No. 837,168. PATENTED NOV. 27, 1906.

H. H. WILSON.

SAFETY APPLIANCE FOR ELEVATORS.

APPLICATION FILED MAR. 23, 1906.

2 SHEETS—SHEET 1.

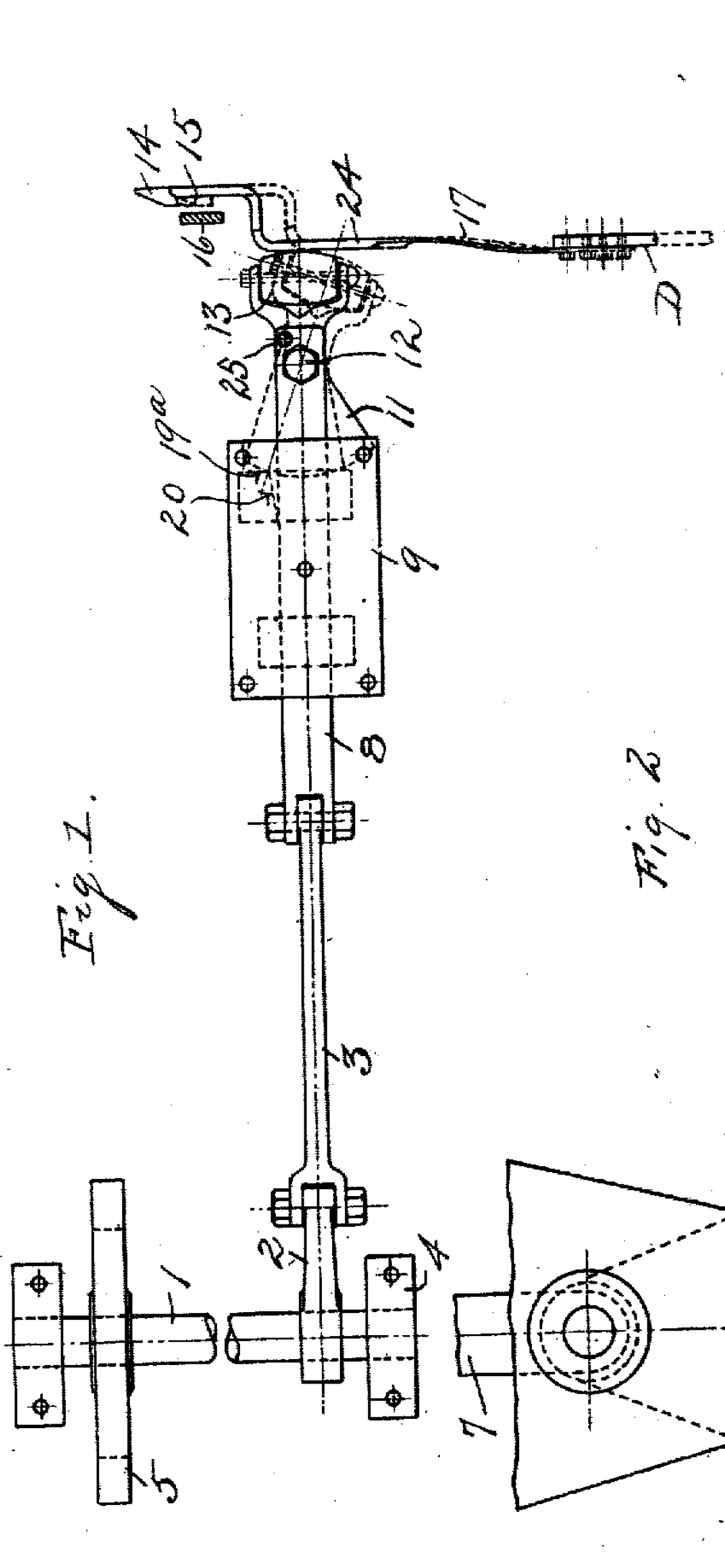

Fig. 1.

