

F. M. EVANS.

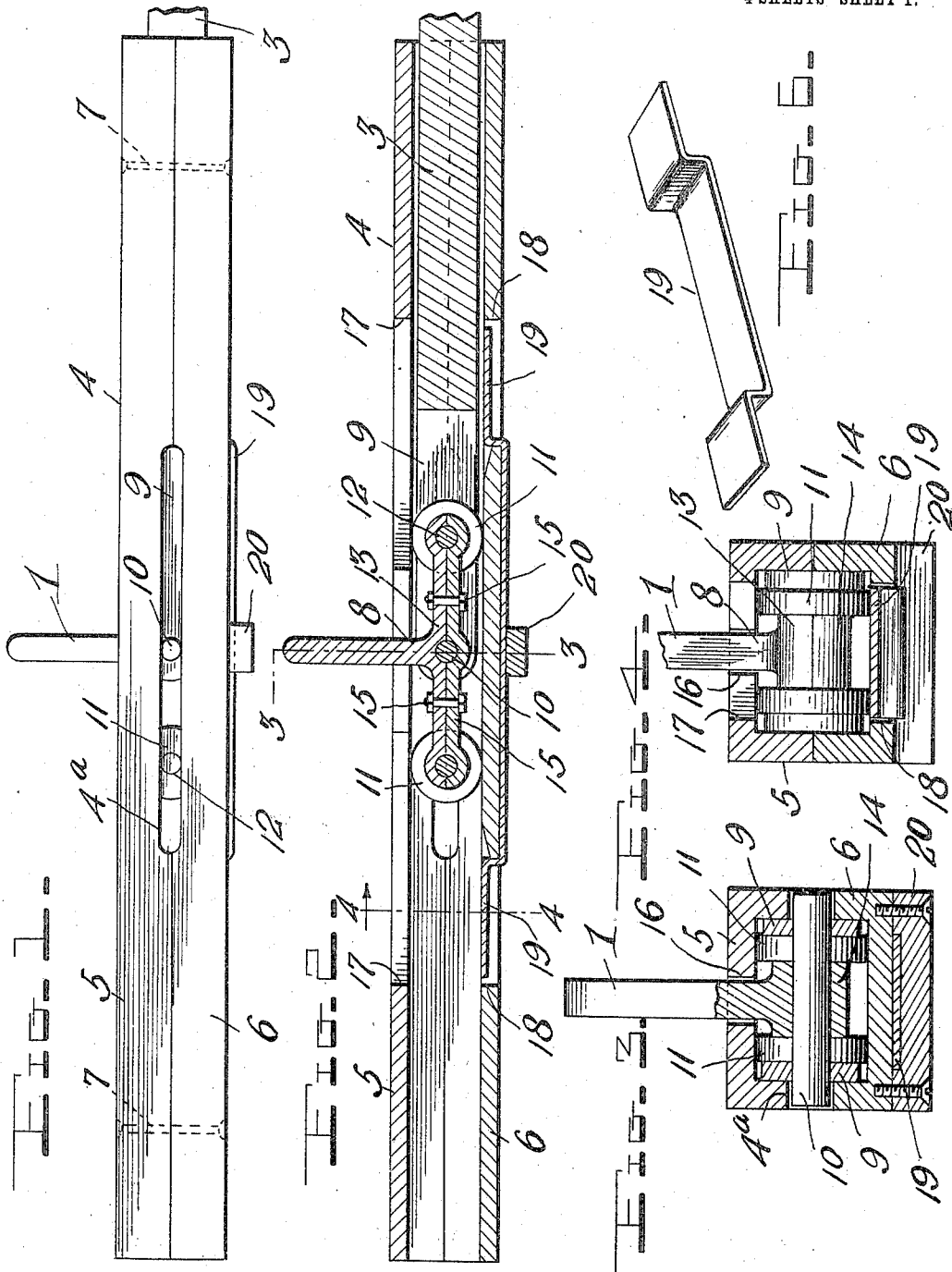
TRIP DEVICE FOR OPERATING RAILWAY SWITCHES, TRAP DOORS, &c.

APPLICATION FILED JUNE 10, 1909.

947,896.

Patented Feb. 1, 1910.

