C. O. MARX.

SAFETY LATCH FOR ELEVATOR DOORS.

APPLICATION FILED MAR. 24, 1915.

1,167,194.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1,

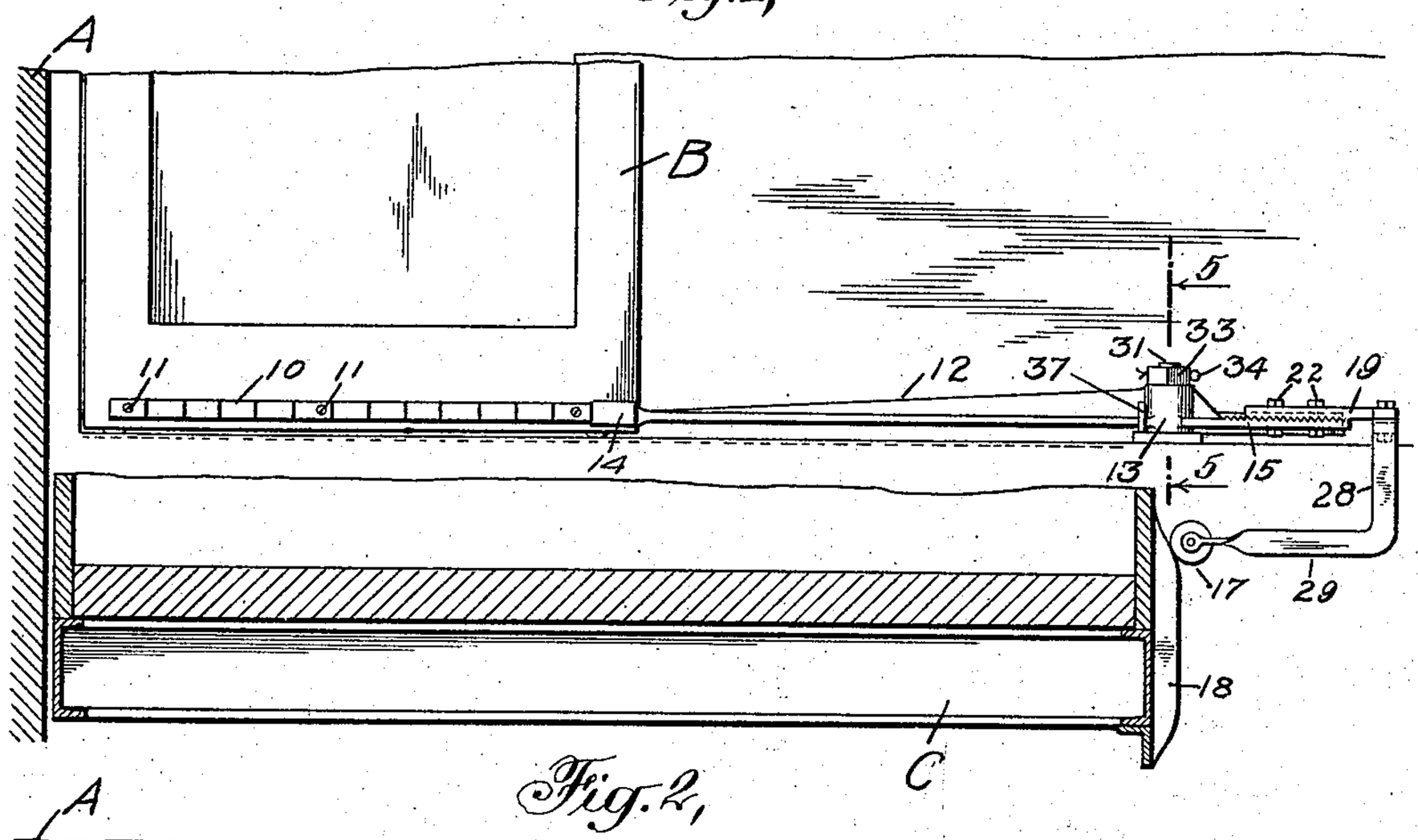


Fig. 2,

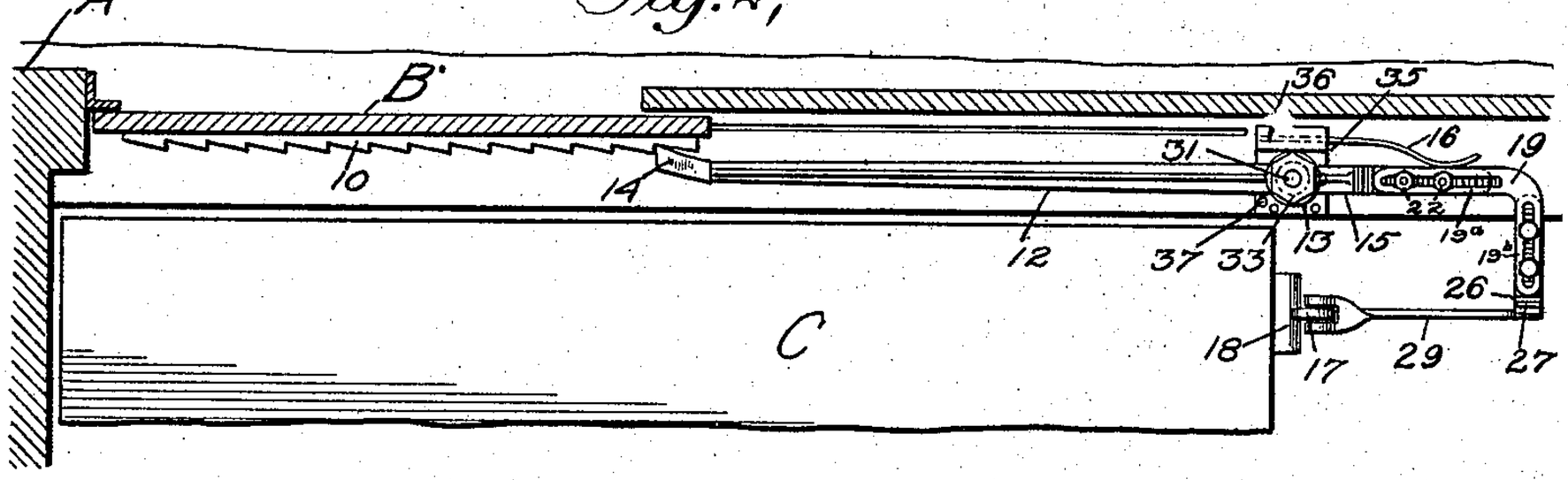
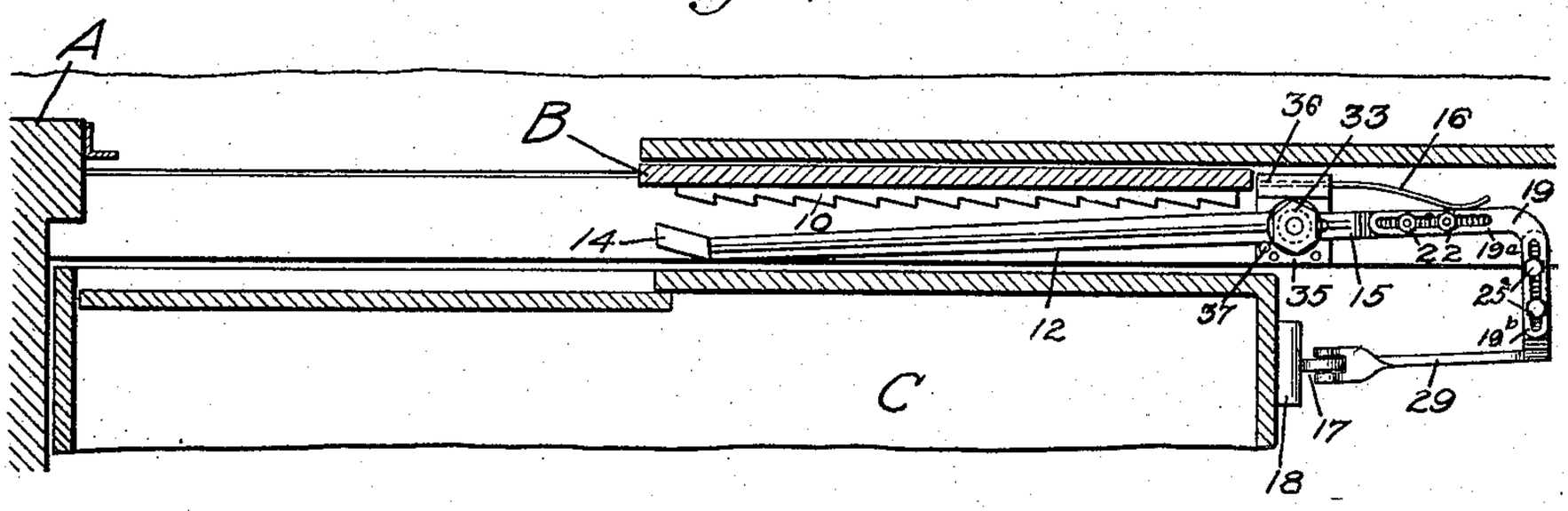


