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DOOR LOCK FOR ELEVATOR SHAFTS.

APPLICATION FILED FEB. 2, 1903.

NO MODEL.

Fig. 1

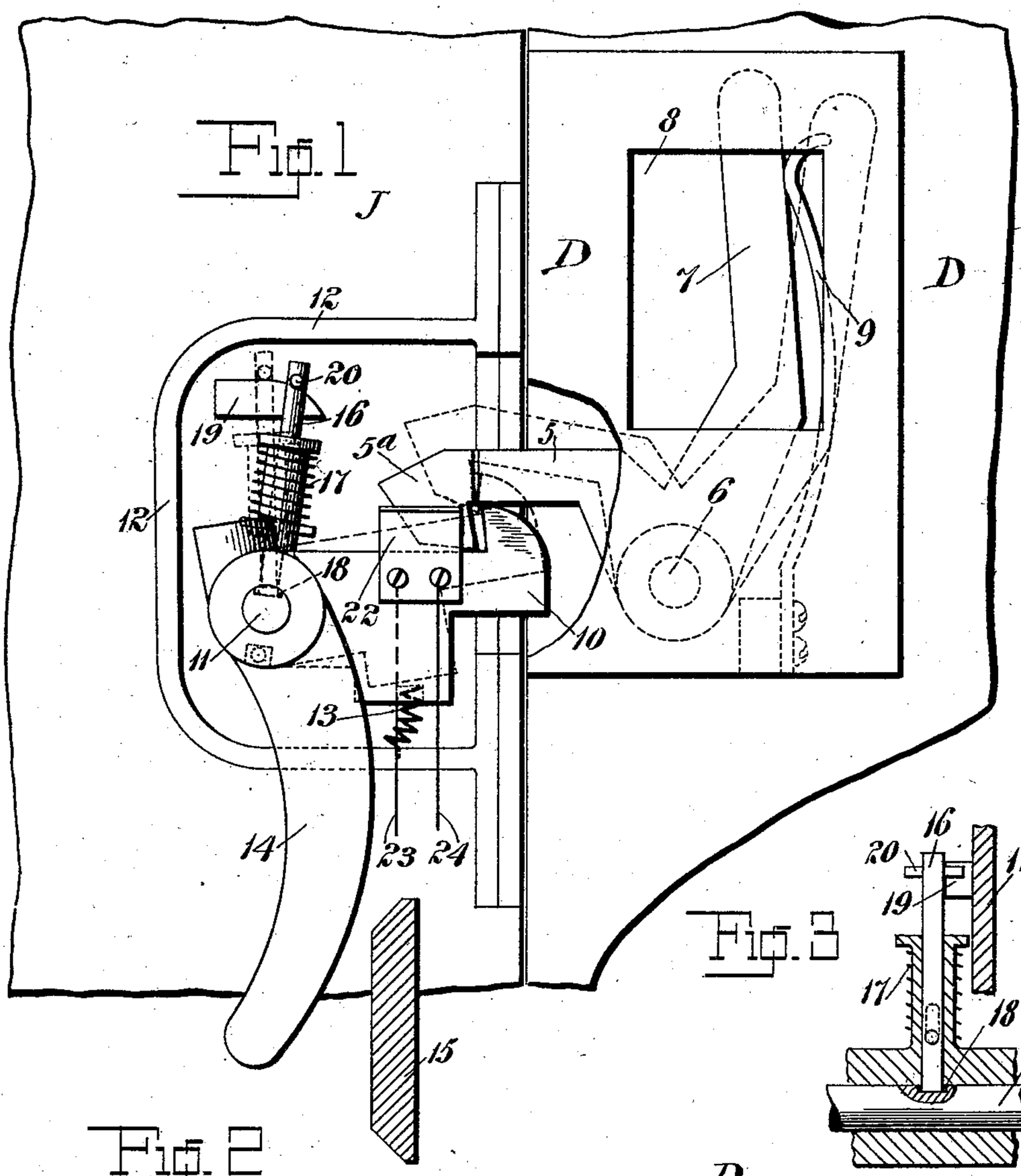


Fig. 3

Fig. 2

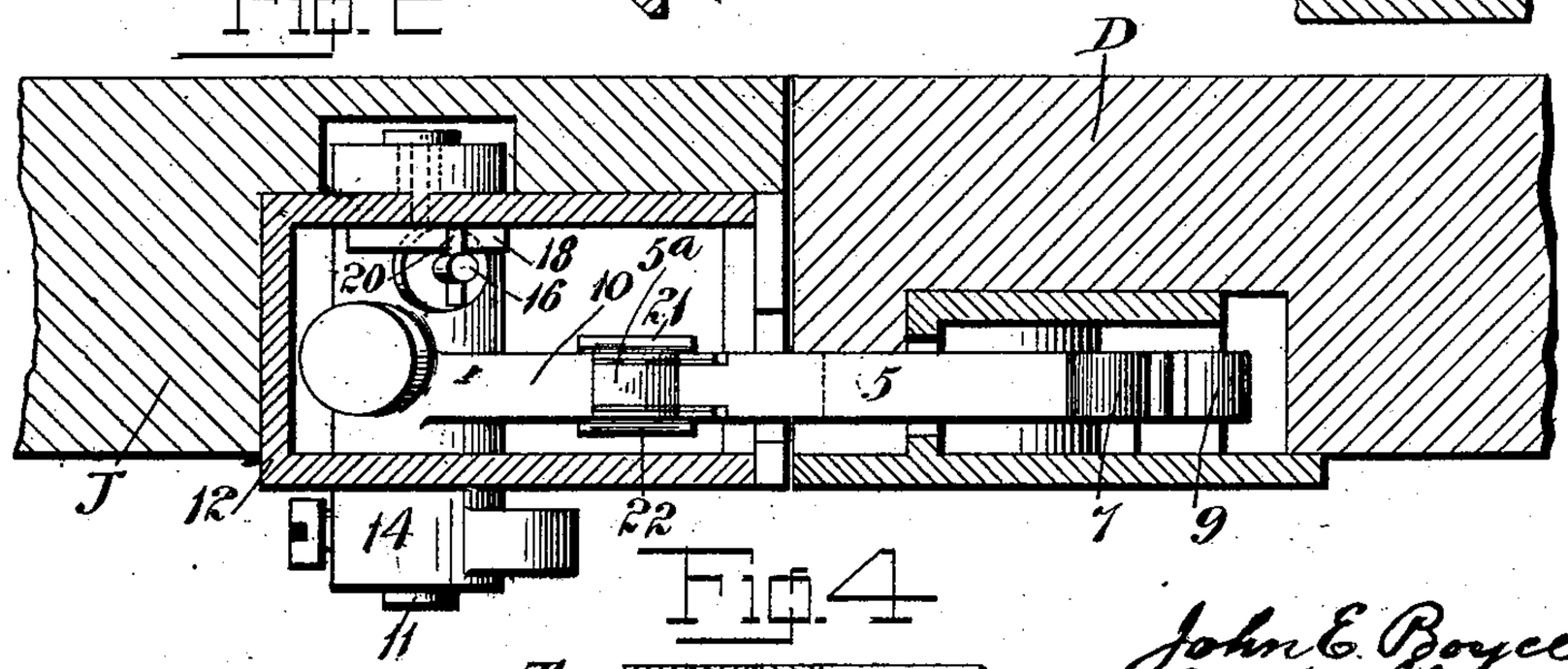
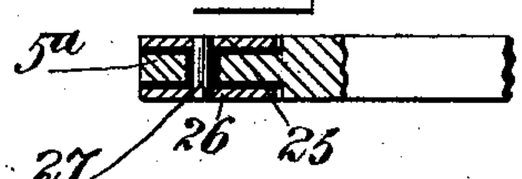


Fig. 4



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UNITED STATES PATENT OFFICE.

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DOOR-LOCK FOR ELEVATOR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 726,018, dated April 21, 1903.

