R. PITT.

ELEVATOR GATE CONTROLLING DEVICE.

APPLICATION FILED DEC. 9, 1914.

1,249,188.

Patented Dec. 4, 1917.

3 SHEETS—SHEET 1.

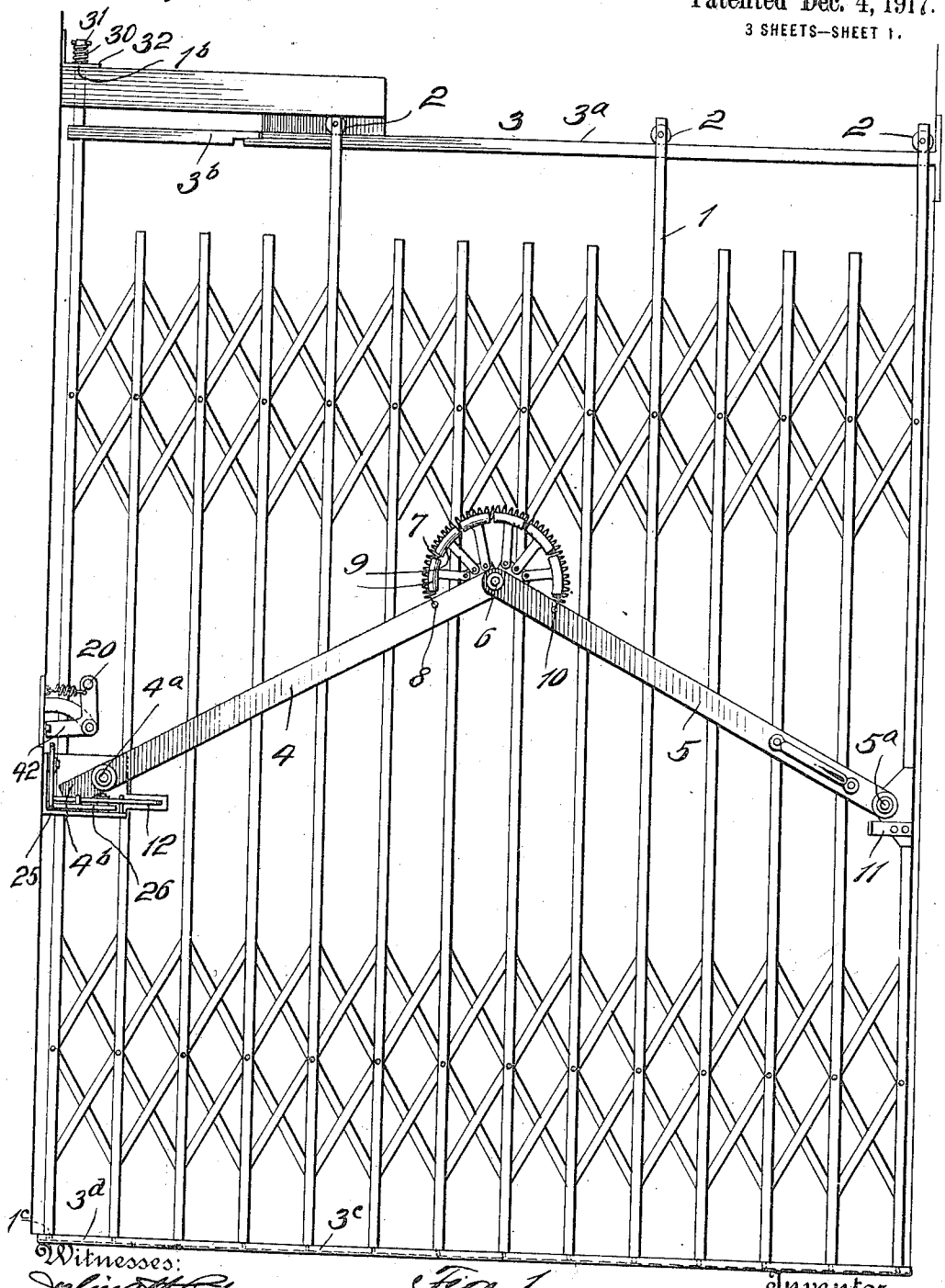


Fig. 1.

