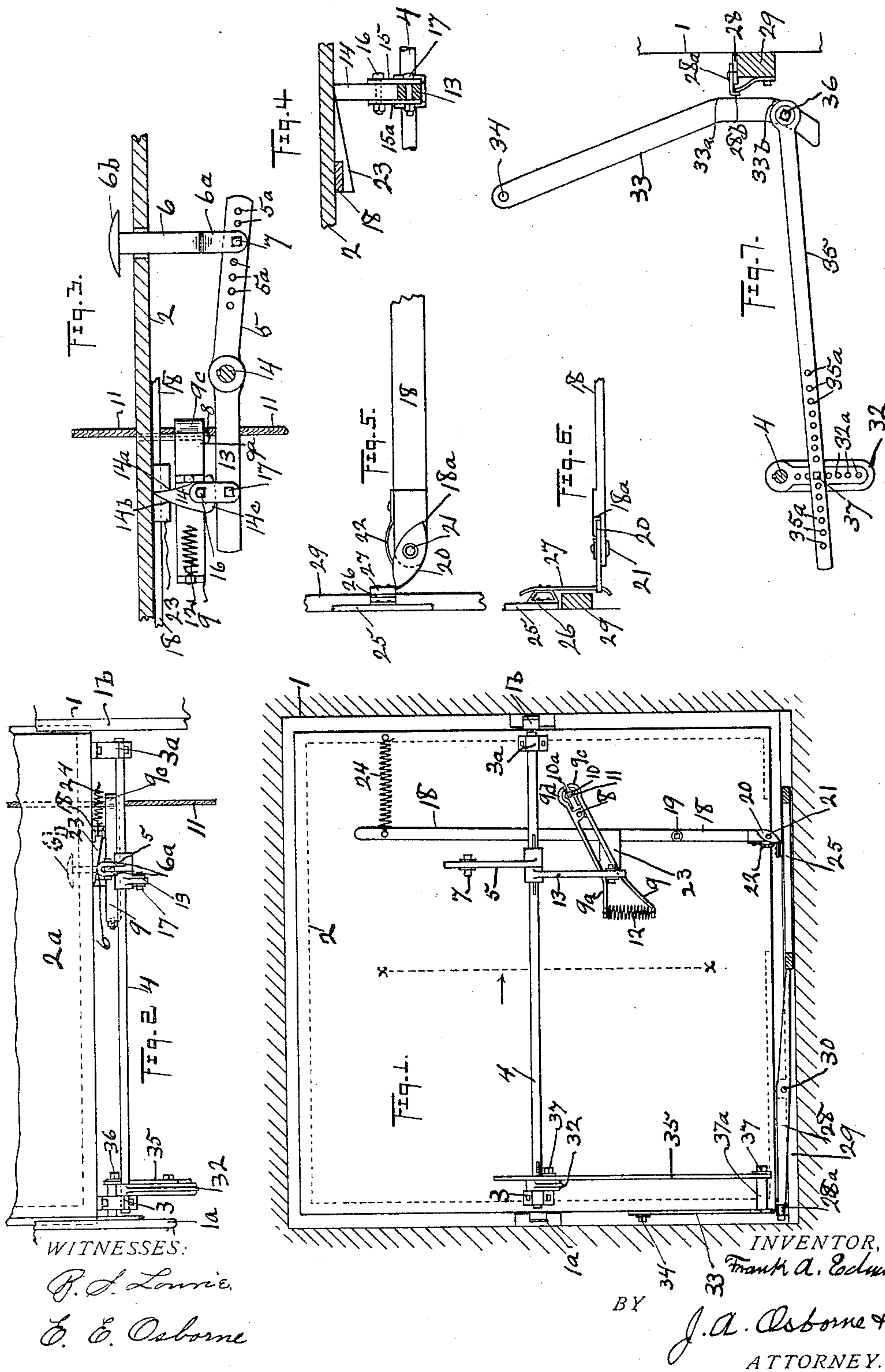


(No Model.)

F. A. EDMONDS.
ELEVATOR SAFETY LOCK.

No. 581,704.

Patented May 4, 1897.



UNITED STATES PATENT OFFICE.

