

E. S. MILLER.
ELEVATOR LOCK.
APPLICATION FILED SEPT. 7, 1918.

1,340,664.

Patented May 18, 1920.
3 SHEETS—SHEET 1.

FIG. 1.

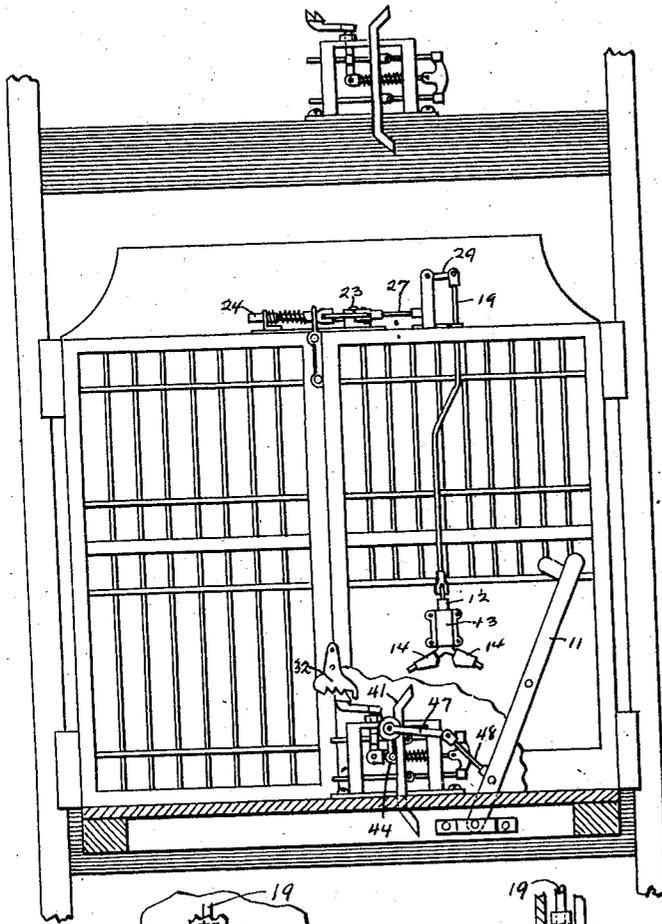


FIG. 2.

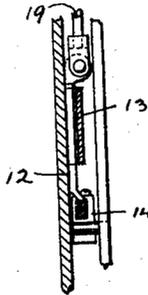
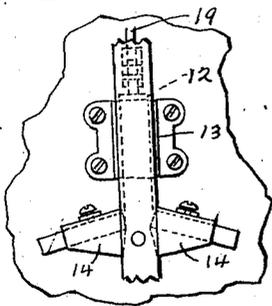


FIG. 3.

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FIG. 4.

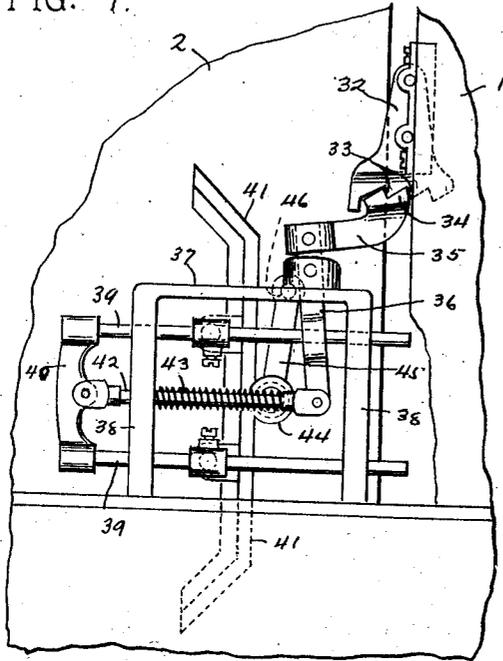


FIG. 5.