Witnesses:

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3 SHEETS—SHEET 2.

Fig. 2.

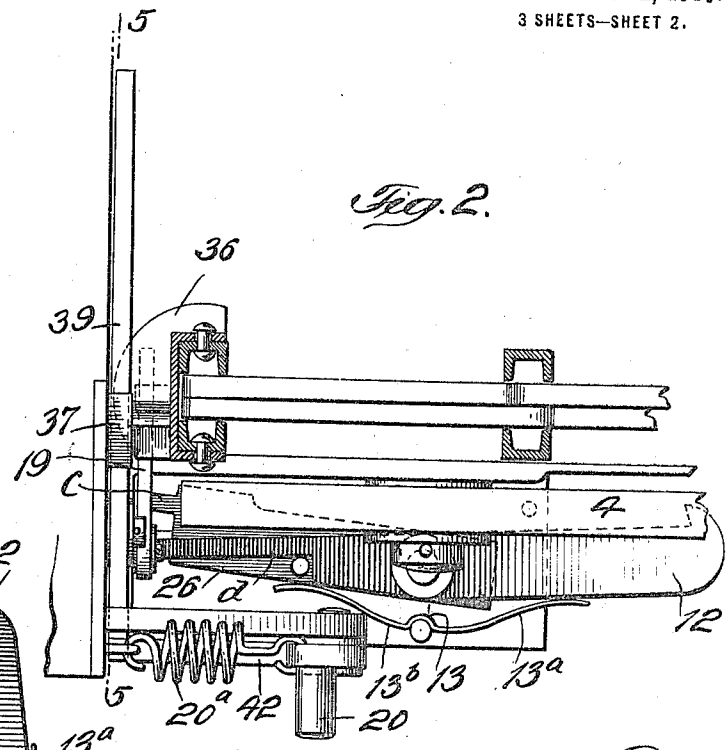


Fig. 3.

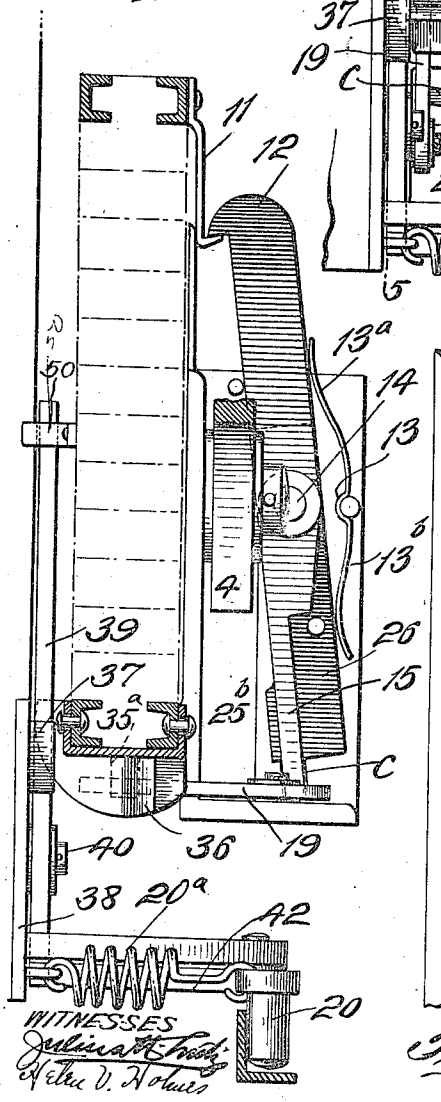
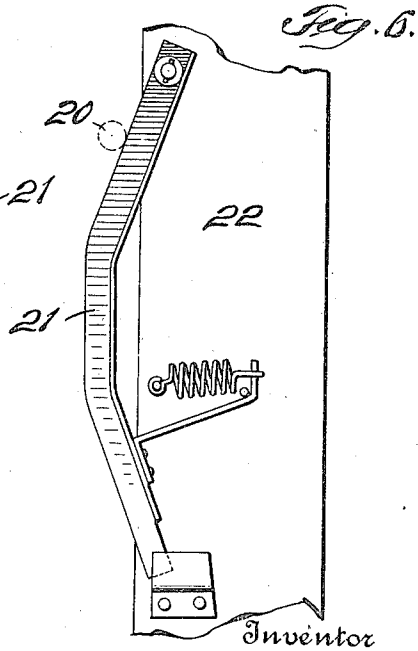


