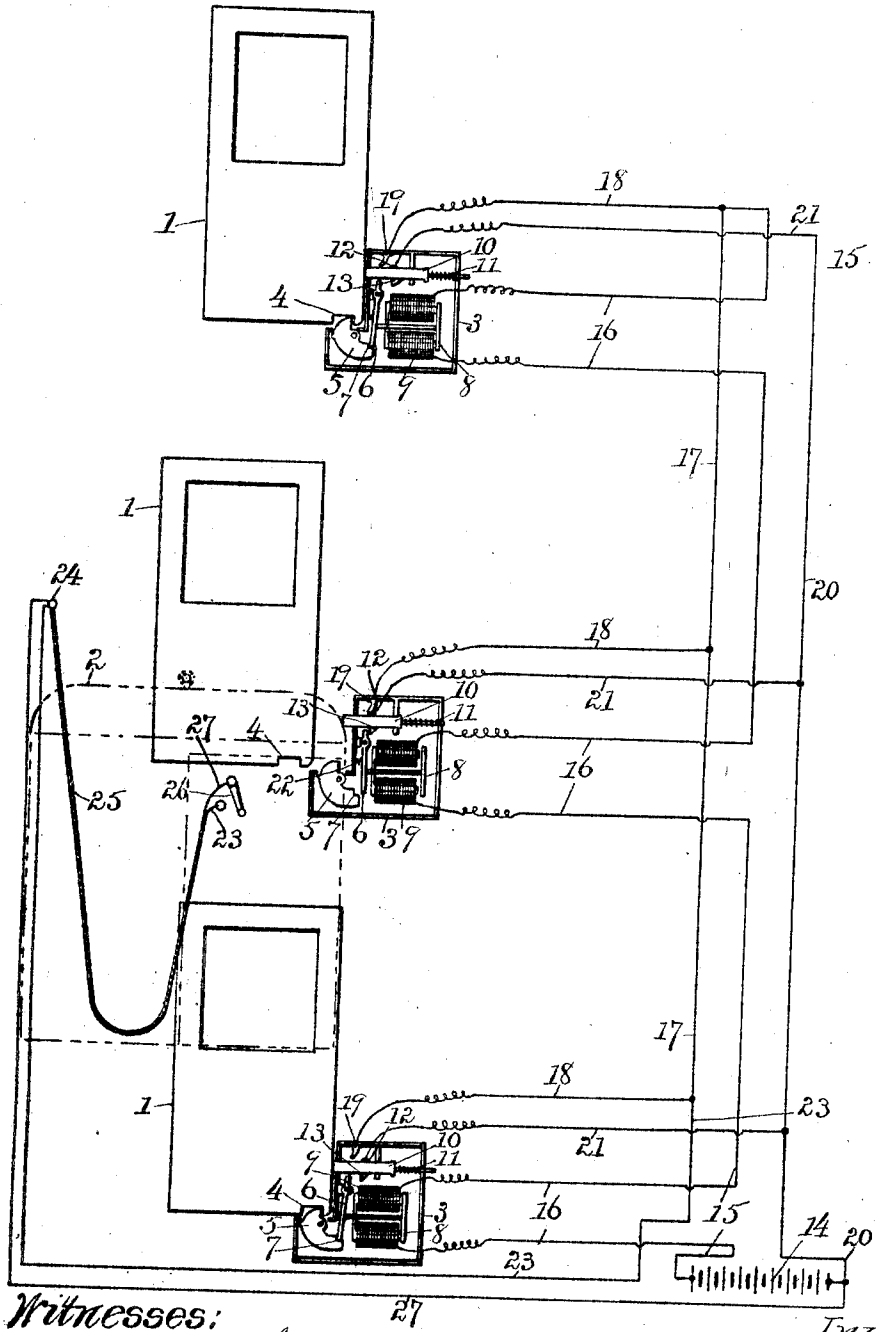
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LOCK FOR ELEVATOR DOORS.

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1,009,774.

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PHILIP MONTGOMERY, OF HARTFORD, CONNECTICUT.

LOCK FOR ELEVATOR-DOORS.

1,009,774. Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed June 24, 1905. Serial No. 266,861.

To all whom it may concern:

Be it known that I, PHILIP MONTGOMERY, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Lock for Elevator-Doors, of which the following is a specification.

My improvement relates more especially to elevators designed for use without an attendant, and the object of my invention is to provide a device for allowing access to an elevator car and its stopping and starting devices at all times and from all places except when the car is in use, and consequently to prevent access thereto by others than the user, and a further object of the invention is to provide a device in which the doors located at each landing may be freely operated without regard to the position of the elevator. A form of device in the use of which these objects may be attained is illustrated in the accompanying drawing, in which the figure is a diagrammatic view illustrating the arrangement of the parts, the locks appurtenant to the several doors being shown in relatively increased proportions.