4 SHEETS—SHEET 1.



WITNESSES

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C. M. Ricketts

INVENTOR

Francis M. Evans

By Walter E. Coleman Attorney

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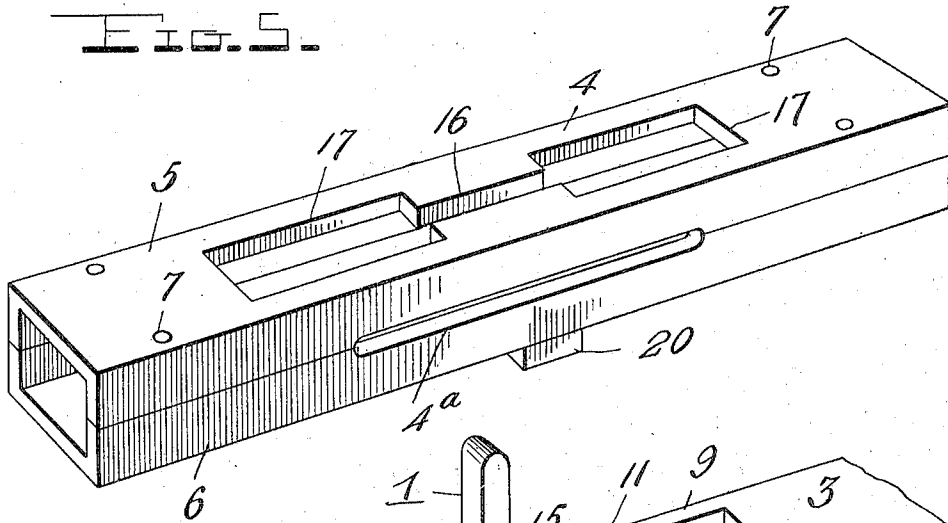
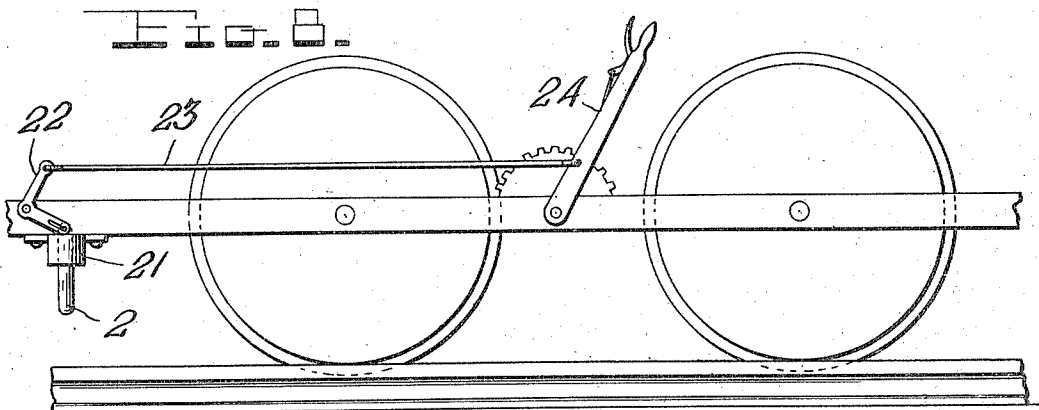
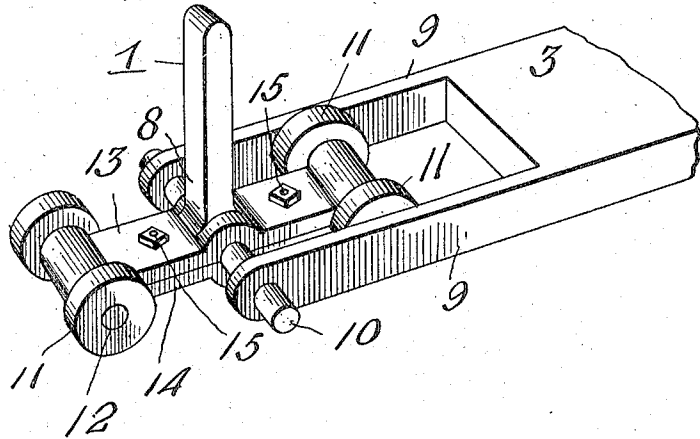


FIG. 7.



