 1908.

W. J. KERN.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED JUNE 20, 1907.

2 SHEETS—SHEET 1.



Witnesses:

D. W. Gardner.

C. Johns

Inventor:

William J. Kern

By his Attorney

Geo. W. Heath

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2 SHEETS—SHEET 2.

Fig. 2.

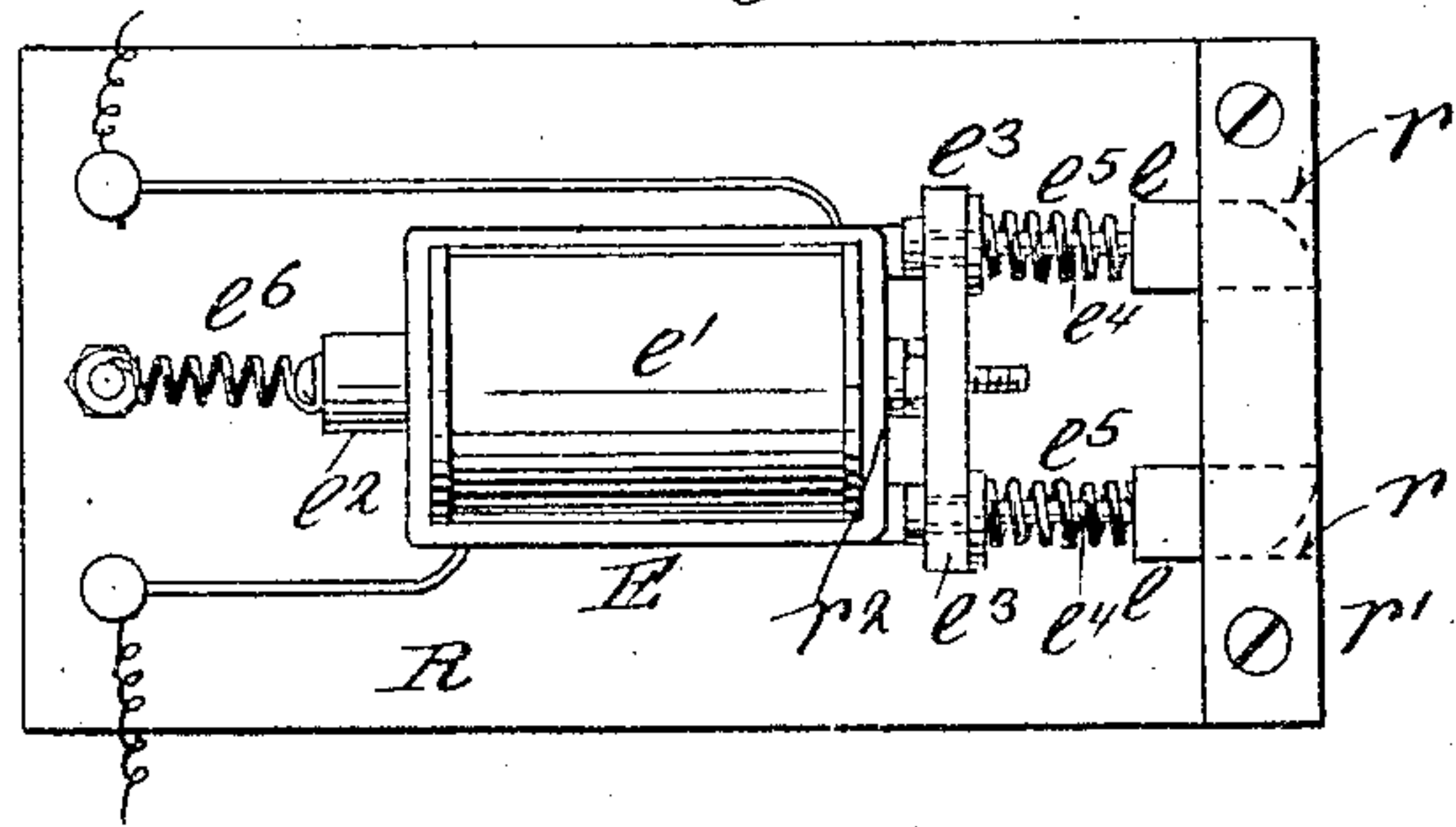


Fig. 3.