Fig. 6.



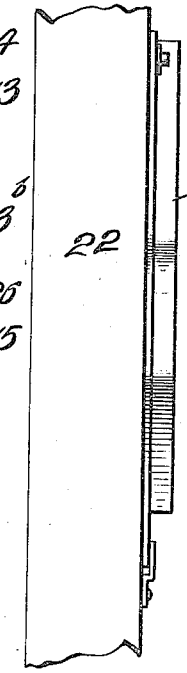


Fig. 7.

WITNESSES

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3 SHEETS—SHEET 3.

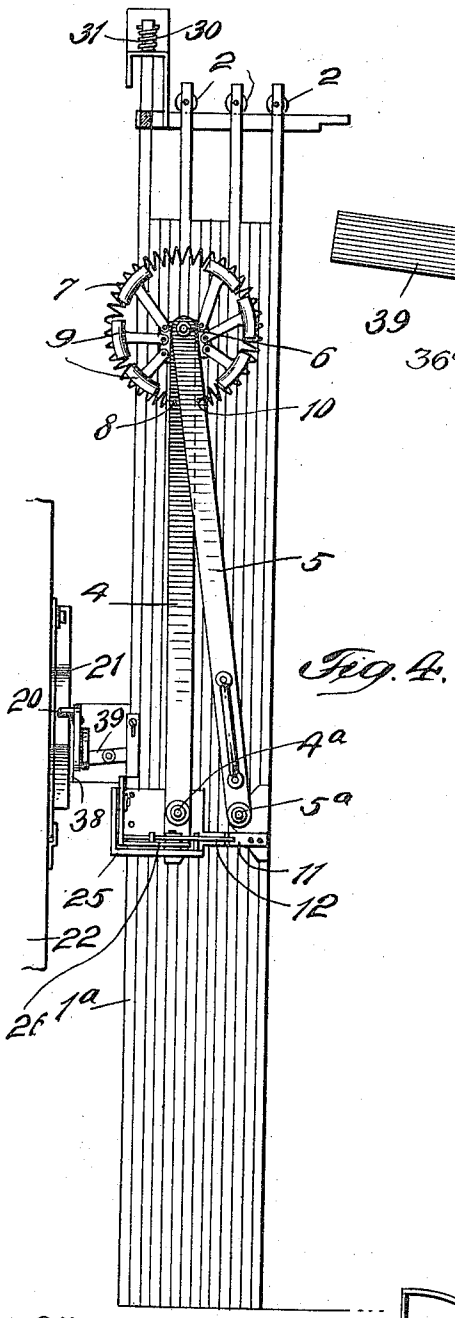


Fig. 4.