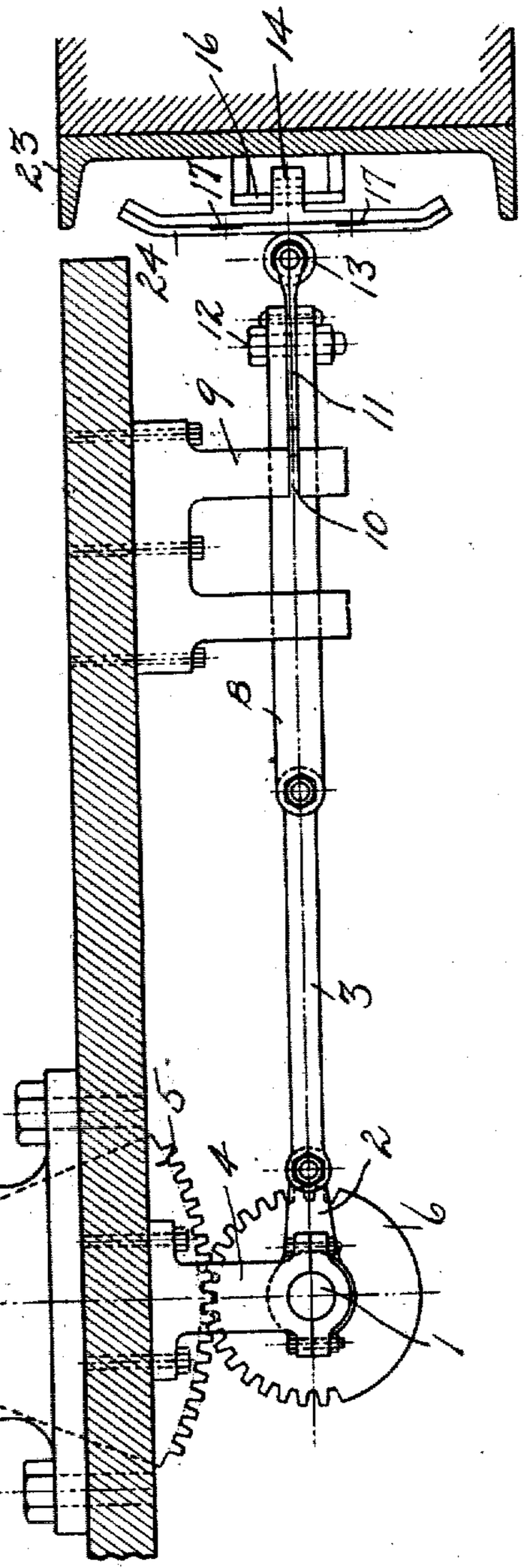

Fig. 2.

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2 SHEETS—SHEET 2

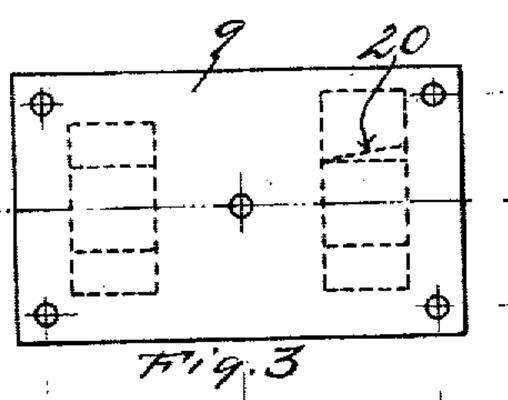

Fig. 3

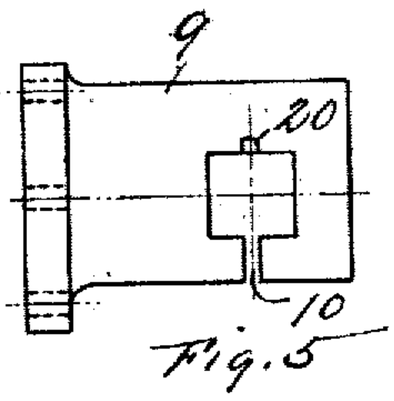

Fig. 5

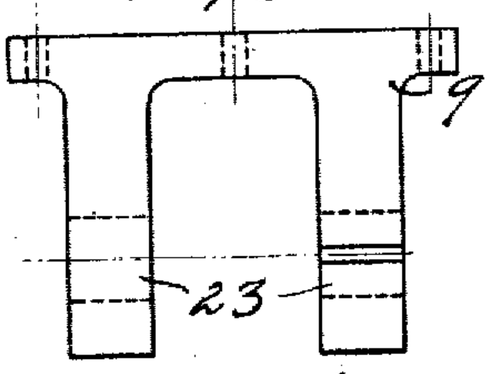

Fig. 4.