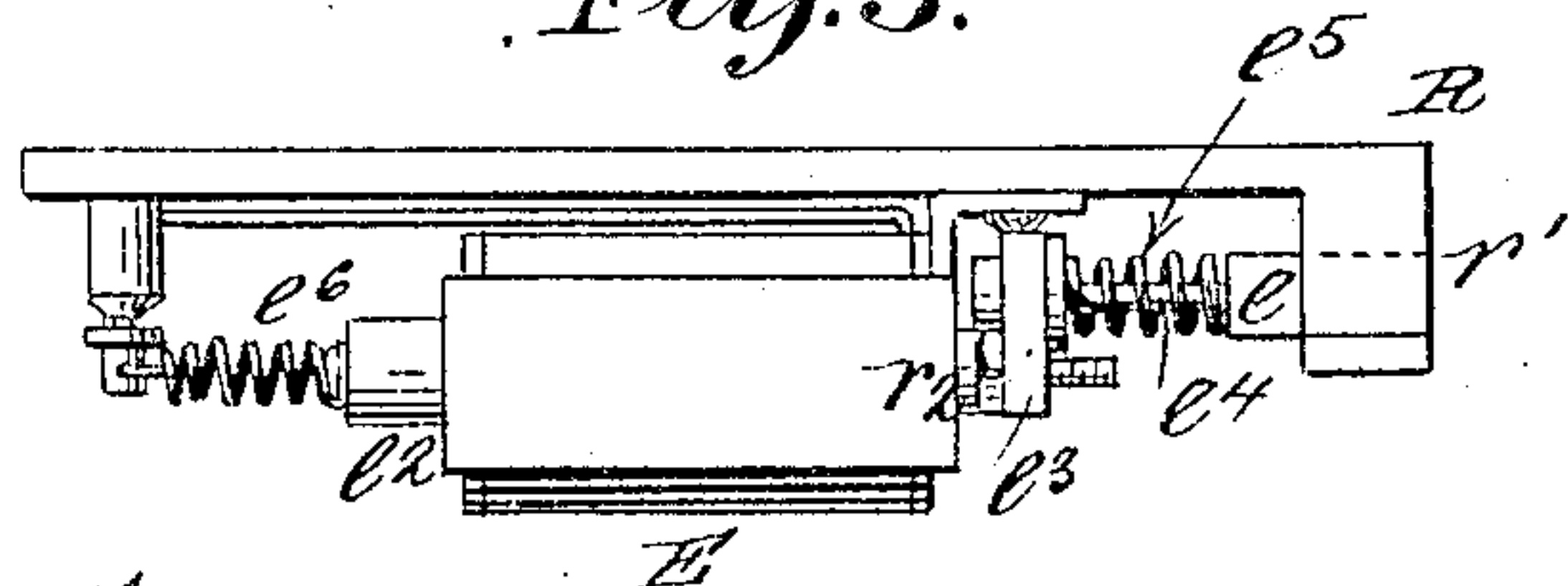


Fig. 5.

