J. S. MUCKLÉ.

INTERLOCK MECHANISM FOR ELEVATORS.

APPLICATION FILED JULY 19, 1909.

957,702.

Patented May 10, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

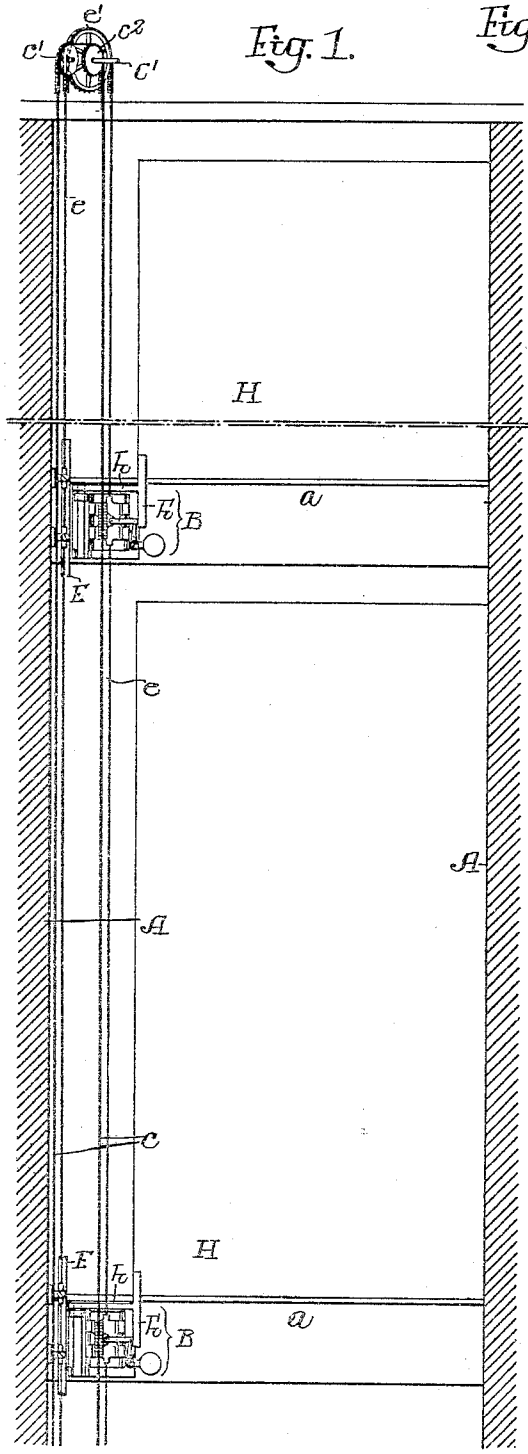
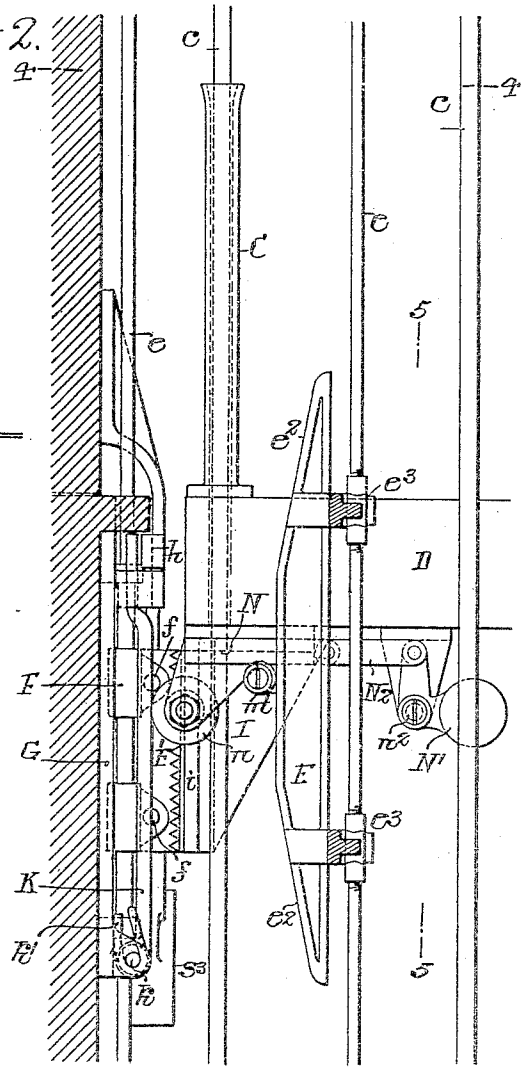


Fig. 2.