FRANK A. EDMONDS, OF CLEVELAND, OHIO.

ELEVATOR SAFETY-LOCK.

SPECIFICATION forming part of Letters Patent No. 581,704, dated May 4, 1897.

Application filed December 10, 1896. Serial No. 615,187. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. EDMONDS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Elevator Safety-Locks, of which the following, with the accompanying drawings, is a full, clear, and exact specification.

10 The object of my invention is a locking device that will hold the car or carriage of an elevator immovable and secure and beyond the control of the person operating the same while any gate or door used for entrance
15 thereto and exit therefrom shall be open or unsecured, and that will prevent any such gate or door from being opened while the car or carriage of the elevator shall be in motion or be not opposite the floor or landing on
20 which such gate or door is located.

My invention consists in the combination of parts as defined in the claims, to which reference is made for a detailed statement of my invention.

25 The drawings represent one application and arrangement of my invention as applied to an elevator.

Figure 1 illustrates an inverted plan of the said application and arrangement. Fig. 2
30 illustrates a side elevation of the same. Fig. 3 is an enlarged section on the line $x x$ of Fig. 1. Fig. 4 is an enlarged elevation of the locking and disengaging wedges and illustrates their relations to each other and their
35 connections. Fig. 5 is an enlarged plan of a broken section of the lever 18, with its pivoted toe and the gate-trip; and Fig. 6 is a side elevation of the same. Fig. 7 is an enlarged elevation of the levers that operate
40 the pivoted door-lock.

In all the figures of the drawings like reference-characters refer to like parts.

1 represents the elevator shaft, and 1^a and 1^b are the elevator-guides at the sides of the
45 shaft.

2 is the floor of the elevator-car 2^a . Journalled in hangers $3 3^a$, attached to the under side of the car-floor, is a rock-shaft 4. Fixed to the rock-shaft 4 is a lever 5, to which is
50 pivoted a pedal 6, that projects vertically through the car-floor. The series of holes 5^a

in the lever 5, through which the bolt 7 passes to connect the lower yoked end 6^a of the pedal with said lever, provides for the proper placement of the pedal to go straight up through
55 the perforation in the elevator-floor above, through said lever adapted to receive the bolt 7, that passes through the lower yoked end 6^a of the trip, and through the said holes 5^a . The lever 5 is fixed at such place upon the
60 rock-shaft 5 as will bring the pedal in convenient proximity to the operator's cable. The adjustment of the pedal on the lever 5 is designed to aid in the more convenient placement of the pedal for the operator. The
65 pedal 6 has a suitable head 6^b thereon, upon which the operator may place his foot to depress the pedal to lock the operator's cable against movement.

To the under side of the car-floor is pivoted
70 a cable-clamp by means of a pivot 8. This clamp consists of two jaws $9 9^a$, that turn on the pivot 8. The gripping ends of the jaws are curved, as at $9^c 9^d$, and have fitted therein by any convenient means removable bush-
75 ings $10 10^a$. These bushings are curved like the ends of the jaws of the clamp to approximately conform to the operator's cable 11 and clamp it firmly, and they are made of rubber or other suitable material that will allow a
80 tight grip upon the cable. The bushings are removable in order that when worn they may be replaced with new ones. The outer or lever ends of the jaws of the cable-clamp are connected by a spring 12, to spread the grip-
85 ing ends $9^c 9^d$ of the jaws and keep the clamp clear of the cable when not locked thereon. Upon the rock-shaft 4 is fixed a lever 13. A lock-wedge 14 has a double pivotal connection with the lever 13 by means of links 15
90 15^a and the pivot-bolts 16 and 17, that connect the said links with the lock-wedge and the said lever, respectively. Said lock-wedge 14 in operation has a slight movement longitudinally of the lever 13 by means of the
95 links $15 15^a$ and the pivot 17, and it has a slight rocking movement on the pivot 16. This double pivoted connection is made to accommodate the wedge to the inner faces of the lever ends of the jaws of the clamp as it
100 is forced upwardly between them to clamp the cable 11. The sides $14^a 14^b$ of the wedge

approach each other in slightly-curved lines to facilitate the movement of the wedge between the jaws of the clamp as the wedge moves in an arc, and the wedge is rounded on its bottom 14° to further facilitate its movement described above.