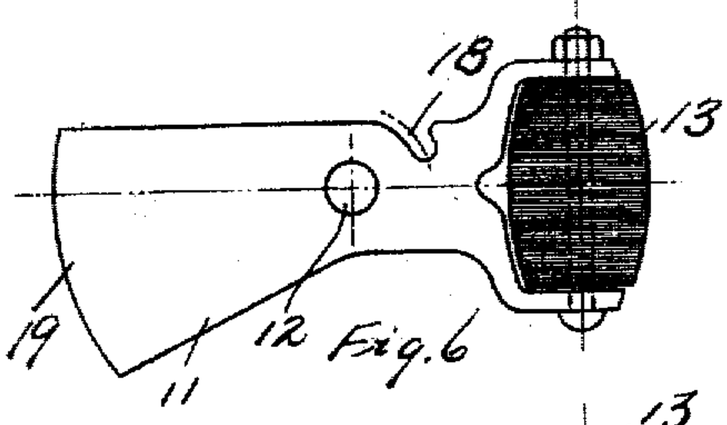

Fig. 6

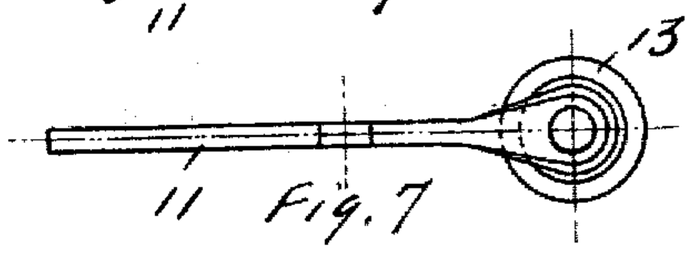

Fig. 7

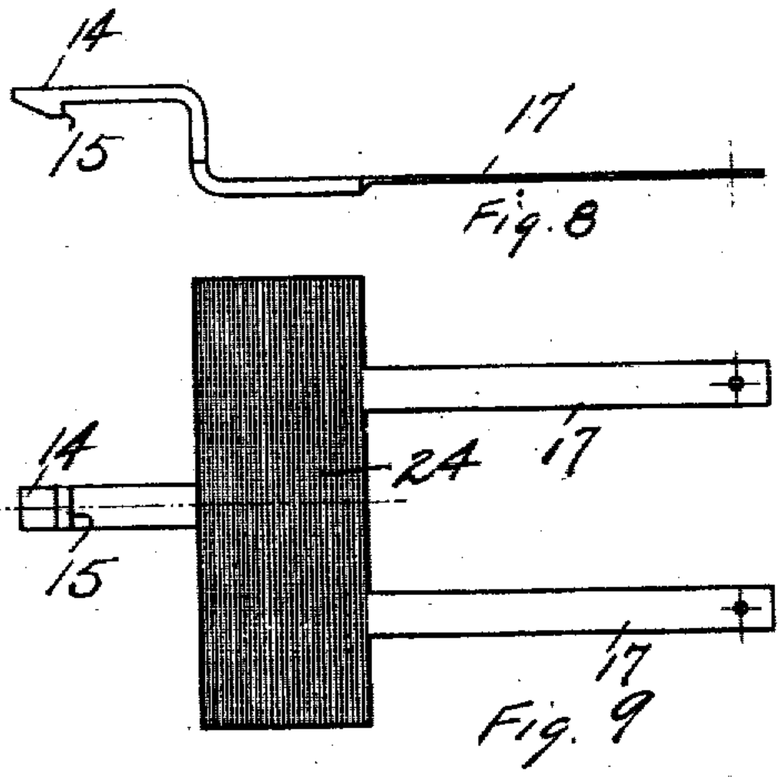

Fig. 9

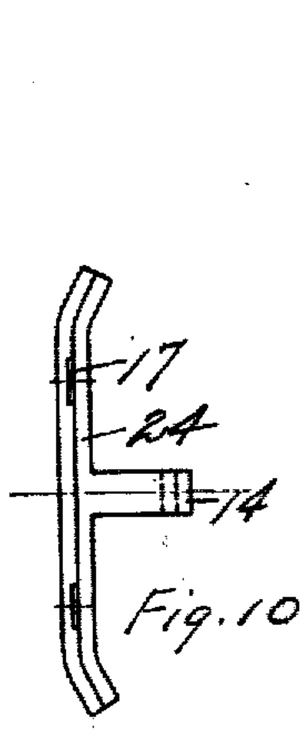

Fig. 10.