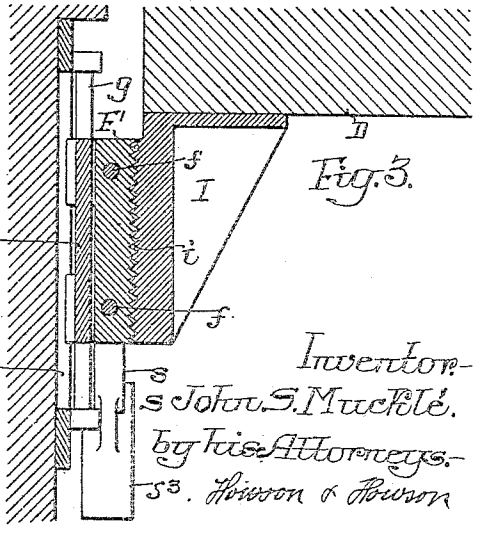


Fig. 3.

Witnesses.-
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2 SHEETS—SHEET 2.

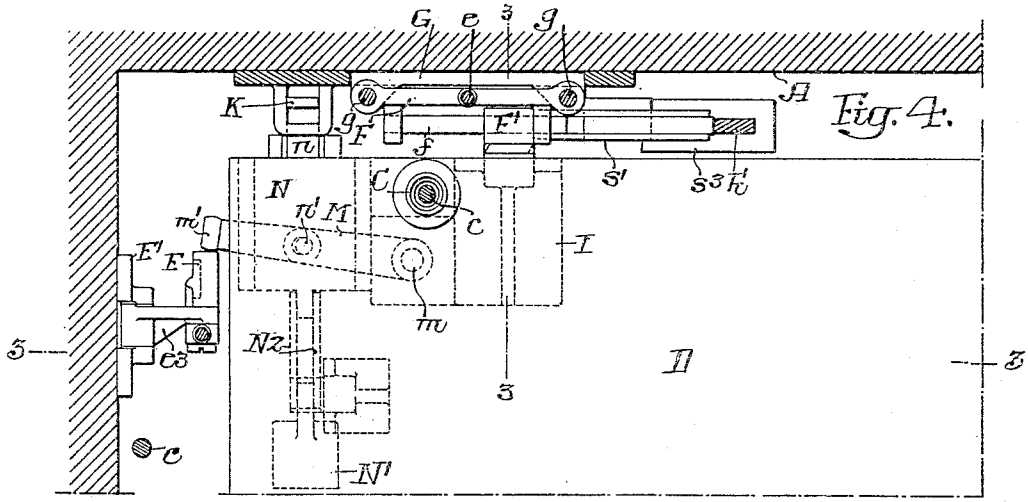

Fig. 4.