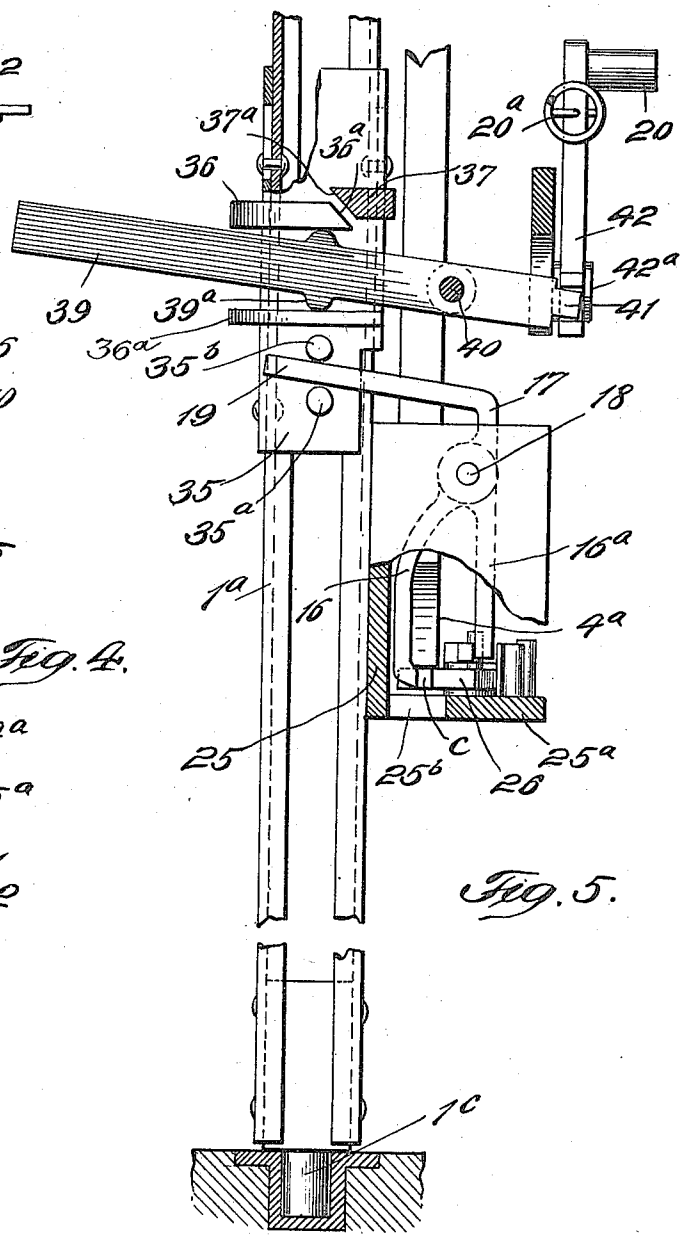


Fig. 5.

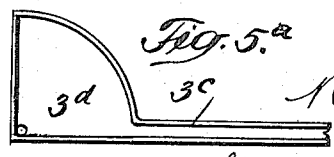


Fig. 5a.

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UNITED STATES PATENT OFFICE.

RAFFORD PITT, OF NEW ROCHELLE, NEW YORK.

ELEVATOR-GATE-CONTROLLING DEVICE.

1,249,188. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed December 9, 1914. Serial No. 876,194.

To all whom it may concern:

Be it known that I, RAFFORD PITT, a citizen of the United States, and a resident of New Rochelle, Westchester county, State of New York, have invented certain new and useful Improvements in Elevator-Gate-Controlling Devices, of which the following is a specification.

This invention relates to improvements in elevator gate controlling devices.

By the use of my invention I provide a device which is so automatically controlled by the movement of the elevator car that a gate or the like which may, during the stay of the elevator car at its proper position at the floor, be collapsed or moved laterally and latched in collapsed position, and which may then be swung around pivotally into full-open position to enable the use of the full width of the gateway or shaft, and be also latched in that position, and will, so soon as the elevator car leaves its proper position at the floor, automatically swing pivotally from such full-open position to a position parallel with the edge of the elevator shaft, and will then be further automatically actuated into extended or closed position so as to close the shaft opening and will then be automatically locked in such extended position until the elevator car again reaches its proper position at the floor.

