J. S. MUCKLÉ.

INTERLOCKING MECHANISM FOR ELEVATORS.

APPLICATION FILED MAY 18, 1910.

981,463.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

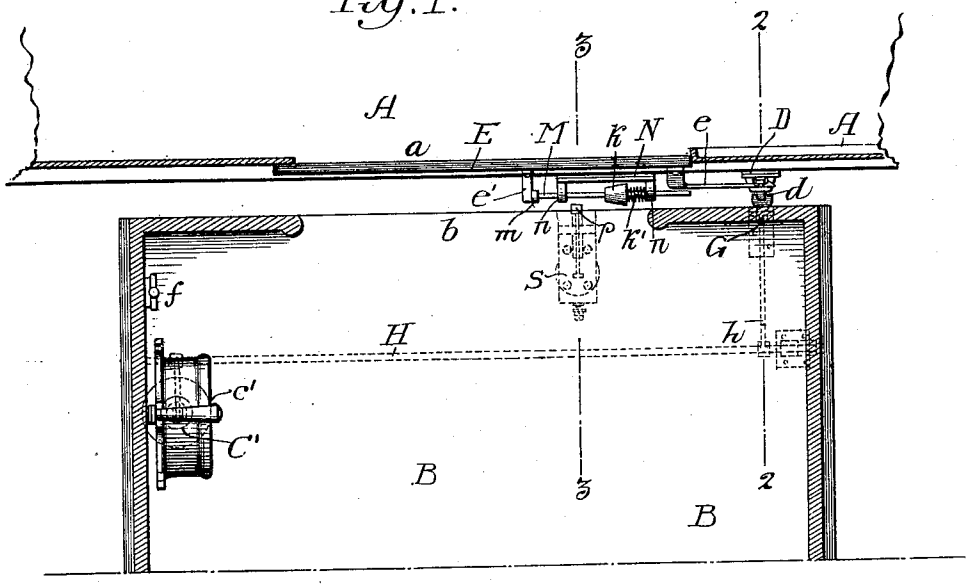
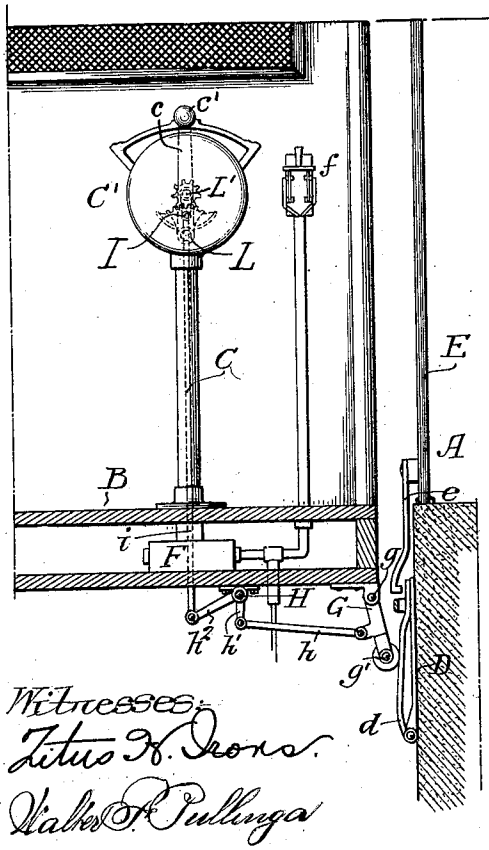


Fig. 2.

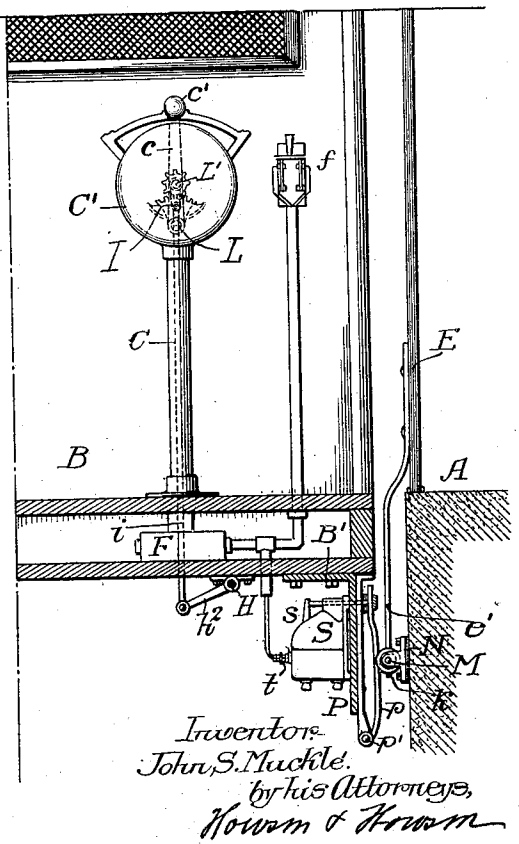


Witnesses:

Titus H. Dorr.