Application filed February 2, 1903. Serial No. 141,486. (No model.)

To all whom it may concern:

Be it known that we, JOHN E. BOYCE, of the borough of Manhattan, in the city of New York, and LUDLOW SHONNARD, of Yonkers, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Door-Locks for Elevator-Shafts, of which the following is a specification.

Our invention relates to improvements in locks to prevent the opening of the door of an elevator-shaft when the elevator-car is not in position at such door.

The subject of our invention is a door-lock provided with a moving catch or keeper in the door-jamb, which when the door-latch is retracted follows up the movement of the said latch so as to prevent it disengaging from the catch or keeper unless such movement of the catch be prevented by a stop applied by the car when resting in position opposite the door.

The invention further relates to an improvement by which the unlocking of the latch is prevented if an attempt be made to hold it back while the car is passing the station without stopping.

In the accompanying drawings, Figure 1 is a front view of the lock and engaging catch as viewed from the outside. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view of a detail, showing the locking device which prevents the unlocking of the door-latch while the elevator-car is in motion and passing the station. Fig. 4 is a detail sectional view of an electric contact device used in connection with our invention to prevent the movement of the car while the door is open.

D may represent a part of the sliding door of the elevator-shaft, and J a portion of the jamb in which the keeper or engaging catch of the door-latch is mounted. The door-latch 5 is pivoted on a pin 6 and is provided with a rigid arm 7, projecting approximately at right angles from the horizontal latch-arm 5 in position to be retracted in customary manner by the fingers of the operator inserted in a suitable aperture 8 in the lock-casing. A spring 9, of any suitable form, serves to press the latch 5 into engaging position. The extremity of the latch 5 is formed, as shown, with a hook 5^a to engage with the hook-formed keeper or catch 10, mounted in the door-jamb. In our invention the hook-formed catch or keeper 10 is pivotally mounted on a pin 11, which is itself pivoted in the casing 12, so as to turn with the keeper 10. Said catch or keeper 10 is pressed toward the door-latch 5 by a spring 13, which may be of any suitable form, so that when not prevented by extraneous means the retraction of the latch 5 will cause the hook-catch 10 to follow up the movement of the latch, so as to prevent the latter disengaging therefrom.

Mounted rigidly on the rotatable pin 11 is an arm 14, which when the pin 11 is locked to the catch 10, as hereinafter described, serves to control the movement of said catch.

15 represents a tappet carried or controlled by the car and, when the car is in position opposite the shaft-door, projecting in front of the arm 14, so as to prevent the movement thereof, and consequently hold the pivoted catch 10 in its retracted position, thus permitting the retraction of the latch 5 from engagement with the catch or keeper 10 and the opening of the door.

In the operation of the invention as thus far described it will be understood that if an attempt be made to withdraw the latch 5 from its keeper 10 when the elevator-car is not in position at the door the oscillating catch 10, following the movement of the latch 5, will prevent the latch from unlocking, and hence it is impossible to open the door when the car is not in position. When, however, the car is in position at the door, the tappet 15, preventing the movement of the catch-arm 14, holds the hooked catch 10 in retracted position, so that the latch 5 may be retracted therefrom and the door opened.

With the invention as thus far described it might be possible for a party reaching the latch-arm 7 from the outside and holding the latch in retracted position while the car is in motion and approaching the station to cause the tappet 15 by coming in contact with the catch-arm 14 to withdraw the hooked catch 10 from the latch 5 while the latter is in retracted position and while the car is in motion. To prevent such unlocking of the door while the car is in motion, the following de-