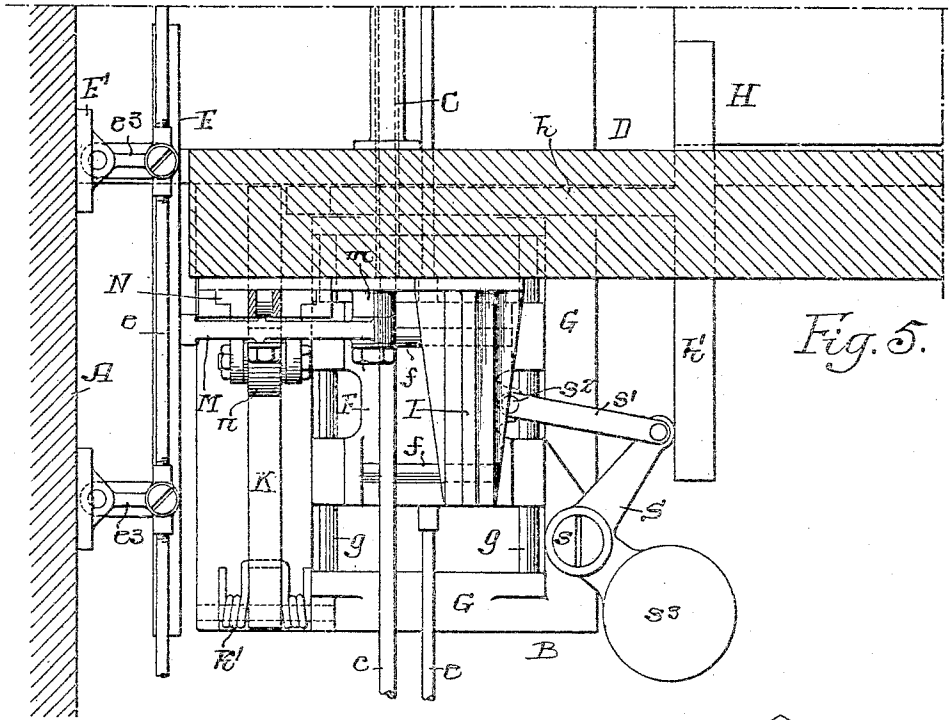

Fig. 5.

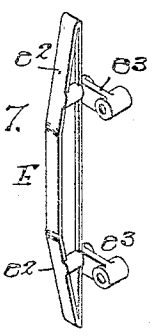

Fig. 7.

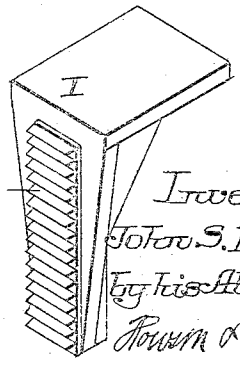

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN S. MUCKLÉ, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO STANDARD ELEVATOR INTERLOCK COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

INTERLOCK MECHANISM FOR ELEVATORS.

957,702. Specification of Letters Patent. Patented May 10, 1910.

Application filed July 19, 1909. Serial No. 508,421.

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 Interlock Mechanism for Elevators, of which the following is a specification.

The object of my invention is to construct interlock mechanism for use in elevators of the type in which a hand cable or rope is used to actuate the controlling mechanism for starting and stopping the reversing gear; the mechanism being so constructed that the landing doors cannot be moved from the platform until the door at that particular platform is closed.

In the accompanying drawings:—Figure 1, is a vertical sectional view of an elevator well illustrating my improved mechanism; Fig. 2, is a sectional view through the elevator well and a side view of a portion of the car; Fig. 3, is a sectional view on the line 3—3, Fig. 4; Fig. 4, is a sectional view on the line 4—4, Fig. 2; Fig. 5, is a sectional view on the line 5—5, Fig. 2; and Figs. 6 and 7, are views illustrating details of my invention.

A, A are the walls of the elevator well.

a, *a* are the landing floors.

B is the interlock mechanism located at each landing floor; being secured to the walls of the elevator well in any suitable manner.

D is the elevator car and this car carries on its underside the other part of the interlocking mechanism.

c is the hand cable or rope which, in the present instance, passes through a tubular shield C on the car D. This hand cable is connected to the valves or other controlling mechanism either at the base or at the head of the elevator well. In the present construction the valve operating mechanism is at the base of the well and the cable passes over two sprocket wheels c', c^2 at the head of the well; the cable at this point being in the form of a chain so as to engage the sprocket wheel c^2 to insure its turning as the cable is moved in either direction.

On the shaft C′ carrying the sprocket wheel c^2 is a sprocket wheel e' around which passes the controlling cable *e*. This cable also has a chain section where it passes around the wheel so as to insure its moving with the wheel. On one strand of the cable *e* is secured a cam E, which is tapered at each end e^2, as shown in Figs. 2 and 7; there being one of these cams at each landing door. The cams E are connected by links e^3 to brackets E′ secured to the elevator well so that when the cable *e* is moved vertically the cams will be moved into and out of operative position with the mechanism on the elevator car. The other strand of the cable *e* is attached to a slide F adapted to slideways *g* on a frame G secured to the wall of the elevator well. These slideways in the present instance are in the form of round bars and carried by the slide are two transverse rods *f* on which is mounted a sliding toothed plate F′. The teeth of this plate are so shaped as to be engaged by the teeth *i* of a bracket I secured to the underside of the car D, and illustrated in detail in Fig. 6, so that when the teeth of the bracket and the teeth of the sliding plate are in engagement any movement of the car will be transferred to the cable *e* through the toothed bracket I and the toothed plate F′, and as the cable *e* is geared to the controlling mechanism *c* through the sprocket wheels at the head of the elevator well this motion will be communicated to the valve mechanism, consequently the car will be always maintained at the landing, as any drop in the car will operate the valve mechanism so as to bring it back to position.