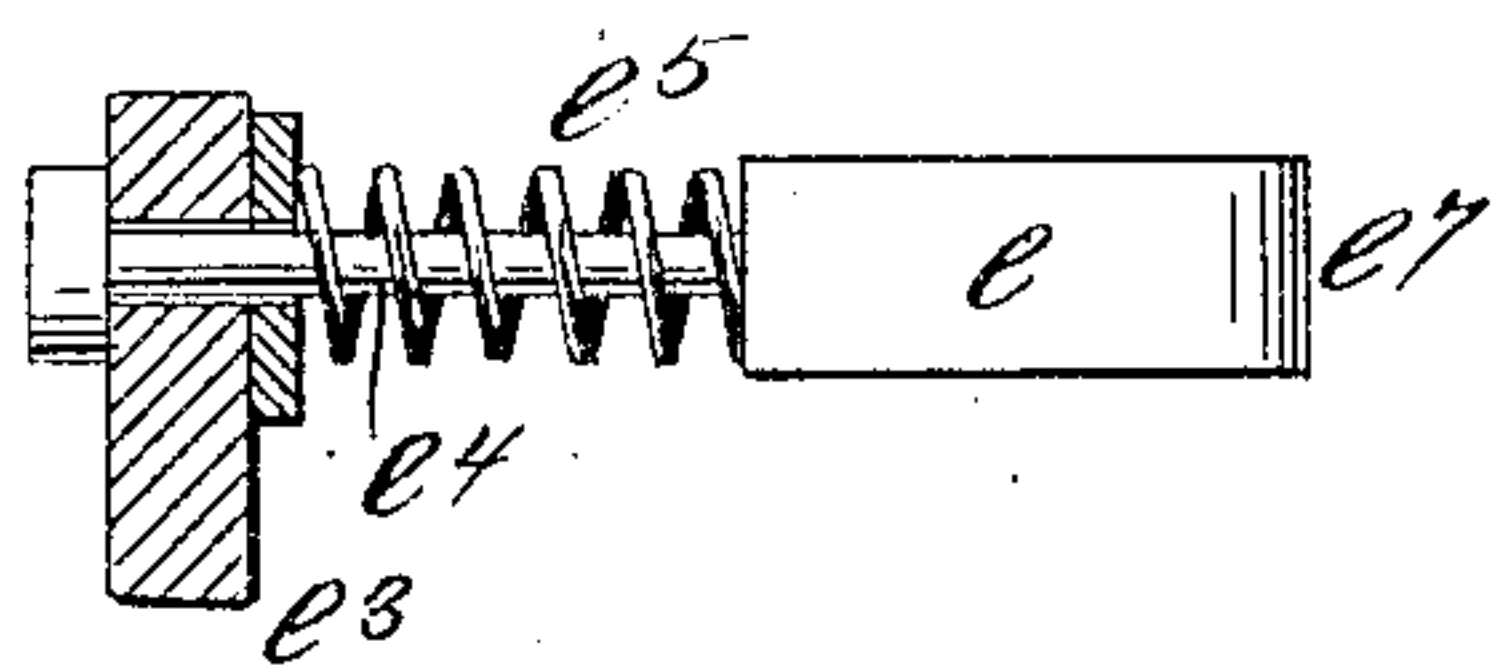


Fig. 4.