Another feature of my invention is the provision in a device of the character specified of a pair of toggle arms or levers, one of which arms or levers has a pivotal connection at one of its ends with a movable portion of the gate or the like, and the other lever has a pivotal connection at one of its ends with the door frame or other relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have a pivotal connection with each other, in combination with a spring located at the said intermediate connection and adapted normally to force the levers into extended position to close the gate or the like; and means releasable by the movement of the elevator car to a predetermined position for automatically locking one of said levers in extended position to lock the gate or the like.

In the accompanying drawings, in which similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a side elevation of the gate embodying my invention;

Fig. 2 is a fragmentary plan view of the gate in extended position;

Fig. 3 is an enlarged detail similar to Fig. 2, the gate being in collapsed or latched position and swung pivotally and latched in position in full-open position at right angles to its extended position;

Fig. 4 is a side elevation of the gate in the same position indicated in Fig. 3;

Fig. 5 is an enlarged detail view of the means for retaining the gate in collapsed and in full-open position, the view being on the line 5—5 of Fig. 2 with the gate in extended position;

Fig. 5^a is a plan view of the rear portion of the lower track for the gate;

Fig. 6 is an enlarged detail of a portion of a car and the actuating shoe thereon;

Fig. 7 is a view in elevation of the said actuating shoe and portion of the car taken at right angles to Fig. 6.

Referring now to these drawings 1 is a closure for a shaft opening which, as shown, is in the form of an extensible and collapsible gate of any suitable pattern and is guided at its top into collapsed and extended position by means of rollers 2 running upon a track 3 extending transverse the shaft opening and preferably has a connection at its bottom with a slot 3^c having an arc-shaped portion 3^d at its rear end. Said track 3, as shown, is composed of two parts, the part 3^a being fixed and the part 3^b being adapted to swing pivotally in relation thereto, so that when the gate 1 is fully collapsed, as shown in Fig. 4, all the rollers 2 will be mounted upon and carried by the movable track section 3^b so that the gate may then be swung bodily into full-open position at right angles to the fixed section 3^a of the track 3, the lower edge of the gate traversing the arc-shaped cut-out portion 3^d.

In the preferred embodiment of my invention illustrated, I provide means for automatically actuating the said gate 1 or similar device, such as a door, into normally closed or extended position, the said means comprising a pair of levers or toggle arms 4—5 pivoted together at one end as at 6 and one of said levers being pivoted at its opposite end 5^a to a movable portion of the gate, and the opposite end of the other lever being pivoted as at 4^a to a relatively fixed point, a contractile spring 7 being so arranged at

the junction of said two arms as to exert pressure to force the said two arms and consequently the gate normally into extended relation. As illustrated, the spring 7 is connected at one end in an aperture 8 in the arm or lever 4, is guided by a series of T-shaped pivoted guide bars 9 in a circular path around the pivotal point 6 and is connected at its opposite end to the arm 5 through an aperture 10.

Suitable means for locking the levers in extended position is provided which locking means is normally retained in locking position and is released by the movement of the car to its proper position at a floor. As shown, the end of the lever 4 is extended as at 4^b beyond the pivotal point 4^a and the lower corner of such extended portion is preferably cut down so that this cut down portion will preferably assume a horizontal position when the gate is in extended position. Suitably mounted contiguous to the said extended portion 4^b and preferably on the rear pivotal but relatively stationary upright member of the gate, I provide a supporting bracket 25 having a horizontally extending shelf 25^a provided with an aperture or slot 25^b through which the end of the lever extends when the gate is in collapsed position, and above which the cut off portion of the rearward extension of the lever is positioned when the gate is in its extended position. Pivotally mounted on a pivot 14 supported on the horizontal shelf 25^a is a lock plate 26 adapted to be pressed beneath said extended portion 4^b of the lever 4 by means of one leg 13^b of a double acting spring 13 when the gate is in extended position, so as to prevent the movement of said extended portion through the slot or aperture 25^b and thus to lock the levers and gate in extended position. Said lock plate 26 is normally retained in its locked position but is operatively connected with a bearing or contact stud 20 adapted to engage and be moved by a spring pressed shoe 21 on the side of an elevator car 22, whereby when the spring pressed bearing or contact stud 20 is engaged by the spring pressed shoe 21 on the car 22, it will actuate the leg 16 of the fork 17 to engage the lock-plate 26 and move the same out of locking engagement so that the gate may be collapsed or opened.