Wales F. Pullinger

Fig. 3.



Inventor:

John S. Muckle.

by his Attorneys,

Howson & Howson

J. S. MUCKLÉ.

INTERLOCKING MECHANISM FOR ELEVATORS.

APPLICATION FILED MAY 18, 1910.

981,463. **Patented Jan. 10, 1911.**

2 SHEETS—SHEET 2.

Fig. 4.

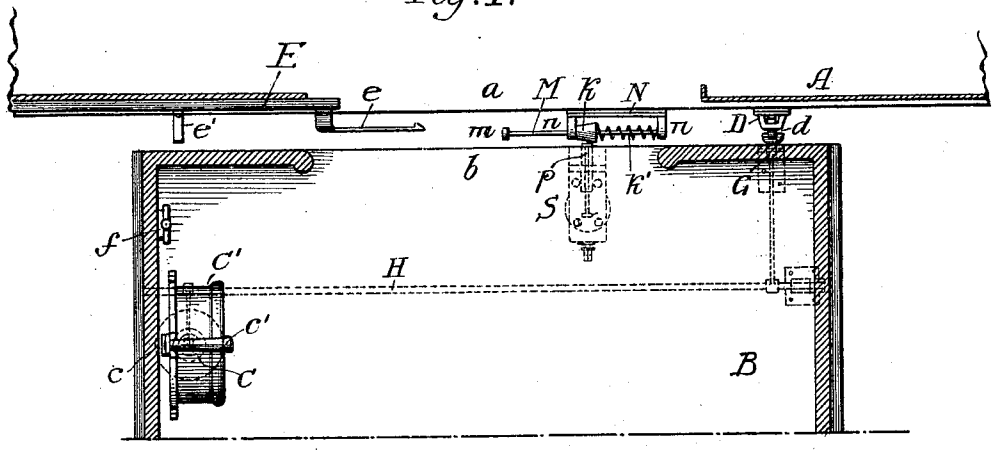


Fig. 5.