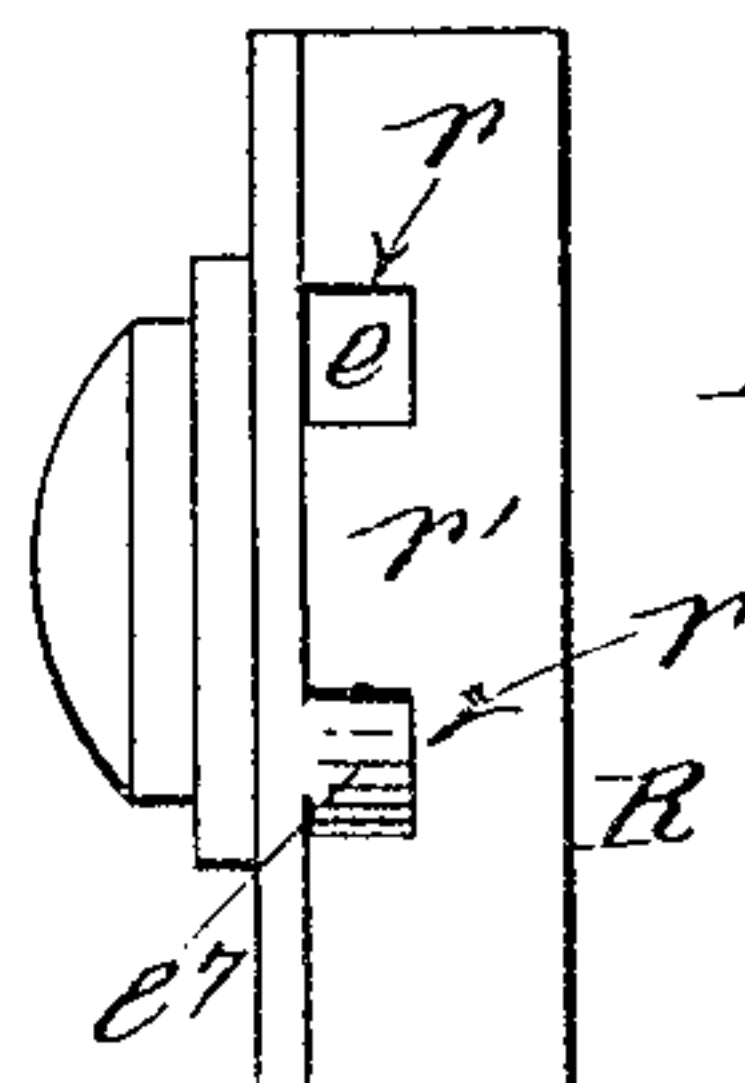
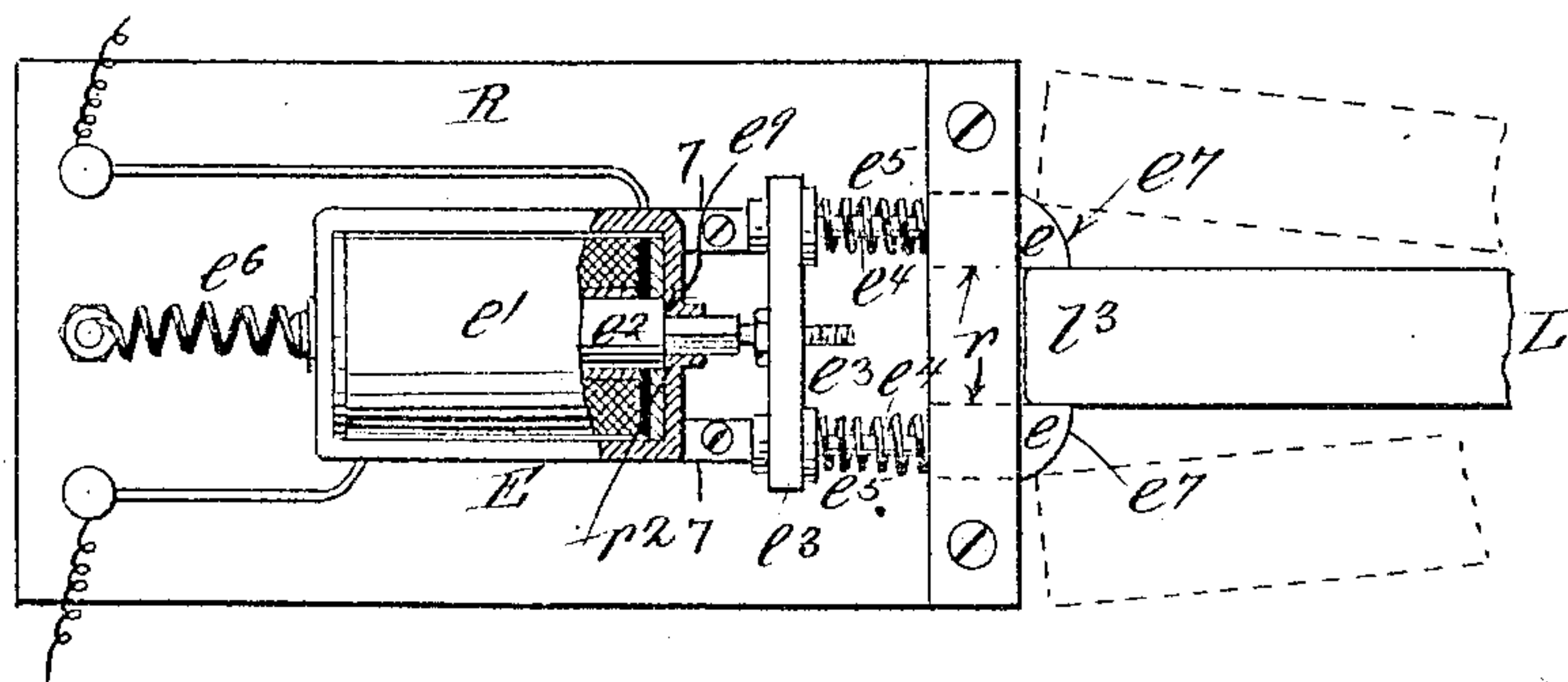


Fig. 6.



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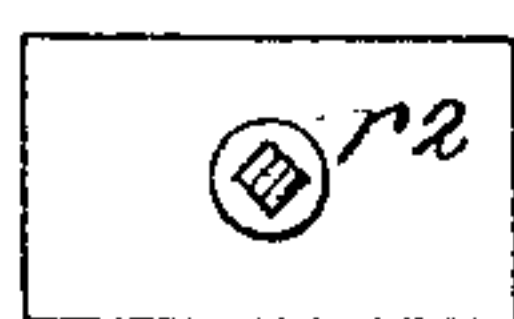


Fig. 7.

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UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR ELEVATORS.

No. 887,651.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed June 20, 1907. Serial No. 379,826.