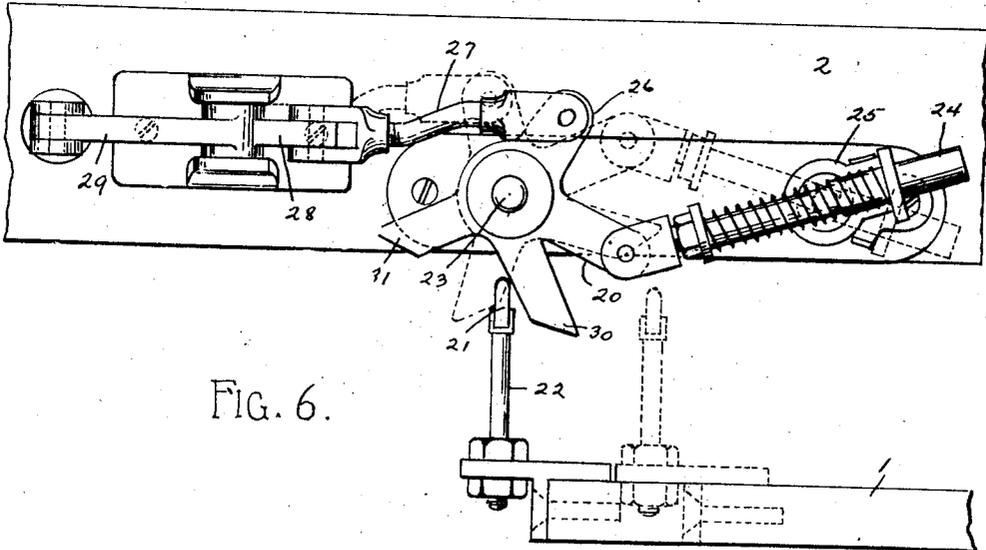
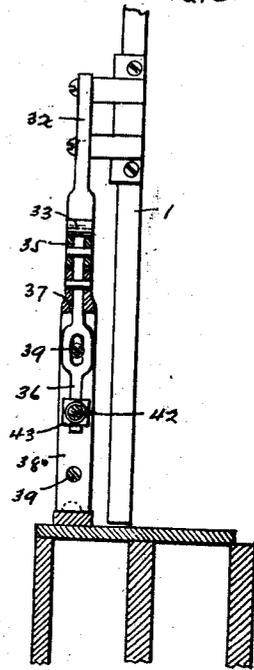


FIG. 6.

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3 SHEETS—SHEET 3.

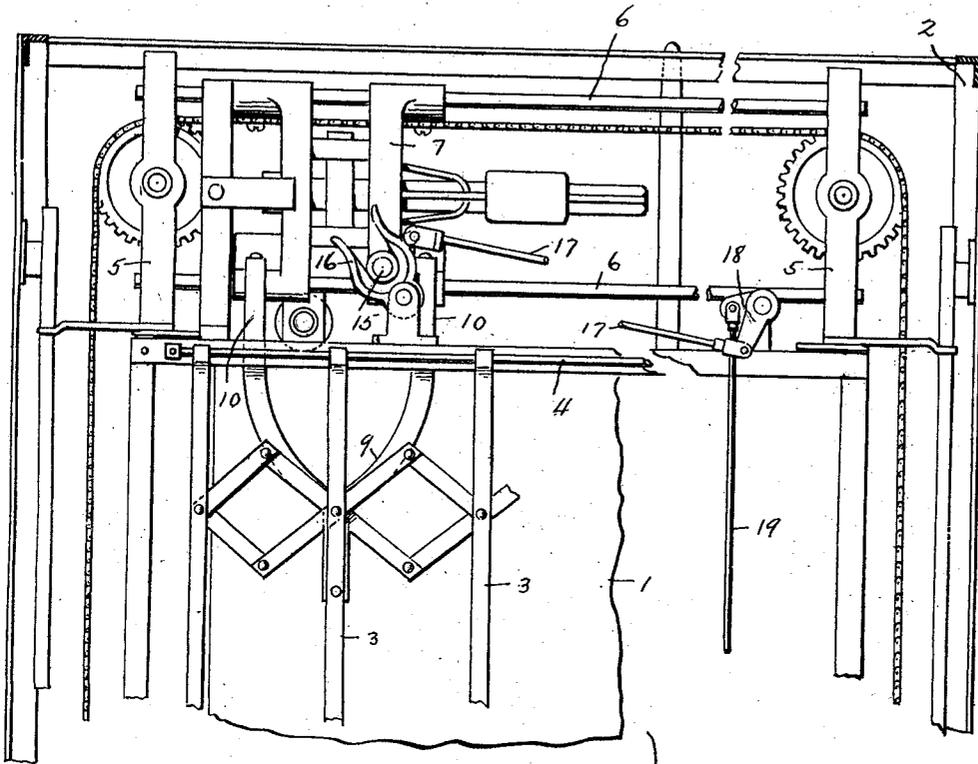
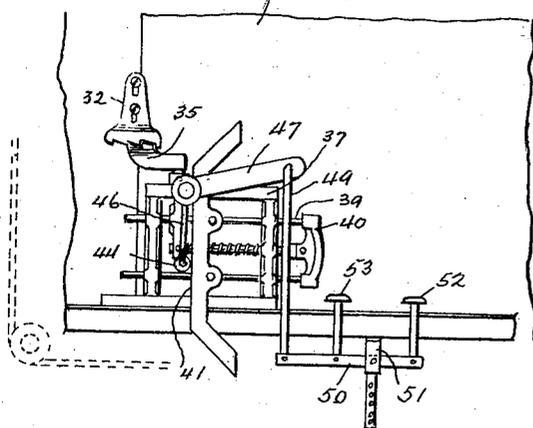


FIG. 7.