Fig. 3,



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4,

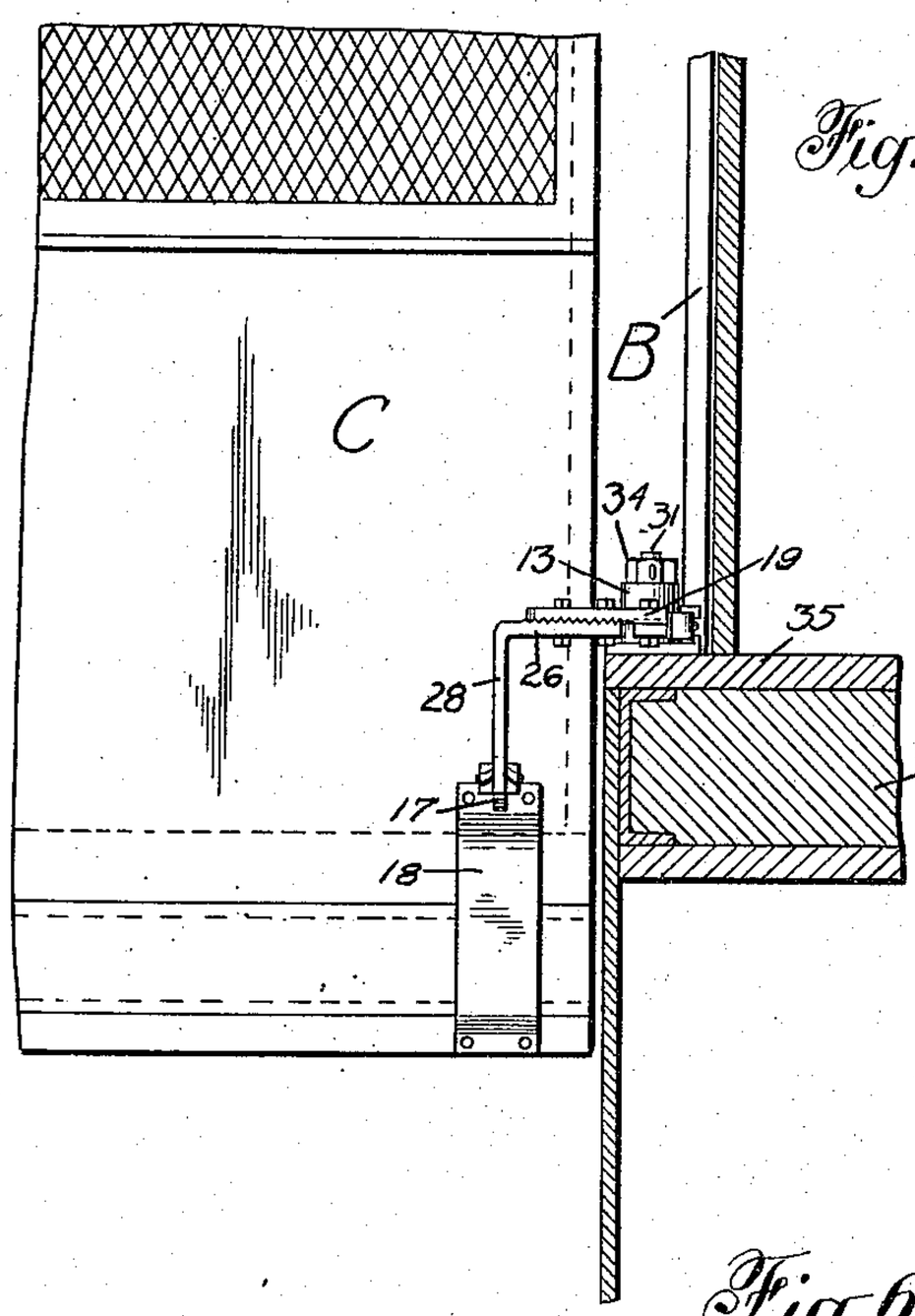


Fig. 5,

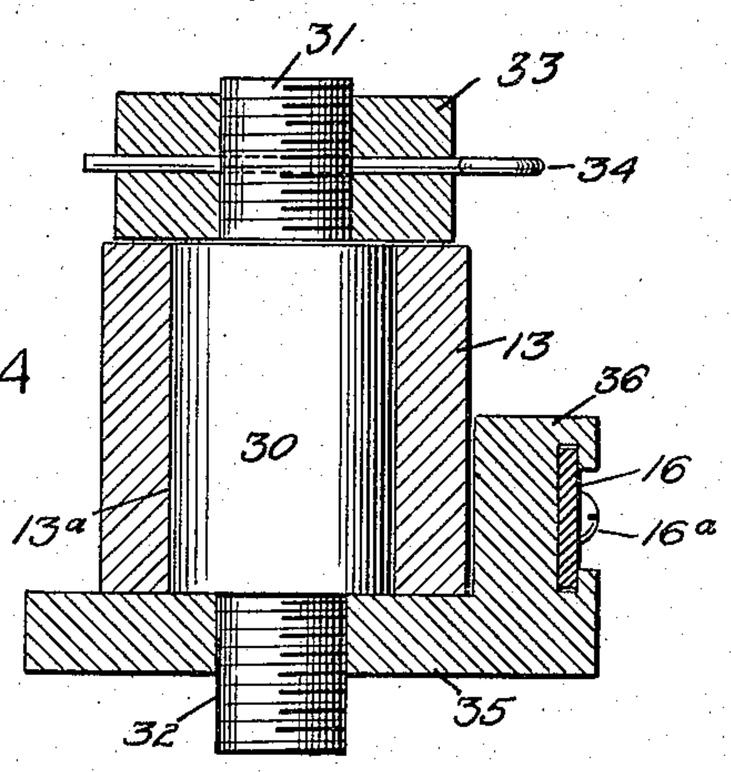


Fig. 6,

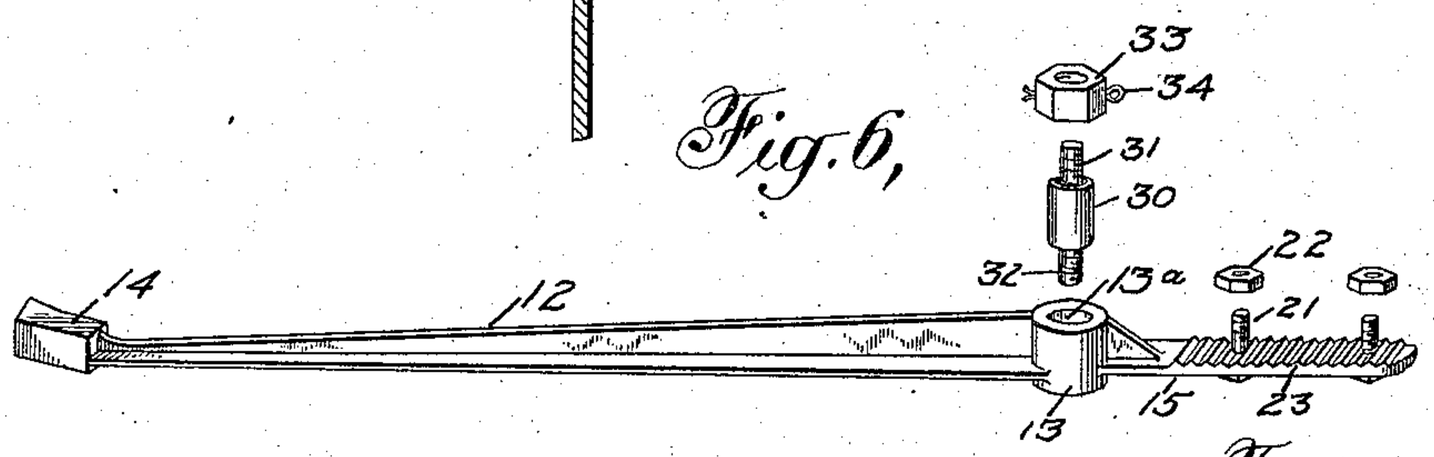


Fig. 7,

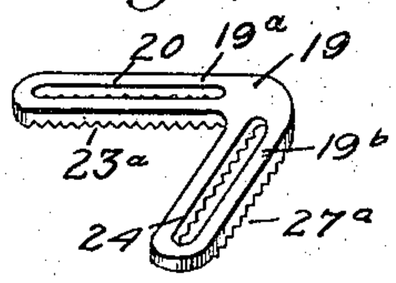
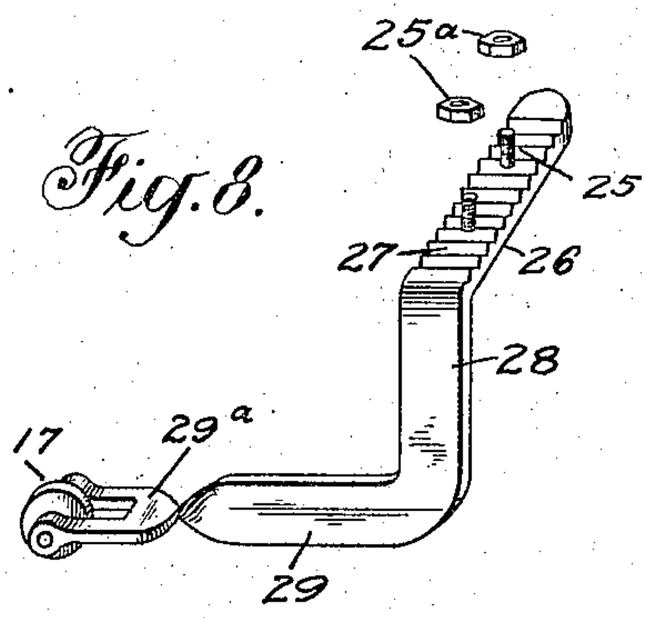


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

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SAFETY-LATCH FOR ELEVATOR-DOORS.

1,167,194. Specification of Letters Patent. **Patented Jan. 4, 1916.**

Application filed March 24, 1915. Serial No. 16,631.

To all whom it may concern:

Be it known that I, CHARLES O. MARX, a citizen of the United States, and a resident of New York city, East New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Safety-Latch for Elevator-Doors, of which the following is a full, clear, and exact description.

My invention relates to safety means for use in connection with elevator doors, to maintain the same latched except when the elevator car is at the landing to the door of which the attachment is applied.