To all whom it may concern:

Be it known that I, WILLIAM J. KERN, a citizen of the United States, residing in West Hoboken, Hudson county, and State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

My improvements relate to the class of electrical appliances used to lock the motor valve controlling lever when a door is opened in the elevator shaft, and are designed to afford a simple, cheap and effective automatic locking device adapted to be run on low voltage, in which lateral strain and wear are reduced to the minimum, and in which provision is made for releasing the locking mechanism from the car itself when desired as hereinafter set forth.

The invention consists in the arrangement and construction of parts hereinafter described and claimed specifically, distinguishing features being a pair of retractile, individually yielding latches which, when advanced, constitute a mortise or socket for engagement with the controlling lever, and an auxiliary electric circuit arranged in connection with the car and including a circuit opening and closing device upon the latter, whereby the said mortise bolts may be retracted by the operator on the car to release the valve controlling lever even though a door in the elevator shaft be open.

In the accompanying drawings, Figure 1, is a view illustrating diagrammatically and symbolically the practical application of my invention; Fig. 2, is an elevation of my improved locking device; Fig. 3, an elevation of the same taken at right angles to Fig. 2; Fig. 4, a front view of the lock; Fig. 5, a detail view of one of the bolts; Fig. 6, a view showing the bolts advanced and illustrating the relation of the valve controlling lever thereto; Fig. 7, a section on plane of line 7—7—Fig. 6.

I herein show and refer to only those parts of an ordinary elevator system essential to an understanding of the practical application of my invention. Thus C represents symbolically a car of any desired construction to be raised and lowered in a shaft by ordinary and well known means through the medium of the line c , extending from the car to the lever L, by which the usual motor-controlling mechanism M is actuated. D, D, indicate in like manner the doors to the elevator shaft and are shown upon the left hand side of the

sheet for convenience in illustrating the safety circuit c' , c' , in which latter are interposed the electrical generator g , the electro magnet E, the cable loop c^2 , and the switches s , s , one of the latter being provided for each door D in the elevator shaft.

c^3 , represents a contact button or switch upon and traveling with the car and interposed in the cable loop c^2 , said switch c^3 , being normally closed.

The switches s , s , are of any suitable form or construction, provided that each is adapted to close automatically when the door connection with which it is arranged is opened. Thus, by way of illustration s' , are stationary contacts, and s^2 , are movable contacts held normally away from the stationary contacts s' , against the resistance of springs s^3 , by bearings d , on the doors D when the latter are closed. The opening of a door allows the spring s^3 , to force the movable contact s^2 , into engagement with the stationary contact s' , thereby closing the circuit. Both the stationary and the movable contacts are preferably though not necessarily of the knife blade class.

The motor controlling mechanism M consists primarily of the usual pilot valve m , or any other device that may be operated by the lever L or equivalent mechanical expedient. As shown in the drawings the lever is of the second order, being fulcrumed at l , upon a stationary part, is pivotally connected at l' , to the valve rod m' , and attached at l^2 , near its outer end to the elevator line c by the usual swivel coupling. The outer extremity of the controlling lever L is preferably rectangular or it is otherwise formed with a locking portion l^3 , for engagement with the twin latches e , e .

The locking mechanism which is a special feature of my invention consists of an electro-magnetic solenoid e' , interposed in the circuit c' , as before stated, and controlling a plunger e^2 , to which is secured a cross head of non-magnetic material e^3 . On this cross head e^3 , are mounted the twin latches e , e , in the following manner. Each latch e , is angular in cross section (preferably rectangular as shown in the drawings) and rests in part in a correspondingly formed recess r , in a flange r' , of the supporting plate R. Projecting from the rear of each latch e , e , and integral therewith is a rod e^4 , passing through a perforation in the cross head e^3 , and

headed or shouldered at the rear end to prevent its withdrawal therefrom. Surrounding the rod e^4 , and interposed between the latch e and the cross head e^3 , is a coiled spring e^5 , which tends constantly to press and hold the latch away from the cross head e^3 , and as the plunger e^2 , is normally, (when the circuit e' , is open) held retracted by the spring e^5 , with the cross head e^3 , resting against the frame r^2 , or other stationary part, it follows that under these conditions the curved outer ends of the latches will be retracted within the recesses r , r , as shown in Figs. 1, 2 and 3. In Fig. 6, the plunger e^2 , is shown as advanced by the closing of the current, thereby projecting the outer ends of the latches e , e , beyond the recesses r , and into the path of the locking portion l^3 , of the lever L ,—this forward thrust being limited by reason of the contact of a shoulder e^6 , on the plunger e^2 , with the inner side of the frame r^2 , or by any other suitable stopping device.