H is the landing door closing the entrance to the elevator well. This door has at one corner a hooked bar *h* with which engages a latch K pivoted at *k* to the frame G. A spring *k′* tends to force the latch out and into engagement with the hooked bar *h*. This latch when in its normal position engages the hooked bar *h* and prevents the door being opened until the car is at the landing.

In order to push the latch back clear of the hooked bar *h*, I provide a slide N mounted in ways on the underside of the car floor D. This slide has a roller *n* which is adapted to press against the latch K when moved forward. Pivoted to the underside of the car at *m* is a lever M which projects beyond the edge of the car, as shown in Fig. 4, so as to be acted upon by the shifting cam E. On the end of the lever is a roller *m′* which travels on the cam E. On the slide N is a

pin n' which enters a slot in the lever M so that any movement of the lever will be imparted to the slide. When the cam E is shifted clear of the roller m' then the lever M and the slide N will not be actuated.

In order to return the slide N after it is free of the control of the cam E, I provide a lever N′, which is pivoted at n^2. One arm of this lever is connected by a link N^2 to the slide N and the other arm is weighted, as clearly shown in Fig. 2.

S is a weighted lever pivoted at s to the frame G and one arm of this lever is connected by a link s' to a pin s^2 on the sliding toothed plate F′. This arm of the lever is in line with the depending bar h' carried by the door H and the weight s^3 is sufficient to move the sliding plate to position in line with the toothed bracket I when the lever is released on the opening of the door. When the door is closed the depending bar pushes the lever S and moves the plate out of line with the toothed bracket I on the car D.

The operation is as follows:—When the car is in motion then the cam E is out of the path of the end of the lever M carried by the car, and as the door is closed the parts on the elevator well and those on the car are out of line so that the mechanism will not be operated. When a car is stopped at a landing the movement of the cable will cause the cam E to be shifted into the path of the lever M on the car and as the car nears the landing the roller m will slide upon the cam E, moving the lever M out and with it the slide N and this slide will push back the latch K and release the door. The moment the door is released and opened the weighted lever S is released and will move the sliding, toothed plate F′ into engagement with the toothed bracket I on the car. This movement couples the cable e with the controlling cable c, so that any movement up or down of the car will be transferred to the operating cable c and this movement will operate the controlling valves to return the car to its normal position with its floor in line with the floor of the landing, so that any leakage in the valve mechanism will not interfere with the proper alinement of the car floor with the landing. Moreover, the toothed bracket on the car prevents the movement of the controller rope c while the landing door is open, as the cable e is connected to the controller cable c through the mechanism at the head of the elevator well. As soon as the door is closed the depending bar h' forces the sliding toothed plate F′ out of engagement with the toothed bracket I, thus freeing the car D from the control of the toothed plate F′, and as the controller rope is operated to start the car in either direction it will shift the cam E out of the path of the lever M, at the same time the lever and the slide N will be withdrawn by the weighted lever N′. This will release the latch K, which will engage the hooked bar h and this will prevent the opening of the door until the car is again brought to a stop at the landing.

I claim:—

1. The combination in interlocking mechanism for elevators, of a car, a landing, a door at said landing, a latch by which the door is locked in a closed position, means on the car for actuating the latch, a controlling cable, a cam cable extending throughout the well, said cam cable being connected to the controlling cable, a movable cam on said cam cable for operating the latch actuating means, and means for positively connecting the car with the cam cable when the car is at rest.

2. The combination in interlocking mechanism for elevators, of a landing, a car, a controlling cable for actuating the controlling mechanism of the car, a second cable, a cam connected to said second cable adapted to be thrown into and out of action when said cable is moved in either direction, a slide on the body of the car, a lever on the car engaging the slide and arranged to be actuated by said cam when in position, a latch on the elevator well actuated by the slide, a landing door locked by the latch, and means for positively coupling the cam cable to the car when the landing door is open.