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UNITED STATES PATENT OFFICE.

EMMETT S. MILLER, OF CHICAGO, ILLINOIS.

ELEVATOR-LOCK.

1,340,664.

Specification of Letters Patent. Patented May 18, 1920.

Application filed September 7, 1918. Serial No. 253,086.

To all whom it may concern:

Be it known that I, EMMETT S. MILLER, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Elevator-Locks, of which the following is a specification.

My invention appertains to improvements in elevator locks and has special reference to mechanism for locking and releasing the doors upon elevator shafts and gates of elevator cars or cages, and the control or power lever within the cage. The present application was originally disclosed in my prior application for Letters Patent for improvements in mechanism for actuating and locking elevator doors that was filed December 3, 1917, Serial Number 205,120 and matured in U. S. Letters Patent Number 1,265,804, dated April 14, 1918.

Among the divers objects of my invention are the provision of mechanism adapted to lock the shaft door and cage gate of an elevator and to release the same only when the floor or platform of the cage has been brought to a stop within a safe level with respect to the floor at which a stop is made; and also the provision of devices actuated by the movement of the door and gate for locking and releasing the elevator control lever so that the control lever cannot be moved and the car started while said door and gate are opened or while said door and gate are opening or closing. Also in this connection I have provided adjustable locking jaws which are of advantage in preventing the creeping of a hydraulic elevator.

Further objects will be obvious to others after an understanding of my invention is had. I prefer to accomplish the divers objects by substantially the means and in the manner hereinafter fully described and as more particularly pointed out in the claims, reference being now had to the accompanying drawings forming a portion of this specification, and in which similar reference characters have been employed to designate the same parts throughout the divers figures.

In the drawings:

Figure 1 is an elevation of a cage equipped with my locking mechanism and capable of being manipulated manually by the power control lever of the cage, and illustrating the construction of lever lock.

Fig. 2 is a fragmental detail, slightly enlarged, of the lever lock.

Fig. 3 is a vertical sectional view thereof.

Fig. 4 is a detail elevation of the shaft door lock and release mechanism, drawn to an enlarged scale.

Fig. 5 is a vertical section thereof.

Fig. 6 is a top plan, further enlarged, of the power control lever locking mechanism mounted upon the top of the shaft doorway and showing two relative positions thereof.

Fig. 7 is a vertical elevation from the inside of the cage showing my devices applied thereto and to the shaft.

In the drawings, it will be seen the shaft is provided with the usual slidable door 1 at each floor and the cage 2 is provided with a collapsible gate 3, that is adapted to slide upon a track 4, positioned over the doorway of the cage. Mounted upon the ends of the front wall of the cage are uprights 5, 5, to which the ends of horizontally disposed parallel guide-rods 6, 6 are secured, that afford a track and support for a longitudinally reciprocable carriage 7, constructed in substantially the manner illustrated. Suitable provision is made upon the lower members of the carriage, for securing upper ends 10, 10 of a connecting yoke 9 to said carriage. This yoke is Y-shaped, as shown, and its elongated member extends downwardly a distance sufficient to permit it to be securely bolted to one of the bars comprising the collapsible gate, so that in the event of necessity arising to do so, the gate may be readily detached therefrom by a wrench or other tool and the gate opened independently of the mechanical operating means.

In order to prevent accident by the starting of the cage when the gate or door is opened, I have provided suitable means for automatically locking the power control hand lever 11, when in its neutral or vertical position, during the period of opening and closing the door and gate. This mechanism comprises an inverted Y-shaped bolt 12, the upper or vertical member whereof has an up and down movement in a guide strap 13, secured to the wall of the cage adjacent the power control hand lever 11, as shown in the drawings, and suitable locks 14, 14 are adjustably mounted upon the converging or lateral arms of the bolt in order that the device may be adjusted to accommodate itself to a control lever in a car of the hydraulic type, that may creep when the lever is moved and is resting in neutral. When the bolt is

in the position shown in the drawings, the control lever 11 is free to be moved in either direction upon its pivot, but when the gate is in the act of being opened or closed, motion is transmitted from the carriage 7 to the bolt through the engagement of a roller or projection 15 on said carriage, with the oscillatory U-shaped yoke 16 pivotally mounted at its bottom upon lugs on the top of the cage and said yoke is connected by a rod 17 to one of the arms of a suitable bell-crank 18, which latter has its other arm connected by a vertical rod 19 to the upper end of the bolt 12.