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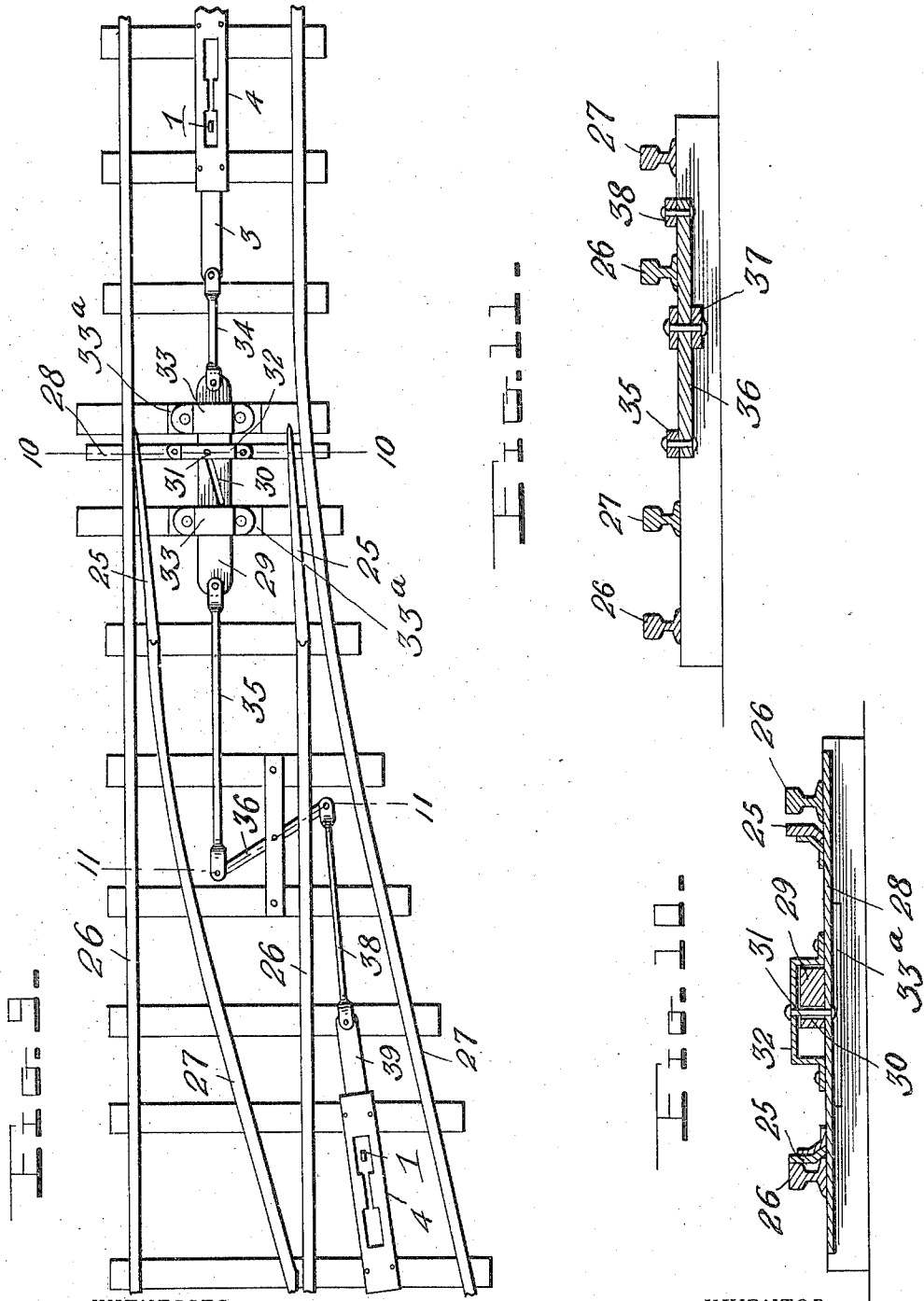
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WITNESSES