To retain the gate in collapsed position against the action of the spring 7 I mount at the front edge of the gate a hook 11 which is adapted to engage with a latch 12 pressed into latching engagement by one end 13^a of said double-acting spring 13, said latch being, as shown, pivoted on the pivot 14 and having a rearward extension 15 adapted to be engaged and released by the other leg 16^a of said two-legged fork 17 which is, as aforesaid, in operative connection with said bearing or contact stud 20. When the bearing or contact stud 20 is in its normal position under the tension of the spring 20^a, the leg 16^a of the fork 17 will retain the latch 12 in normally released position and the gate will be subject to the action of the spring 7 acting through the levers 4 and 5 so that said gate will be extended, but when the said car comes to its proper position at the floor, and the said contact stud is engaged and moved by the shoe 21 of the car 22, the fork 17 will be oscillated so that its leg 16^a will be out of engagement with the latch 12 and the leg 13^a of the double acting spring 13 will be permitted to press the latch 12 into latching position. When the gate is collapsed, therefore, during the stay of the car at the floor it will be releasably latched in such collapsed position.

When, however, the car leaves its proper position at the floor the action of the spring 20^a will cause the fork 17 to be so oscillated that the leg 16 will engage the rearward extension 15 of the latch 12, so as to move the nose of said latch 12 out of engagement with the hook 11 whereupon the gate will again become subject to the action of the spring 7 acting through the arms 4 and 5 and will be automatically extended into closed position, and the other leg 16 of said fork 17, being simultaneously moved out of engagement with the lock-plate 26, will permit the leg 13^b of the spring 13 to press the same beneath the extension 4^b of the arm 4 and again lock the gate.

It is frequently desirable in devices of the type hereinabove described to swing the gate or the like after the same is collapsed outwardly into what I have termed full-open position at a right angle to its normal path of travel, and it is furthermore desirable that a device when in this position should be automatically swung back into its normal path of travel and then automatically extended as above described.

In order to accomplish this result, I preferably, as aforesaid, divide the track 2 into sections 3^a and 3^b so that all the rollers of the gate when in collapsed position will be mounted on the track section 3^b, and I preferably pivot the stationary upright member 1^a at the rear edge of the gate at its upper and lower ends, as at 1^b—1^c and I mount on said pivoted member a spring 30 abutting at one side against a stop 31 and at the other side against a suitable bracket 32 secured to the building, the spring being so arranged as to force the pivoted member 1^a to turn on its pivots and swing the track section 3^b and the collapsed gate into a position in alinement with the section 3^a.

As illustrated my preferred mechanism for oscillating the fork 17 to simultaneously engage the lock-plate 26 and disengage the latch 12 and vice versa, comprises a slide 35 vertically movable upon the rear upright

member 1^a and provided with studs 35^a—35^b between which is arranged an extension 19 of the fork 17.

Obviously when the slide 35 is moved downwardly from the position shown in Fig. 5, the leg 16 will engage and move the locking plate 26 from beneath the extension 4^a of the lever 4 and such downward movement will also cause the leg 16^a of the fork to disengage the rearward extension of the latch 12 and permit it to be pressed into latching position by the leg 13^a of the spring 13, so that the latch 12 upon the collapsing of the gate will engage the hook 11 and latch the gate in such collapsed position. On the other hand, a movement of the slide 35 back to the position shown in Fig. 5 will cause the fork 17 to be rocked on its pivot so that its leg 16 will disengage the lock plate 26 so as to permit it to come under the influence of the leg 13^b of the spring 13, and such rocking of the fork will cause the leg 16^a of said fork to engage and move the latch 12 out of engagement with the hook 11 to permit the gate to be extended by the spring 7 and levers 4 and 5.