Prior to my invention many forms of devices have been employed for insuring safety in the use of elevators, and particularly those elevators in which no attendant is employed for operating the device, as in private residences, in freight elevators, in stores, warehouses and the like, and in other places. An objection is present in such devices, however, from the fact that they are generally complicated, and the locks of the doors are operated or depend upon the position of the elevator. It is desirable in elevators of this class that the person using the elevator may freely operate the doors without respect to the position of the elevator car, and that the operation of the doors from within the car shall be unhampered. By the use of my improved elevator lock I have provided such a structure and at the same time provided means whereby when once a person has opened an elevator door all the other doors appurtenant to the well are automatically locked and the person thus using the elevator has full control of all of the doors to prevent the opening thereof and consequent use of the device by other persons.

My invention may be termed a conveyer, including a well, car, etc., and in the accompanying drawing the numeral 1 denotes the doors appurtenant to the openings of an elevator well, the latter, however, not being shown as the invention will be thoroughly understood without such showing.

The numeral 2 indicates the elevator car or conveyer, shown in dotted outline only.

The numeral 3 denotes the case of an elevator lock, one of these locks being appurtenant to each of the elevator doors. These locks are located within the elevator well so that access can be gained thereto only through an elevator door.

Each of the doors is provided with a recess 4 in which one end of a latch 5 may be located. This latch is pivoted within the case 3 and its end is so shaped that the edge of the door striking the curved surface will force the latch downward, and as soon as the door is closed the latch, owing to the position of the pivot and the balance of weight being located below said pivot, will resume its position with the end in the recess 4. A locking lever 6 is pivoted within the casing, its lower end lying in position to engage a notch 7 on the latch 5. This locking lever is connected with the armature 8 of an electro-magnet 9.

A contact bearer 10 is movably located within the case 3, a spring 11 tending to force the bearer normally toward the door 1. The end of this bearer projects through the casing 3 and rests against the edge of the door 1. This bearer has a contact 12 secured thereto and also a stop 13 which may be located in the path of movement of the upper end of the lever 6 to prevent the operation of said lever to hold the latch, under certain conditions, when the magnet is energized.

A battery 14 is employ d for supplying current to the circuits for oper..ting the locks. A circuit 15 leads from the battery and from this circuit branches or loops 16 extend in series through the magnets 9. This circuit may be arranged in any desired manner, but I have shown it herein as extending from the battery through the magnets to the top of the elevator well and thence returning to the bottom thereof by a return portion 17. Branches 18 extend from this return portion to the stationary contacts 19 located within the lock cases at each of the elevator doors. The return portion 17 of the circuit terminates at the point of connection of the branch 18 appurtenant

to the lowermost lock. A circuit 20 connects with the opposite pole of the battery from that of the circuit 15, and branches 21 extend from this circuit to the movable contact 12 on the bearer 10 appurtenant to each of the doors of the elevator.

The operation of that part of the device thus far described is as follows: The doors being all closed it will be noted that the circuit is broken at each of the contacts 19, and each of the levers 6 is located with its lower end out of the path of movement of the lower end of a latch 5 and disengaged from the notch 7 therein. A spring 22 may be employed to insure this disengagement of the lever. It being assumed that a person on the middle floor wishes to use the elevator car, the middle door is opened, as shown in the drawing, so that free access may be obtained to the shipper or hand-rope which is wholly located within the well passing through the elevator car. This opening of the middle door causes the bearer 10 to move outward under the influence of the spring 11, bringing the movable contact 12 against the stationary contact 19, thus closing the circuit. This energizes the magnets appurtenant to each door, and the armatures 8 are thus drawn to the magnet moving the levers 6 into the path of movement of the latches 5 so that said latches can not be moved. It will thus be seen that each of the doors is securely locked against opening. As the bearer 10 appurtenant to the middle door, however, is moved the stop 13 thereon is brought into the path of movement of the upper end of the lever 6, so that the armatures 8 of the magnet appurtenant to the middle door can not be moved, and the latch 5 of this door is therefore free. The shipper rope may now be operated to bring the elevator car to the middle floor, and the person stepping into the car may shut the door either before or after the elevator car is started, this shutting movement being unrestricted by the car. The current, as the middle door is opened, travels through the circuit 15, branches 16 to and from the magnets, through the return 17 to the branch 18 appurtenant to this middle door, thence through the stationary contact 19, removable contact 12, the branch 21 leading therefrom to the circuit 20 connected with one pole of the battery.