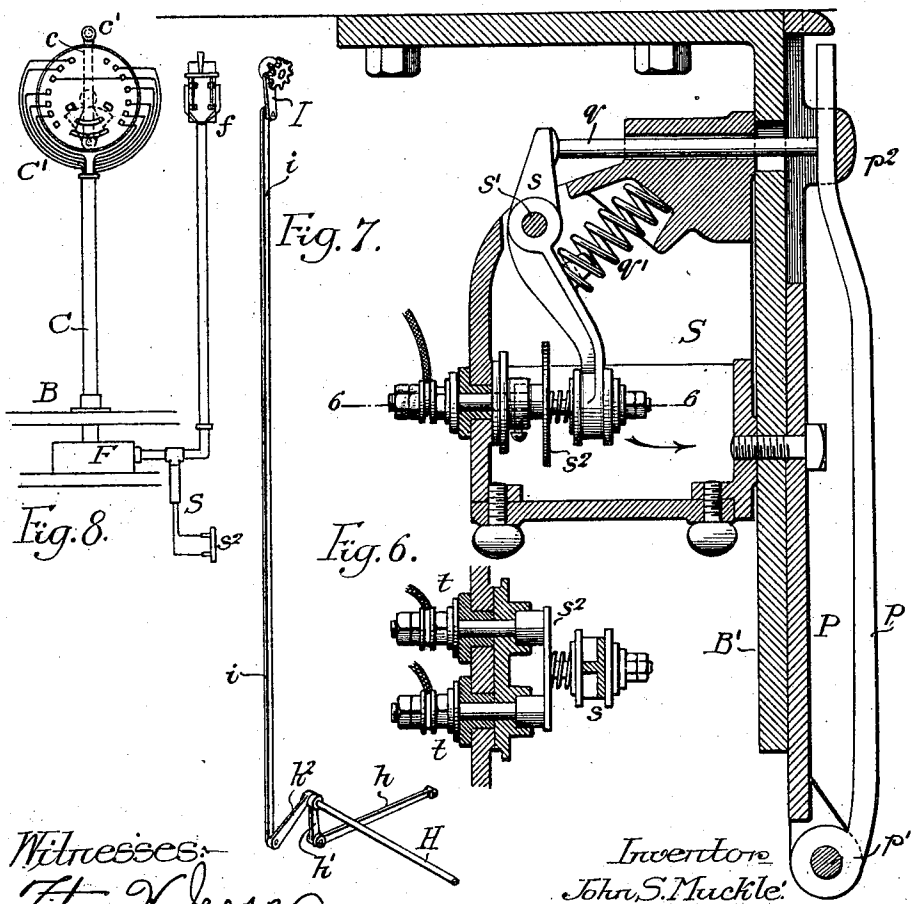


Fig. 8.

Fig. 7.

Fig. 6.

Witnesses:
Titus K. Ross.
Walter F. Pellinger

Inventor
John S. Muckle.
by his Attorneys,
Howson & Howson

UNITED STATES PATENT OFFICE.

JOHN S. MUCKLÉ, OF PHILADELPHIA, PENNSYLVANIA.

INTERLOCKING MECHANISM FOR ELEVATORS.

981,463. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed May 13, 1910. Serial No. 561,943.

To all whom it may concern:

Be it known that I, JOHN S. MUCKLÉ, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Interlocking Mechanism for Elevators, of which the following is a specification.

The object of my invention is to provide means for cutting out the electric operating mechanism of an elevator when a landing door is open, and to provide means for locking the door when closed and when the elevator car is not at the landing.

In the accompanying drawings:—Figure 1, is a sectional plan view of a landing and sufficient of an elevator car to illustrate my invention; Fig. 2, is a sectional elevation on the line 2—2, Fig. 1; Fig. 3, is a sectional elevation on the line 3—3, Fig. 1; Fig. 4, is a plan view similar to Fig. 1, with the door in the open position; Fig. 5, is a view of one form of switch which may be used in carrying out my invention; Fig. 6, is a sectional view on the line 6—6, Fig. 5; Fig. 7, is a detached perspective view showing the mechanical connection between the operating lever and the door latch; and Fig. 8, is a diagrammatic view illustrating one arrangement of wiring.

A is a landing and B is a car arranged to travel in the elevator well. The mechanism for starting and stopping this car is controlled by electric apparatus, the particular form of electric apparatus, however, forms no part of this invention.

In the present instance there is a standard C in the car having a controller C′ at its upper end.

c is an operating lever having a handle *c′*. The operating lever is mounted on a shaft L and this shaft is geared to a central shaft L′ through a segment and pinion and on this shaft is the usual contact arm. The wiring is such that when the handle *c′* is in the central position, as illustrated in Fig. 2, the car is at a standstill. When the handle is shifted toward one side the mechanism raises the car, and when shifted to the opposite side the mechanism lowers the car.

Below the floor of the car is a junction box F and at one side of the controller is a switch *f* having wires leading through suitable tubes and through the junction box to the controller C′, so that when the lever of the switch *f* is thrown to the open position the electric mechanism in the car is cut out. This switch is used as an emergency switch and may be either exposed or inclosed, as desired, and this switch and the controller form no part of my invention, but I use, for convenience, the wires leading to this switch to couple my improved automatic interlock mechanism to the electrical controller of the car.

In the car B is a doorway *b*, and *a* is the doorway of the landing A. E, in the present instance, is a sliding door adapted to close the doorway *a* of the landing, and this door has a headed projection *e* which engages a latch *d* mounted on a plate D secured to the side of the elevator well. This latch is held out by a spring coiled around its pivot in the present instance and the projection *e* has a beveled head, so that when the door is closed it will strike the latch *d*, depressing it until the latch is released, after which the latch will spring back of the projection, locking the door in the closed position. The latch *d* is controlled by a lever G pivoted at *g* to a plate on the underside of the car, and this lever is provided with a roller *g′* which can be forced against the latch *d* to open it.

The lever G is connected by a rod *h* to the arm *h′* on a rock shaft H mounted in bearings on the underside of the car, and on this rock shaft is an arm h^2 connected by a rod *i* to an arm I on the hub of a pinion geared to a segment on the controller shaft L, so that when the handled lever *c* is moved into central position to stop the car, the lever G is pressed against the latch *d* so as to release the door E which can be opened to allow the passengers to leave and enter the car.