To retain the gate in full open position I provide a hook 50 on the outer side of the gate which engages a movable arm 39. This arm is rocked as hereinafter described and during such rocking will move out of engagement with the hook 50 whereupon the spring 30 will act to force the track sections into alinement.

In order to retain the gate in its latched collapsed position during the swinging of the same from its initial collapsed or folded position to full-open position, and to cause the gate to be unlatched and extended only when the track sections are in due alinement, I provide on the said slide a shelf 36 partially encircling the pivotal member 1^a and which is adapted when the fork 17 is in its lowermost position to swing beneath a fixed or stationary stud 37, said stud being formed integrally with a plate 38 secured to the wall of the building (see Fig. 3). Said shelf and stud are, as shown, provided with inclined abutting faces 36^a—37^a adapted to facilitate the movement of the shelf 36 beneath the fixed stud 37.

Suitable means actuated by the movement of the car to a predetermined position are employed for moving the slide 35 upwardly and downwardly to alternately engage and disengage the latch 12 and locking plate 26. For this purpose, I preferably provide a lever 39 pivoted at 40 on the plate 38 and having a loose connection at 41 with an angle lever 42 on which the stud 20 is mounted. It will be seen that the arm 42 and stud 20 are normally retained by the spring 20^a in the position shown in Fig. 2 and when the movement of the car 22 through the spring-pressed shoe 21 moves the stud 20 outwardly away from the wall against the action of said spring, as illustrated in Fig. 3, the angle lever 42 will be rocked on its pivot 42^a and the horizontal arm of said angle lever 42 (see Figs. 2, 3 and 5) will rock the lever 39 on its pivot 40, which by reason of its connection with the slide at 39^a where it extends between the shelf 36 and another shelf 36^a, move the slide 35 downwardly to rock the fork 17 to engage and push the lock-plate 26 out of the path of the extension 4^a of the lever 4 and disengage the latch 12 to permit it to be pressed into latching position.

It will be noted from the foregoing that I provide spring actuating means for normally releasing the gate latching devices and that I also employ a spring pressed contact shoe on the car. These spring pressed devices are so positioned and the springs are of such relative strength as first to take up and compensate for any lateral swinging of the car, and secondly, to act as a shock-absorbing medium between the contact shoe on the car and the operating mechanism for the gate.

Having described my invention, I claim:

1. In elevator gates and the like, the combination with a suitable folding closure, of means for normally forcing the closure into closed position; means for automatically locking the closure in closed position; means for latching the closure in folded position parallel to its normal path of travel; means for mounting the closure to swing pivotally from folded to full-open position at an angle to its normal path of movement; means for normally forcing the same back to said folded position; means for retaining the closure latching means in latching position during the pivotal swinging of the closure and means controlled by the movement of the elevator car for releasing said latching means to permit the closing and locking of the closure in closed position.

2. In elevator gates and the like, the combination with a suitable folding closure, of means for normally forcing the closure into closed position; means for automatically locking the closure in closed position; means for latching the closure in folded position parallel to its normal path of travel; means for mounting the closure to swing pivotally from folded to full-open position at an angle to its normal path of movement; means for normally forcing the same back to said folded position; means for retaining the closure latching means in latching position during the pivotal swinging of the closure; means for latching the closure in full-open position; means controlled by the movement of the car for releasing the last-mentioned latching means first; and means for automatically releasing the first-mentioned latching means when the closure is moved

to said folded position to permit the automatic closing and automatic locking of said closure.

3. In a gate controlling device for elevator gates and the like, the combination with a folding gate, of a track extending transverse the doorway and comprising a plurality of sections, one of such sections being adapted to entirely support the gate in folded position, means for mounting the said supporting track section to swing at an angle to its complementary section, means for normally forcing said two track sections into alinement, means for automatically moving the gate into closed position, means for automatically locking the gate in such closed position, and means carried by the car for releasing said gate locking means when the elevator car reaches a predetermined position.