vice is provided: Instead of having the pivot-pin 11, which is carried by the arm 14, permanently fixed to the oscillating catch 10 the said pin is locked to the catch by a radial pin 16, carried by the hub of the catch 10, and pressed inward by a spring 17, so as to engage with a notch 18 in the pin 11, and when the catch 10 turns on its axis retracted from such engagement with the pivot-pin 11 by a cam-shaped lug 19, projecting from the inner wall of the casing 12 in position to be engaged by a transverse pin or lug 20 near the extremity of the spring-pin 16, so that the movement of the oscillating catch 10, permitted by the retraction of the latch 5 and caused by the spring 13, will retract the spring-pin 16 from the pivot-pin 11, and thus disconnect the pin 11 and tappet-arm 14 from the oscillating catch 10. Such angular movement of the oscillating catch 10, following the retraction of the latch 5, having carried the spring-pin 16 out of register with the notch 18 in the pivot-pin 11, it will be apparent that the deflection of the arm 14 by the tappet 15 as the car passes the station will have no effect in retracting the oscillating catch 10 from the latch 5, and hence the door cannot be unlocked by movement of the car past the station while the latch 5 is held in retracted position. If the latch 5 be so held in retracted position when the car reaches the station and stops there, though the pivot-pin 11 has been turned back to normal position by the contact of the tappet 15 with the arm 14, the catch 10 is still held in engagement with the retracted latch by the action of the spring 13 and the spring-pin 16 is held by the fixed cam 19 out of engagement with the pivot-pin 11 until the latch 5 is released by the hand. Then the latch-spring 9 throwing both the latch 5 and the oscillating catch 10 into normal position, the spring-pin 16 will reëngage with the pivot-pin 11, and, the car being at rest at the station, the latch 5 can then be retracted from the catch 10, so as to permit the opening of the door.

It will be apparent that the obstruction 15, which is controlled by the movement of the car, so as to be interposed in front of the arm 14 when the car is in position at the door, may be a simple tappet carried by the car itself or a device mounted in the door-jamb and projected to position in front of the arm 14 by the movement of the car. Tappets and obstructing devices carried or controlled by elevator-cars, so as to govern the operation of the door and prevent the opening thereof when the car is not in position, being well known and in common use, a specific description of the connection of the obstructing device 15 with the car is unnecessary.

In order to show the applicability of our device to self-controlling electric elevators, in which the circuit is broken automatically by the opening of the shaft-door and is complete only when the door is closed, we have illustrated a circuit-closing device of common form, consisting of a pair of insulated contact-plates 21 22 on the opposite sides of the catch or keeper 10, connected respectively to the contact-wires 23 24, and a pair of insulated plates 25 26 on the opposite faces of the latch-hook 5^a, which are electrically connected by pin 27, insulated to the latch, so that when the door is closed and the latch 5 is in normal position in effective engagement with the oscillating catch or keeper 10 the operating-circuit will be closed between the contact-plates 21 22.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent:

1. In a lock for elevator-shaft doors, the combination of a spring-latch 5, an oscillating catch 10 with which said latch engages adapted to follow the movement of the latch 5 when the latter is retracted, and means operated by the elevator-car to prevent such movement of the oscillating catch when the car is in position at the door to be opened.

2. The combination of the spring-latch 5, the oscillating spring-catch 10 normally pressed into engagement with said latch 5 during the movement of the latter, an arm 14 adapted to hold the spring-catch 10 in retracted position, and the obstruction 15 controlled by the elevator-car interposed in the path of the arm 14 so as to arrest the movement of the spring-catch 10 when the car is in position at the door.

3. The combination of the spring-latch 5, the oscillating spring-catch 10 engaging therewith, and adapted to follow the movement of the latch 5 when retracted, an arm 14 connected by a pivot-pin 11 and locking-pin 16 to the catch 10 so as to control the movement of the said catch, the obstruction 15 controlled by the car to arrest the movement of the arm 14 when the car is in position, and means for retracting the locking-pin 16 from the pivot-pin 11 and thus disconnecting the arm 14 from the catch 10 when the absence of the obstruction 15 permits the movement of the oscillating catch 10.

4. The combination of the spring-latch 5, the oscillating spring-catch 10, rotating pivot 11, arm 14 mounted on the pivot-pin 11, spring-pin 16 locking the arm 14 to the oscillating catch 10, and a fixed lug 19 retracting the locking-pin 16 from the pivot-pin 11 by the angular movement of the catch 10, substantially as and for the purposes described.

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