In order to prevent the mechanism being operated while the door E is open, I secure, in the wall of the elevator well, a bracket N having bearings *n*, *n* in which is mounted a rod M having a head *m*. Secured to the rod is a cone sleeve *k*, and back of this cone sleeve is a spring *k′* which tends to force the rod into the position illustrated in Fig. 4.

Secured to a bracket B′ depending from the car B is a plate P to which is pivoted an arm *p* at *p′*. The movement of the arm is limited by a strap p^2, Fig. 5. Also secured to the depending bracket B′ is a switch box S, in the present instance having a switch lever *s* pivoted at *s′* and carrying a spring contact plate s^2. Projecting through the box are two electric terminals *t*, *t*, and ex-

tending from the short arm of the lever s to the arm p is a rod q, and mounted between the long arm of the lever s and the casing of the switch box is a spring q', so that the tendency of the lever is to hold the arm p in the position illustrated in Fig. 5, and the contact plate s^2 against the two contacts t, t.

On the door E is an arm e' which contacts with the head m of the rod M, so that when the door is closed the arm e' will hold the rod M in the position illustrated in Fig. 1, compressing the spring k' and holding the cone sleeve k away from the arm p, and the plate s^2 will rest against the contacts t, t, so as not to interrupt the electric connections between the controller and the controlling mechanism of the car, but as soon as the lever e is moved to the central position the door will be released and the spring k' will force the door open and the cone sleeve will strike the arm p, depressing it, which will cause the contact plate s^2 to be drawn away from the contacts t, t, thus breaking the circuit and cutting out the electric mechanism of the controller.

By the above construction it will be seen that I automatically cut out the electric mechanism when the door is opened and, when the door is closed and the car is not at the landing, the landing door is locked mechanically. It will be understood that there is a latch d and a bracket N at each landing, but all the electric interlocking mechanism is carried by the car.

I claim:—

1. The combination of a landing, a door at the landing, an elevator car, an electric controlling device on the car, a latch for locking the door in the closed position, mechanical means on the car for actuating the latch when the car is stopped at the landing, an electric switch on the car in the circuit of the controller, means for holding the switch in the closed position when the car is moving, and a spring actuated mechanism on the well at the landing which operates to throw the switch open when the door is released, said actuating mechanism being held out of position when the door is closed.

2. The combination of a landing, a sliding door at the landing, a car, electric controlling mechanism on the car, a lever for actuating said controlling mechanism, a latch on the wall of the well at the landing, an arm on the door engaged by the latch when the door is closed, an arm on the car for releasing the latch, means connecting said arm with the controlling lever, a bracket on the elevator well, a rod mounted in the bracket, a tapered sleeve on the rod, a spring tending to force the rod in one direction, an arm on the door holding the rod against the pressure of the spring when the door is closed, a switch on the car, and an arm on the car connected to the switch and actuated by the tapered sleeve, the said switch being in the electric circuit of the controller so that when the landing door is opened the switch will be opened, breaking the circuit between the controller on the car and the operating mechanism so as to prevent the starting of the car when the door is opened.

3. The combination of a landing, a landing door, an elevator car, electrical controlling mechanism on the car, an electric switch mounted under the car and in the circuit of the electrical controlling mechanism, a pivoted arm on the car for actuating said switch, and means on the elevator well for moving said arm when the door is open so as to cut out the electric controlling mechanism on the car, and a projection on the door for holding the said means out of operative position when the door is closed.

4. The combination of a landing, a sliding landing door, an elevator car, hand operated electrical controlling mechanism within the car, a switch secured to the underside of the car for cutting out the electrical controlling mechanism on the car when the car has been brought to a standstill at a landing, an arm on the car for actuating said switch, a sliding rod, a cone on said rod, a spring tending to move the cone forward, said cone when projected contacting with the arm on the car to break the circuit of the controlling mechanism, and means on the sliding door tending to hold the rod clear of the arm on the car.

5. The combination in an elevator, of a series of landings, each having a sliding door and a projection on each door, a latch at each landing engaging the projection on the door to lock it in its closed position, a car, electrical controlling means on the car, a hand lever for shifting the mechanism, an arm on the bottom of the car arranged in line with the several latches in the elevator well, mechanical means between the operating arm of the controlling mechanism and the latch arm on the car for throwing said latch arm out to depress a latch and release the door, a switch arranged in the circuit of the electrical controlling means, and means on the wall of the elevator well at each landing for actuating the switch when the door is open, said mechanism at each landing being held out of operative position by the door when closed.

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

JOHN S. MUCKLÉ.

Witnesses:
WALTER CHISM,
WM. A. BARR.