Another type of mechanism for raising the control lever locking bolt 12 is also illustrated in Figs. 1 and 6, wherein it will be noted that the same is actuated by the movement of the shaft door, that carries a vertical runner 21 upon the outer ends of arms or posts 22, projecting into the shaft from one of the vertical edges of the door. A horizontally disposed bell-crank is pivoted upon a stud 23 on the top of the cage 2 and has its arm 20 connected to the adjacent end of spring-pressed plunger 24, that has its opposite end supported in a swivel-bearing 25, while the other arm 26 of the bell-crank is connected by a link 27 to the adjacent arm 28 of a vertically disposed bell-crank also carried by the cage. The vertical rod 19 has its upper portion extended without the cage, where its end is connected to the arm 29 of the vertical bell-crank, so that a slight turn of the horizontally disposed bell-crank will raise or lower the bolt 12 to release or lock the control lever 11 in the cage. This movement is accomplished by providing the horizontal bell-crank with a pair of projections 30 and 31, that are adapted to be engaged by the vertical runner 21 on the shaft door whenever the latter is moved to begin the opening or to finish the closing movement, and in either event, the arm 20 will have been moved past the "dead-center" of its pivot 23 and the swivel 25 of the plunger thereby causing the parts to snap into one position or the other, according to the direction in which the door 1 is being moved.

In apparatus of this character, as is well known, it is desirable to provide devices for locking and releasing the shaft doors automatically when the elevator cage has been stopped at a safe landing in front of the shaft door, and for this purpose I have designed the two structures illustrated, wherein the locking mechanism is released automatically, and wherein the locking mechanism is released manually by the movement of the elevator control lever 11, both types comprising the same general structure that is actuated by different means. The shaft door 1 is provided adjacent its inner vertical edge with a vertically disposed substan-

tially T-shaped bracket 32, the lower horizontal edge whereof is provided with large teeth or serrations 33, that are adapted to be engaged by the teeth 34 upon the adjacent end of an arm 35, projecting laterally from the upper portion of a lever 36, pivoted upon the upper horizontal member 37 of a U-shaped frame mounted upon and arising from the floor of the landing and located outside the vertical front wall of the cage so that the latter will clear it. The vertical members 38 of said frame are provided with alining transverse bearings, in which a pair of horizontally disposed parallel rods 39, 39, are adapted to reciprocate simultaneously by reason of their outer ends being connected by a cross-piece 40. Said rods 39 are also connected to each other intermediate their bearings by a vertically disposed strike bar or track 41, the purpose of which will hereinafter more fully appear. A suitable pitman 42 is pivotally connected at one end to the lower portion of the lever 36, and its opposite end is similarly connected to the cross-piece 40 intermediate said rods 39, and a helical expansion spring surrounds said pitman between one of the upright members 38, and the lower end of the lever 36, in order to retain the arm 35 in engagement with the bracket 32. The strike bar 41 is disposed so that it is positioned in the elevator shaft beyond the vertical plane of the floors, sufficiently to be engaged by a roller 44, carried by the lower end of a substantially vertical arm 45, that is adjustably secured upon the extended end of a short rock-shaft 46, journaled in the outer wall of the elevator cage 2. The rock-shaft 46 is rotated by the movement of the control lever 11, to which it is connected by toggle links 47 and 48, the former of which is adjustably secured to the inner extended end of said rock-shaft. However, when it is desirable to actuate the locking mechanism by separate manually operated means the free end of link 47 is connected to the upper end of a vertically disposed rod 49, that has its lower end connected below the floor or platform of the cage to the adjacent portion of a horizontally disposed T-shaped walking-beam 50. This walking-beam is pivoted intermediate its ends to a supporting bracket 51, bolted to the underside of the floor of the cage, and is actuated by depressing foot plungers 52 and 53 that are connected thereto and extend through the floor of the cage within convenient reach of the conductor or elevator operator.

What I claim is:—

In control mechanism for elevators, a shaft door, a serrated latch member mounted thereon, a suitable frame mounted on the shaft, a lever pivoted on said frame having a depressible extension a portion

whereof is serrated and coacts with said
latch member when the latter is closed, par-
allel rods slidably mounted in said frame
and connected to move in unison, a yielding
5 plunger intermediate said rods and con-
nected thereto, one end of said plunger piv-
otally connected to said lever, a vertically
disposed striker track adjustably mounted
upon and movable with said parallel rods,
10 in combination with means mounted upon
the elevator cage for actuating said devices
consisting of a third-class lever the free end
whereof is normally out of the plane of said
striker-track, a rock-shaft upon which said

lever is mounted, and devices within the ele- 15
vator cage for actuating said rock-shaft
whereby the movable end of said lever is
moved beyond the plane of the striker-
track to actuate the same and release the
door by depressing the extension on said 20
first-mentioned lever.

Signed at Chicago, county of Cook and
State of Illinois, this 26th day of August,
1918.

EMMETT S. MILLER.

Witnesses:

E. K. LUNDY, Jr.,
H. SLACK.