In order that the person using the elevator may still control the access to the doors while the elevator car is in use by him an elevator circuit is provided. This consists of a circuit 23 extending from the point of termination of the circuit 17 at its union with the branch 18 appurtenant to the lowermost door to the point 24 that is located within the elevator well. From this point it extends through the cable 25 to a switch 26 located within the elevator car. From this switch a circuit 27 extends backward through the cable 25 to the point 24 and thence to that pole of the battery opposite that connected with the circuit 15. In the operation of the device with this attachment, when the middle door above described has been opened, and the elevator car brought to the middle floor, as the person steps within the car the switch 26 is closed. When the middle door is then closed it will be noted that the circuit, although broken at the contacts 12 and 19 by the closing of this door, is still maintainel by the closing of the switch, the current passing through the circuit 15, magnets and branches 16, circuits 17 and 23 to the switch 26 and thence through the circuit 27 to the opposite pole of the battery from that at which the circuit 15 is connected.

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

1. Doors for controlling access to the stopping and starting means of an elevator car, a lock for each of said doors, and electrical connections between said locks for controlling their operation only in the movement of one of said doors.

2. Doors for controlling access to the stopping and starting means of an elevator car, a lock for each of said doors, and electrical connections between said locks to operate all of the locks to lock the doors only upon the opening of one of said doors.

3. Doors for controlling the access to the stopping and starting means of an elevator car, a lock for each of said doors, electrical connections between said locks for operating each of the locks to lock the doors only upon the opening of one door, and means for preventing operation of the lock of the opened door.

4. Doors for controlling access to the stopping and starting means of an elevator car, electrically controlled locks for each of said doors, and means for operating said locks to lock all of the doors only upon the opening of a single door.

5. Doors for controlling access to the stopping and starting means of an elevator car, a lock for each of the doors, electrical devices for locking the doors through the operation of an electrical circuit, and means for making or breaking said circuit only upon the opening of one of the doors.

6. Doors for controlling access to the stopping and starting means of an elevator car, a lock for each of said doors, electrically controlled means for locking all of the closed doors through the operation of an electric circuit, and connections to complete said circuit only upon the opening of a single door.

7. Doors for controlling the access to the stopping and starting means of an elevator car, a lock for each of said doors, electrical

devices for locking the closed doors upon the closing of an electric circuit, and means for closing said circuit only on the opening of a door.

8. Doors for controlling the access to the stopping and starting means of an elevator car, a lock for each of the doors, electrical means for operating each of said locks to lock the doors upon the closing of an electric circuit, means for closing said circuit only upon the opening of a door, and means for preventing operation of the lock appurtenant to the open door.

9. Doors controlling access to the stopping and starting means of an elevator car, the car, a lock for each of said doors, electrically controlled means for operating the locks to lock said doors, connections between said locks for operating the circuit only upon the opening of a door, and a circuit closer located within the car to continue the operation of the circuit after a door has been closed.

10. Doors for controlling access to the stopping and starting means of an elevator car, the car, a lock for each of said doors, electrically controlled devices for operating the locks, said doors being normally unlocked, connections for operating the locks to lock all of the closed doors only upon the opening of a door, and a circuit closer located within the car to continue the operation of the locking means after a door has been closed.

11. Doors for controlling access to the stopping and starting means of an elevator car, the car, a lock for each of said doors, electrical devices for operating the locks, said doors being normally unlocked, means for locking all of the closed doors upon the opening of a door, means for preventing operation of the lock appurtenant to the opened door, and a circuit closer within the car for continuing the operation of the mechanism to lock the doors.

12. The combination with a conveyer well provided with openings, of doors for said openings, and means electrically actuated by a movement of one door for locking another door in a fixed position.

13. The combination with a conveyer well, provided with openings, of doors for said openings, and means electrically actuated by moving one of said doors for locking the others in fixed position.

14. The combination with a conveyer well provided with openings, of doors for said openings, and means electrically actuated by the opening of any one door for locking the others and for unlocking the same upon the closing of said opened door.

15. The combination with a conveyer well, of a series of openings along the travel of the conveyer, doors for said openings, and means electrically actuated by a movement of one door and for locking another door.

16. The combination with a conveyer well provided with openings, of doors for said openings, and means electrically operated by the opening of any one door for locking the others and for automatically unlocking the same upon the closing of said opened door.

17. In a device of the character described, the combination of a shaft, a pair of sliding doors, a pair of movable locking members one for each of the doors and means connected with the locking members and organized to cause the opening movement of either door to position the locking member for the other door to prevent the opening of the latter door, and the closing movement of either door to release the locking member for the other door permitting such latter door to be opened.

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