3. The combination in interlocking mechanism for elevators, of a landing, a door closing the landing, a latch on the elevator well for locking the door in a closed position, a car means on the car for actuating the latch, a controlling cable extending throughout the well, a cam mounted in the well, a cable attached to said cam and also extending throughout the well, means connecting the cam cable with the controlling cable so that when the controlling cable is moved to stop the car the cam will be shifted into position to move the latch actuating mechanism of the car.

4. The combination in interlocking mechanism for elevators, of a landing, a landing door, a latch in the elevator well for locking the door in its closed position, a car means on the car for actuating the latch, a controller for stopping and starting the car, a cam pivoted to the side of the elevator well, a cable connected to the cam and to the controlling mechanism of the car, a toothed bracket on the car, a toothed plate on the wall of the elevator well, and means whereby the two elements can be thrown into and out of engagement on the opening or closing of the door, said toothed plate being connected to the cable to which the cam is attached.

5. In interlocking mechanism for elevators, the combination of a landing, a landing

door, a latch for locking the door in its closed position, a car means on the car for actuating the latch, a controller for stopping and starting the car, a cam on the side of the elevator well, a cable connected to the cam so that on the movement of the cable the cam will be moved into and out of position to engage the actuating mechanism on the car, a slide on the elevator well to which the cable is also attached, a sliding toothed plate carried by the slide, a toothed bracket on the car arranged to be engaged by the sliding plate, and means on the door for moving the plate into and out of position, the said cable being connected to the controlling mechanism so that any movement of the car after it is brought to the landing will be imparted to the controlling mechanism so that the floor of the car will be in line with the landing.

6. The combination in interlocking mechanism for elevators, of a landing, a landing door, a latch for locking the landing door in its closed position, a car, latch operating mechanism on the car, a controlling cable, a cam pivoted to the side of the elevator well, a cable connected to the cam, the two cables being connected together at the head of the elevator well, a toothed bracket on the car, a carrier attached to the cable which is connected to the cam, a sliding toothed plate on the carrier adapted to be moved into engagement with the toothed bracket on the car, a weighted lever connected to the toothed plate, and means on the door for actuating the lever to shift the plate out of engagement with the toothed bracket when the door is closed.

7. The combination in interlocking mechanism for elevators, of a series of landings, a door at each landing, a car, a hand cable extending through the elevator well and connected to the controlling mechanism of the car, a cam pivoted to the side of the elevator well at each landing, a cable attached to the several cams and connected to the controlling cable, a latch on the wall of the elevator well at each door and adapted to lock the door when in its closed position, a slide on the car, a roller carried by the slide adapted to press against the latch and release the door, a weighted lever connected to the slide, a pivoted arm also connected to the slide and adapted to be actuated by one of the cams when said cams are moved into position, a toothed bracket on the car, guides at each landing, slides adapted to move vertically on the guides, each slide being connected to the cam cable, a toothed plate mounted to move transversely on each slide and to engage the toothed bracket on the car when the car is at the landing, a weighted lever connected to said sliding plate, and an arm on the door adapted to strike said lever and shift the plate when the door is moved to the closed position.

8. The combination in interlocking mechanism for elevators, of a series of landings, a door at each landing, a plate secured to the elevator well at each landing, a spring latch pivoted to each plate and adapted to engage and lock the landing door when said door is closed, vertical guides on each plate, a slide adapted to the guides, a cam pivoted to the wall of the elevator well at each landing, a cable connecting the several cams and the several slides, a wheel around which the cable passes, a car, a controlling cable connected to the controlling mechanism of the car, a wheel around which the said cable passes, said wheel being mounted on the same shaft as the wheel of the cam cable so that one cable will move with the other, transverse guides on each slide, a toothed plate mounted on each of the transverse guides, a toothed member on the car adapted to be engaged by the toothed plate, means on the car engaged by the cam for operating the latch, and means on the door for moving the plate out of line with the toothed member on the car when the door is closed.

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

JOHN S. MUCKLÉ.

Witnesses:
WM. E. SHUPE,
WM. A. BARR.