The invention has particular reference to latch means arranged to be tripped by the car to permit the door to be manually opened or closed by the elevator attendant and to cause the automatic latching of the door at the interior as the car starts away from the landing in either direction.

The legal requirements regarding elevators, in many cases place restrictions as to the clearance space between the landing and the front of the car, and otherwise restrict freedom of construction and operation, and my invention has primarily in view to provide an automatically controlled door latch which may be readily and conveniently applied to the elevator structure, in a manner to conform to the legal requirements, regardless of variations in the particular elevator.

The invention also has for its object to provide a latch having trip means so constructed and arranged as to be readily accommodated at a side of the elevator structure, where space is available without transgressing the legal rules as to front clearance.

The invention also has for its object to provide latch means of the indicated character, improved in various particulars, to the end that efficiency in operation may be promoted, as well as economy of manufacture, convenience in effecting the assemblage of the parts, and simplicity of adjustment and control.

Reference is to be had to the accompanying drawings forming part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which:

Figure 1 is a rear view of my improved attachment applied to an elevator structure; Fig. 2 is a plan view of the attachment applied with the elevator door in the closed position and latched; Fig. 3 is a view similar to Fig. 2, but with the latch disengaged and the elevator door in the open position; Fig. 4 is an end view of my improved attachment applied; Fig. 5 is an enlarged transverse vertical section on the line 5—5 of Fig. 1; and Figs. 6, 7 and 8 are perspective views showing various elements of the latch and its trip arm.