When the car is stopped with its floor approximately opposite any landing, the operator's cable is locked against movement by the operator's stepping upon the top 6^b of the lever 6. This depresses the outer end of the lever 5, rocks the shaft 4, throws up the outer end of the lever 13, and forces the lock-wedge 14 upwardly between the lever ends of the jaws 9 9^a of the clamp. As the lever ends of the clamp-jaws are spread by the upward movement of the lock-wedge 14 the jaws turn on their pivot 8 and clamp the cable 11 between the bushed gripping ends 9^c 9^d. This clamp when closed upon the cable will hold the elevator-car immovable and secure and beyond the control of the operator while the door opposite the elevator is open, as it is only by opening and closing the door to the landing that the clamp can be released and the operating-cable placed in control of the operator.

The clamp when locked upon the operator's cable is automatically released therefrom by closing the landing-door opposite the elevator-car. To the under side of the car-floor is pivoted the lever 18 by means of a bolt 19. Upon the end of the lever next to the gate is pivoted a toe 20 by means of a pivot 21. In the direction of the closing of the landing-gate the movement of the pivoted toe is limited by the shoulder 18^a. The pivoted toe has a movement oppositely, however, against the spring 22, that is fixed to one side of the lever. Fixed to the lever 18 or made integral therewith is a releasing-wedge 23, having its inclined face downwardly. This releasing-wedge as the lever 18 is turned by the closing of the gate travels over the locking-wedge 14 and forces said wedge downwardly, so that it will free the jaws of the clamp and release the clamp from the cable. A spring 24, having one end fixed to the end of the lever 18 opposite the pivoted toe and its other end fixed to the bottom of the car-floor, as illustrated, serves to return said lever 18 and the releasing-wedge to their normal position, after the elevator-car leaves a landing-gate just closed, to allow the locking-wedge to again operate. Each landing-gate 25 carries a trip 27, that is fixed to a bracket 26, which in turn is attached to the gate.

The gate is of the usual sliding form. The ends of the trip are bent outwardly to avoid their engaging any part of the car in its travels. In closing the gate the trip carried thereby will engage the pivoted toe of the lever 18, throw the wedge over, and lower the locking-wedge to release the grip of the clamp on the cable, as described. When opening the gate, the pivoted toe will turn

as the trip comes into contact with it, which allows the said trip to pass the toe. The spring 22, after the trip passes the pivoted toe, throws the toe back into position to be engaged by the trip when closing the gate to release the operating-cable.

Operating in conjunction with the foregoing mechanism to prevent any gate from being opened while the elevator-car is away from the landing at which such gate is located I have provided a simple lock for the door, which lock is automatically opened by the cable-locking mechanism when the operator places his foot upon the pedal and the lock is automatically locked to hold the door closed when releasing the cable-clamp. This mechanism prevents any landing-door from being opened while the car is in motion or while the car is not opposite the floor or landing at which the gate is located.

A door-lock lever 28 is centrally pivoted to the floor-beam 29 on each floor or landing by a pin or otherwise, as at 30. This lever is placed just inside the line of travel of the gate 25, so that when locked the end of the lever next to the door will engage the edge of the door, as illustrated, Fig. 1, and lock the door closed. Upon the opposite end of the pivoted door-lock lever is a lug 28^a, having a downwardly-turned lip 28^b. Attached to the side of the floor-beam 29 is a flat spring 31, whose free end engages the lip 28^b of the lug 28^a. This spring keeps the pivoted door-lock lever normally in the locked position described. Fixed upon the rock-shaft 4 near one side of the car is an arm 32. A swinging lever 33, pivoted to the outer side of the elevator-car at 34, is connected with the arm 32 by the link 35. The swinging lever 33 and the link 35 are pivotally connected by a bolt or pin 36, and the link 35 and the arm 32 are pivotally connected by a pin or bolt 37. The arm 32 and the link 35 are adjustable relatively to each other by means of the holes 32^a and 35^a. When the operator places his foot upon the pedal 6 to lock the cable 11, the rock-shaft 4 throws the arm 32, which through the lever 35 forces the swinging lever 33 against the lug 28^a on the door-lock lever 28, thus turning said lever on its pivot and clearing it of the door. When the door-lock lever is in this position, this lock is open and the door may be opened. This lock is placed inside the elevator-casing out of reach of persons on the floor, and is unlocked only by the swinging lever 33, operated as described. It will be seen that by this arrangement a door cannot be opened except when the car is at its floor, and also that the door cannot then be opened without locking the operating-cable and holding the car immovable, and, further, that the cable cannot be released and set in motion without closing the gate.