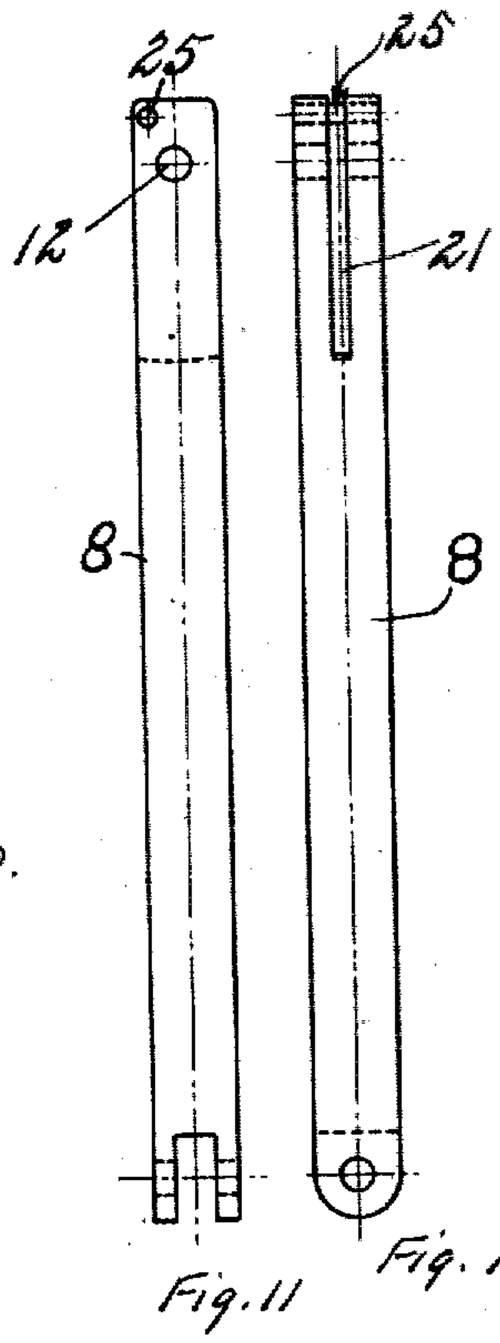

Fig. 11

Fig. 12.

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HEARLEY HOWELL WILSON, OF ALTOONA, PENNSYLVANIA.

SAFETY APPLIANCE FOR ELEVATORS.

No. 837,168. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed March 23, 1906. Serial No. 307,709.

To all whom it may concern:

Be it known that I, HEARLEY HOWELL WILSON, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Safety Appliances for Elevators, of which the following is a specification.

This invention relates to safety appliances for elevators, and contemplates a novel arrangement of parts whereby an elevator-car is made to be inoperative when the shaft-door is open, thus obviating all danger arising from elevator-doors being left open by the car operator.

The object of this invention is to provide means by which it is impossible to move the elevator-car while the door at which the car is standing is open.

Another object is to provide means by which it is impossible to open the door to the elevator-shaft while the car is at any point in the shaft other than directly in front of the shaft-door and to automatically unlock the door when the landing is reached.

A further object of this device is to provide means by which the elevator-car is locked against control by the opening of the shaft-door and can only be moved by the operator closing such door in front of which the car is standing, after which the car is free to move the full length of the shaft without interfering with the locking mechanism at any door except those at which the operator desires to stop.

With these and many other objects in view, that will be pointed out as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts as herein pointed out, illustrated, and claimed.

It should be further understood that this invention is susceptible to structural change or modification without departing from the scope of the invention, but a preferable embodiment of the same is shown in the accompanying drawings, in which—

Figure 1 is a plan view of the operating mechanism of the present invention as it appears beneath the elevator-car floor, the floor being shown removed. Fig. 2 is a side view of the parts shown in Fig. 1, showing in section a portion of the car-landing. Figs. 3, 4, and 5 are plan, side, and end elevation views of the locking-bracket, showing the location of the locking-plunger opening and the clearance-slot for the locking-plate. Figs. 6 and 7 are plan and side elevation views of the locking-plate together with the roller mounted in position. Figs. 8, 9, and 10 are plan, side, and end elevation views of the spring-plate that is secured to the door of the elevator-shaft. Figs. 11 and 12 are top and side views of the locking-plunger that receives the locking-plate at one end and the operating-link at the other.

Similar characters refer to similar parts throughout the several views of the drawings.

The mechanism may be described as follows.