In carrying out my invention in accordance with the illustrated example, it is understood that the elevator well A may be of any approved construction, as also the manually slidable door B, and that any approved construction of elevator car C may be employed. Applied to the door B transversely thereof at the inner side is an elongated rack 10 rigidly secured in any suitable manner, as by screws 11, whereby the rack 10 will move with the door B. An elongated latch bar 12 is formed between its ends with a pivoted hub 13 having a vertical through-bore 13ª. Means hereinafter described are provided for pivotally securing the latch bar in position. One arm of the latch bar is the longer and terminates in a forwardly disposed pawl 14 adapted to engage the rack 10. The other arm designated generally by the numeral 15 is under the influence of a spring 16 or any equivalent means tending to so rock the latch 12 as to maintain the pawl 14 in engagement with the rack.

The arm 15 constitutes a trip arm to be engaged by the car C, it being provided with a trip element 17 hereinafter more particularly referred to. In order to provide that the latch and the trip elements shall in no way trench on the clearance space between the front of the car C and the front wall of the elevator well A, the latch bar 12 ranges substantially parallel with the rack 10 transversely of the well adjacent to the front wall, while the trip elements are so formed and arranged as to be accommodated at a side of an elevator car C between the space for the latter and the adjacent side wall (not shown) of the elevator well. Furthermore, provision is made for longitudinally and rearwardly extending the trip arm 15 and its appurtenances in order to have the tripping member 17 conform to the special conditions obtaining with regard to the construction and arrangement of a particular car and elevator well.

To the ends mentioned, the arm 14 in-

cludes a separate member 19 presenting a longitudinal arm and a rearwardly extending arm at approximately right angles to each other. The longitudinal arm 19[a] is adjustable longitudinally, being provided with a longitudinal slot 20 through which extend the bolts or pins 21 that pass also through the rigid portion of the arm 15 and receive nuts 22. Mating teeth 23, 23[a] are produced on the opposed faces of the member 19 and the rigid member of the arm 15 to firmly hold the said member 19 in adjusted position. Similarly, the rearwardly extending arm 19[b] of the angular member 19 is formed with a longitudinal slot 24 and bolts or pins 25 provided with nuts 25[a] to extend through said slot 24 and through a horizontal arm 26. The opposed faces of the arm 26 and the lateral arm of the angular element 19 are provided with mating teeth 27, 27[a] so that the nuts, and bolts 25, 25[a] will serve to firmly secure the arm 26 in adjusted position. The arm 26 at its outer end has a depending member 28, the lower end of which is returned parallel with and in the same general direction as the long arm of the latch 12, the said returned member terminating in a fork 29[a] receiving the trip member 17, which preferably is a roller. Thus the returned offset member 29 and its trip or contact element 17 may be properly positioned for the said member 17 to extend into the path of a co-acting trip member 18 on the car C. Said member 18 presents a vertically curved cam surface, so that in the vertical travel of the car C the roller 17 will be tripped and moved laterally and will thus serve to rock the latch 12 to disengage the pawl 14 from the door rack 10.

The arrangement is such that the latch will be tripped by the elevator car as the latter reaches the landing. On the other hand, as the car leaves the landing and the member 18 thereof leaves the member 17 on the trip arm 15, the spring 16 will immediately throw the latch to position for the pawl 14 to engage the rack 10. Thus, should the elevator attendant close the door in a manner to cause the door to recoil slightly, the pawl 14 will nevertheless engage the rack 10 and hold the door against being further opened.

It is important to provide for readily mounting the latch 12 in position on the elevator structure and in a way to permit repairs to be made with facility and promptness, and to this end the bore 13[a] of the latch hub 13 receives a stud 30, the intermediate portion of which is unthreaded and fits the said bore. The upper end 31 and the lower end 32 of the stud are reduced and the threaded lower end 32 takes into the threaded opening in a base block 35 in the form of a small casting, the end 32 being of a length to extend through said base block 35 and into the permanent structure of the elevator well, which usually, in a modern structure, will be a metal beam, while the upper end 31 receives a nut 33 which may be secured by a cotter 34 whereby to positively prevent displacement of the latch on its pivot stud 30. The base has an upwardly extending flange 36, the rear face of which is grooved to receive the spring 16, the latter being secured by any suitable means as by a screw 16[a].

I provide suitable means to limit the rocking movement of the latch 12 so that the long arm thereof will not, from any cause, move rearwardly into the clearance provided for the elevator car. In the present instance the stop consists of a vertical pin 37 in the base 35.