The twin latches e , e , are arranged in practically the same plane as that of the motion of the controlling lever L to the locking portion l^3 , of which they are opposed. The distance between the opposed inner sides of the latches e , e , is equal approximately to the width of the locking portion l^3 , of the controlling lever L , so that when the latter is in its intermediate or neutral position its locking portion will coincide with the space between the twin latches e , e , and if the latter are advanced by the solenoid e' , will be locked thereby against movement in either direction as illustrated in solid lines in Fig. 6. It is to be understood that if the twin latches are advanced before the locking portion l^3 , of the lever L attains this neutral position, as while it is in either of the positions indicated by dotted lines in Fig. 6, the moving of said locking portion l^3 , into said neutral position will, by reason of its contact with the inclined face e^7 , of the latch, automatically force the latter back against the resistance of the spring e^5 , until the point or nose e^7 , is passed, when the spring e^5 , will immediately return the latch to secure the locking portion l^3 , between its flat inner side and the opposed flat inner side of its twin latch,—these two practically constituting when advanced, a recess or mortise with yielding side walls into which space the locking portion l^3 , of the controlling lever L may force itself when traveling in either direction, and in and by which it will be positively held against further movement in either direction until released by the retractile movement of the twin latches e , e , when the electric circuit is broken and the plunger e^2 , released by the solenoid e' .

This form of locking mechanism possesses many practical advantages. It is comparatively cheap and simple, works freely and with the minimum of frictional resistance so

that a low voltage is sufficient to operate it and while positive in operation is of a yielding character that eliminates all danger of fracture from undue strain. In fact all lateral strain on the parts other than the bodies of the twin latches e , e , and the opposed side walls of the recesses r , is obviated, and as said side walls are of steel or other hard metal and fit snugly around the latches the latter are sustained laterally against any strain to which it is possible to subject them in ordinary use, while the accurate preservation of their perfect alinement prevents the transmission of any lateral strain to cross head, plunger and connections. Furthermore the locking mechanism is compact, occupying but little space itself and admitting of the use of the simplest possible form of controlling lever having no incumbrances relating to said locking mechanism.

By including the car in the electric circuit and providing means upon the car itself for breaking the electric circuit and releasing the controlling lever, I obviate all danger of the car being stalled between doors if one of the latter should be opened accidentally or otherwise while the car is in an intermediate position, and also facilitate access to the top or bottom of the car for purposes of cleaning, repair or the like.

What I claim as my invention and desire to secure by Letters Patent is,

1. In elevator safety appliances of the character designated, the combination of an electric circuit including one or more door-controlled switches, motor-controlling mechanism, a controlling lever connected therewith, an electromagnet in said circuit consisting of a solenoid and plunger, twin latches mounted upon said plunger by means which allow them to yield lengthwise under pressure, said latches being arranged to lock said controlling lever in its neutral position, and lateral supports for said latches.

2. In elevator safety appliances of the character designated, the combination of an electric circuit including one or more door-controlled switches, motor-controlling mechanism, a controlling lever connected therewith, an electromagnet in said electric circuit consisting of a solenoid and plunger, two yielding latches mounted upon said plunger, said latches being formed with inclined faces and being arranged to lock said controlling lever in its neutral position, and lateral supports for said latches.

3. In elevator safety appliances of the character designated, the combination of an electric circuit including one or more door-controlled switches, motor-controlling mechanism, a controlling lever connected therewith, an electromagnet in said electric circuit consisting of a solenoid and plunger, a cross head on said plunger, spring latches mounted on said cross-head and formed with inclined

faces, and lateral supports for said latches, the latter being arranged to lock said controlling lever in its neutral position.

4. In elevator safety appliances of the
5 character designated, the combination of an electric circuit including one or more door-controlled switches, a car, a switch on said car included in said electric circuit, motor
controlling mechanism, a controlling lever
10 connected therewith, an electro magnet in said circuit consisting of a solenoid and

plunger, twin latches mounted upon said plunger by means which allow them to yield lengthwise under pressure, said latches being arranged to lock said controlling lever in its
neutral position, and lateral supports for said
latches. 15

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Witnesses:

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