Figs. 1 and 2 show the relative position and location of parts on the elevator-car and also those at the car-landing when the car is immediately in front of the landing or the elevator-shaft door. Referring particularly to these views, 1 represents the operating-shaft, that is actuated through the toothed segment 5 and the segment-gear 6 on said shaft. A crank 2 on the shaft 1 is connected through the intermediate link 3 to the locking-plunger 8 sliding in bearings 23 of the locking-bracket 9. The locking-plunger 8 is provided with a slot 21, which receives the locking-plate 11, provided with a locking-cam edge 19 at one end and a forked opening at the other in which is carried the roller 13, which is to be provided with grooves or some frictional substance.

To operate the mechanism, the operating-lever 7 is moved from its central position, which movement rotates the gear 6, which in turn moves the operating-shaft 1. The crank 2 being fixed upon the operating-shaft, any movement of the shaft will necessarily result in a movement of the crank. This will cause the locking-plunger 8 to move backward from the landing 23, locking the shaft-door through the medium of the hook 15 of the spring 17 engaging the fixed catch 16 at the landing, thus locking the door and leaving the car free to move.

If it is assumed that the car has reached the landing 23, as shown in Fig. 2, and the operator opens the door of the shaft to discharge passengers, the position of the operating-lever 7 must be vertical or in such a position that the spring-plate 24 will engage the roller 13. This engagement of the spring-plate 24 (which is secured to the shaft-door and which is to be grooved or covered with some frictional substance) with the roller 13 on the car will cause the locking-plate 11 to

assume a position as shown in dotted lines in Fig. 1. In this position the locking edge 19 of the locking-plate 11 will engage an unslotted edge or side 19ª of the locking-bracket 9, thus preventing any movement of the operating-lever 7, and hence any movement of the car in either direction. It will also be noticed that the edge of the roller does not disengage with the spring-plate until the locking edge 19 has engaged the locking-edge of the locking-bracket. Should slipping occur between the roller 13 and the spring-plate 24 upon opening the door, the pin 25, which passes through the plunger 8 and fits in the circular groove 18 of the locking-plate, will cause the plate, with the roller, to resume its proper position when closing the door. Should the slipping occur when the door is closed, the tapered groove 20 in the locking-bracket 9 will guide the plate 11 to its proper place when starting the car. This groove 20 is only for the purpose of taking care of the slipping of the mechanism that is not to be accounted for otherwise. In other words, it will be noted that in the closing movement of the door the tendency to rock the plate 11 past a correctly-alined position with the clearance-notch 10 of the bracket 9 is corrected by the pin 25—that is, the pin 25 acts as a stop for the plate 11 when it reaches a proper alinement with the clearance-notch 10—and in the event of the plate 11 being but slightly inclined the tapered groove 20, when the plunger 8 is drawn upon, will permit the plate 11 to properly slide into the notch 10.

This device is applicable to elevator-cars with lever control with fulcrum above or below the floor and to cars with wheel control by substituting for gear-wheels a chain and a sprocket mounted on the controlling-wheel shaft and a sprocket mounted on the shaft of the device, the gear ratio to be such that the shaft of the device will revolve through one hundred and eighty degrees when the controlling-wheel is revolved.

It will be observed that when the roller of the locking plate or disk 11 is disengaged from the contact-plate 24 of the spring-latch device 17, carried by the shaft-door D, the latter is free to spring into engagement with the fixed keeper or catch 16, and through the reciprocation of the latch device when said roller is engaged therewith the locking-plate 11 is thrown in or out of alinement with the clearance-notch 10 of the bracket 9.

I claim—

1. In a safety device for elevators, the combination with the shaft-door, a latch device for said door, the elevator-car, and the elevator-controller carried by the latter, of a locking device carried by the car comprising a reciprocatory locking-plunger operatively connected with the elevator-controller, and a movable locking-plate pivotally mounted on the plunger and carrying a contact member for frictional engagement with said latch device, said locking-plate being adapted to be swung into interfering and non-interfering relation to a fixed abutment.

2. In a safety device for elevators, the combination with the shaft-door, of a spring-latch device carried by said door, the elevator-car and the elevator-controller carried thereby, and a locking device carried by the car and embodying a fixed locking-bracket, a reciprocatory locking-plunger carried by the bracket and operatively connected with the elevator-controller, and a swinging locking-plate pivoted to the locking-plunger and carrying a contact member for frictional engagement with the latch device, said locking-plate being adapted to be swung by the movement of the latch device respectively into interfering and non-interfering relation to said bracket.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

H. HOWELL WILSON.

Witnesses:

FRED. A. WHITTAKER,

NORMAN E. GEE.