As the swinging lever 33 travels with the car, it is made straight vertically at that part that engages the lug on the door-lock 33^a to 33^b, and inclines inwardly above and below the

vertical plane to prevent the lever from engaging any part of the elevator-shaft while moving up or down therein.

The different parts of my device may be arranged and adjusted to the requirements of the elevator on which it is placed, and it may take on various modifications and changes without departing from the spirit of my invention. I do not, therefore, limit my claims to the detailed description herein given.

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

1. The combination, with the car and the operator's cable of an elevator, of a cable-clamp, a wedge for operating said clamp, a pedal, connections between said pedal and wedge, a landing-gate, connection between the landing-gate and the wedge whereby the clamp is released by the closing of the gate, a gate-lock, and connection between the pedal and said gate-lock whereby the gate-lock is opened simultaneously with locking the cable-lock, substantially as described.

2. The combination, with the car and the operator's cable of an elevator, of a clamp, a wedge for operating said clamp, a pedal, connections between the pedal and said wedge, a landing-gate, and connection between the landing-gate and said wedge whereby the clamp is released from the cable by the closing of the gate, substantially as described.

3. The combination, with the car and the operator's cable of an elevator, of a rock-shaft, a lever fixed thereto, a pedal connected with the lever, a clamp, a wedge to lock said clamp on the cable, and a lever fixed to the rock-shaft, said lever carrying said wedge, substantially as described.

4. The combination, with the car and the operator's cable of an elevator, of a rock-shaft, a lever fixed thereto, a pedal connected with the lever, a clamp, a wedge to lock said clamp, a lever fixed to the rock-shaft and carrying said wedge, a gate, and connection between the gate and said lock-wedge whereby the clamp is released from the cable by the closing of the gate, substantially as described.

5. The combination, with the car and the operator's cable of an elevator, of a lock for the cable, a pedal to operate said lock, a gate,

a trip carried by the gate, and a pivoted lever through which the lock is released from the cable by the engagement of said trip with the pivoted lever, substantially as described.

6. The combination, with the car and the operator's cable of an elevator, of a rock-shaft, a lever fixed thereto, a pedal connected with the lever, a clamp, a wedge to close the clamp on the cable, a lever fixed to the rock-shaft and carrying said wedge, a gate, a releasing-trip carried by the gate, and a pivoted lever carrying a wedge to disengage the first-named wedge from the clamp when the trip on the gate is brought into contact with said pivoted lever by closing the gate, substantially as described.

7. The combination, with the car and the operator's cable of an elevator, of a lock for the cable, and means consisting of a trip, and a pivoted lever having a toe pivoted thereto for releasing said lock from the cable by the engagement of said trip with the pivoted toe of the pivoted lever, substantially as described.

8. The combination, with an elevator-car and a landing-gate, of a pivoted lever that engages the landing-gate when closed and serves as a lock therefor, a spring to hold said pivoted lever in position to lock the landing-gate when the gate is closed, a pedal on the car, and connection between the pedal and the pivoted lever for operating the same to unlock the door, substantially as described.

9. The combination, with an elevator-car and a landing-gate, of a spring-pressed locking-lever adapted to engage the landing-gate when closed, a swinging lever adapted to be thrown into engagement with the locking-lever to disengage it from said gate, a rock-shaft, connection between the rock-shaft and the swinging lever, and a pedal to operate the rock-shaft, substantially as described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 5th day of December, 1896.

FRANK A. EDMONDS.

Witnesses:

J. A. OSBORNE,
JOHN ESSAN.