4. In an elevator gate controlling device, the combination with a folding gate, of a track extending transverse the doorway and comprising a plurality of sections, one of such sections being stationary and the other movable pivotally in relation thereto, the movable section being adapted to entirely support the gate when in folded position, means for normally forcing said two track sections into alinement, means for automatically moving the gate into closed position, means for automatically locking the gate in such closed position, means carried by the car for releasing said gate locking means when the elevator car reaches a predetermined position, means for latching the gate in collapsed position and means for automatically releasing said latch when the elevator car moves beyond said predetermined position.

5. In a gate, the combination with a gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a helical contractile spring located at said intermediate connection, means supported solely on said levers for causing said spring to exert pressure to extend said levers, and means releasable by the movement of the elevator car to a predetermined position for automatically locking one of said levers in extended position to lock the gate.

6. In a gate, the combination with a collapsible gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a helical contractile spring located at said intermediate connection, guides mounted solely upon said levers for causing said spring to exert pressure on both of said levers, a spring pressed lock-plate engaging one of said levers for automatically locking the same in extended position and means actuated by the movement of the car for releasing said lock-plate to permit the gate to be collapsed.

7. In a gate, the combination with a collapsible gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a spring located at said intermediate connection, guides mounted solely upon said levers for causing said spring to exert a pulling force on said levers on opposite sides of said pivotal connection and a pushing force at said connection, a spring pressed lock-plate engaging one of said levers for automatically locking the same in extended position, means actuated by the movement of the car for releasing said lock-plate to permit the gate to be collapsed, means for latching the gate in collapsed position and automatic means actuated by the movement of the car for automatically releasing said latching means.

8. In a gate, the combination with a collapsible gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a spring located at said intermediate connection, means for causing said spring to exert pressure to extend said levers, a spring pressed lock-plate engaging one of said levers for automatically locking the same in extended position, means actuated by the movement of the car for releasing said lock-plate to permit the gate to be collapsed, means for latching the gate in collapsed position, means for normally releasing said latching means; means for mounting the gate to swing into full-open position and means for preventing the actuation of said releasing means during the swinging movement of the gate.

9. In a gate, the combination with a col-

lapsible gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a spring located at said intermediate connection, means for causing said spring to exert pressure to extend said levers, a spring pressed lock-plate engaging one of said levers for automatically locking the same in extended position, means actuated by the movement of the car for releasing said lock-plate to permit the gate to be collapsed, means for latching the gate in collapsed position, means for normally releasing said latching means; means for mounting the gate to swing into full-open position; means for preventing the actuation of said releasing means during the swinging movement of the gate; means for latching the gate in full-open position; means for normally releasing said last mentioned latching means and means on the car for preventing the actuation of said releasing means during the stay of the car in a predetermined position.

10. In a gate, the combination with a collapsible gate, of a pair of levers, one of which has a pivotal connection at one of its ends with a movable portion of the gate and the other has a pivotal connection at one of its ends with a relatively fixed point, the ends of said levers opposite to the aforesaid pivotal connections being so disposed as to abut against one another and to have an intermediate pivotal connection with each other, in combination with a spring located at said intermediate connection; means for causing said spring to exert pressure to extend said levers, a spring pressed lock-plate engaging one of said levers for automatically locking the same in extended position; means actuated by the movement of the car for releasing said lock-plate to permit the gate to be collapsed; means for latching the gate in collapsed position; means for normally releasing said latching means; means for mounting the gate to swing into full-open position; means for preventing the actuation of said releasing means during the swinging movement of the gate; means for latching the gate in full-open position; means for normally releasing said last-mentioned latching means and spring pressed means on the car for preventing the actuation of said releasing means during the stay of the car in a predetermined position.

In witness whereof, I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

RAFFORD PITT.

Witnesses:

WILLIAM R. PITT,

ELIZABETH G. BARRY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."