It will be observed that my improved attachment may be readily applied to any structure and adjusted to any structural peculiarities thereof; moreover, repairs may be readily made without suspending the elevator service for any material length of time.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a safety device for elevators, a rack adapted to be rigidly secured to an elevator door to range transversely at the inner side thereof, a latch bar, and means to pivotally secure the latch bar between the ends thereof, in the elevator well at the front, one arm of the said latch being the longer and having a forwardly disposed pawl to engage the door rack, and a spring acting on the latch bar and tending to engage the pawl with the rack, the shorter arm of the latch bar being extended rearwardly to range in the direction of the rear wall of an elevator well between the adjacent side wall of the well and the space for the elevator car, said rearward extension having an offset returned member disposed in the same general direction as the latch bar and terminating in a member to be tripped by a car in opposition to the spring, to disengage the pawl from the rack.

2. In a safety device for elevator doors, an elongated rack bar adapted to be rigidly secured to an elevator door to range transversely thereon at the inner side; a latch bar; means to pivotally mount the latch between the ends thereof, in an elevator well at the front, adjacent to a landing, to range lengthwise with the rack, said latch having a long arm formed with a pawl; and a spring co-acting with the latch and tending to engage the pawl with the rack; the other arm of the said latch being straight with the first arm and shorter, and offset rearwardly to lie at the side of an elevator car, the rear end of said shorter arm being returned laterally in an inward direction and;

having a terminal adapted to be tripped by an elevator car at the side to rock the latch in opposition to the spring and disengage the pawl, to permit the door rack to move freely past the pawl.

3. The combination with an elevator shaft or well, a transversely sliding door therein, and an elevator car, of a safety means to control the said door, said means comprising a transverse rack on the door at the inner side, an elongated latch bar, rockably mounted at the front of the well and ranging transversely of the latter, the said latch bar presenting a longer and a shorter arm, the longer arm having a pawl adapted to engage the rack to hold the door against movement, the shorter arm of the latch having an offset returned member disposed between the adjacent side wall of the well and the space for the travel of the car, there being a spring acting on the latch and tending to engage the pawl with the rack, the said car having a trip member adapted to engage and trip the said returned member of the latch to rock the latter in opposition to the spring and thereby disengage the pawl.

4. The combination of an elevator shaft or well, a transversely sliding door therein and an elevator car, of a safety means to control said door, comprising a transversely disposed rack on the door at the inner side, an elongated latch bar rockably mounted at the front of the well and ranging transversely of the latter, the said latch bar having a longer arm formed with a pawl to engage the rack, and with a shorter arm disposed at the rear of the first arm between the adjacent side wall of the well and the space for the travel of the car, said shorter arm having a member extending into the path of movement of the adjacent side surface of the car to be tripped by the latter.

5. In a safety device for elevator doors, a rack adapted to be secured to an elevator door to range transversely at the inner side thereof, an elongated latch bar, means to pivotally mount the latch bar between its ends in an elevator well, a spring pressing on said latch bar, one arm of the bar having a pawl adapted to engage the rack, the other arm of the bar being returned and offset in the rear of the first arm, to be received in an elevator well at a side of the car, the second arm of the bar being extensible lengthwise of the bar and transversely thereof.

6. In a safety device for elevator doors, a rack adapted to be secured to an elevator door to range transversely at the inner side thereof, an elongated latch bar, means to pivotally mount the latch bar between its ends in an elevator well, a spring pressing on said latch bar, one arm of the bar having a pawl adapted to engage the rack, the other arm of the latch having an angular member adjustably secured thereto, said angular member presenting a downward extension terminating in a trip member disposed in the same general direction as the first arm of the latch to be tripped by an elevator car for rocking the latch against the pressure of the spring and disengaging the pawl.

7. In a safety device for elevator doors, a rack adapted to be secured to the elevator door to range transversely at the inner side thereof, an elongated latch bar having a hub between the ends thereof, the said hub presenting a vertical through-bore, the latch at one side of the hub presenting an arm constituting a pawl and the latch at the opposite side presenting an arm to be tripped by an elevator car, a base on which the hub of the latch seats, a vertical stud having threaded ends, and having an intermediate unthreaded portion fitting the bore of the latch hub, the lower end of the stud taking into the said base, retaining means to prevent displacement of the latch on the hub while permitting it to rock, and a spring held on the base and acting on the latch to engage the pawl with the rack.

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

CHARLES O. MARX.

Witnesses:

ELEANOR SPITZFADEN,

AUGUST F. ENGELHARDT, JR.