INVENTOR

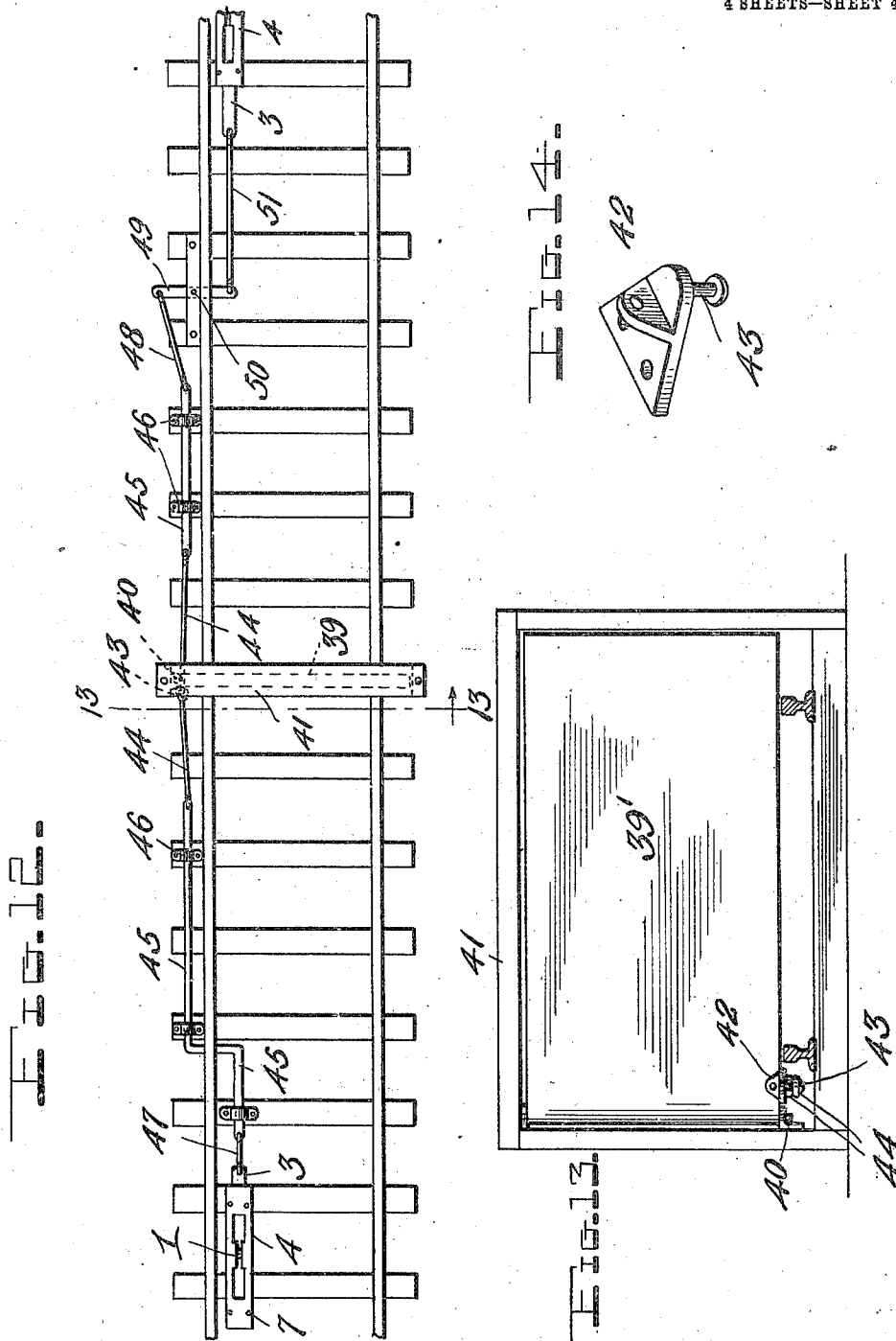
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4 SHEETS—SHEET 4.



WITNESSES
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UNITED STATES PATENT OFFICE.

FRANCIS MARION EVANS, OF IVY, KENTUCKY.

TRIP DEVICE FOR OPERATING RAILWAY-SWITCHES, TRAP-DOORS, &c.

947,896.

Specification of Letters Patent.

Patented Feb. 1, 1910.

Application filed June 10, 1909. Serial No. 501,382.

To all whom it may concern:

Be it known that I, FRANCIS M. EVANS, a citizen of the United States, residing at Ivy, in the county of Bell and State of Kentucky, have invented certain new and useful Improvements in Trip Devices for Operating Railway-Switches, Trap-Doors, &c., of which the following is a specification, reference being had to the accompanying drawings.

This invention is an improved trip device for use on railways for throwing switches, operating trap doors and for performing analogous functions.

The object of the invention is to provide a simple and practical mechanism of this character which will be reliable and efficient in operation and which may be actuated by a car or train passing in either direction over the track.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the trip device; Fig. 2 is a longitudinal section; Figs. 3 and 4 are transverse sections; Fig. 5 is a perspective view of the casing; Fig. 6 is a similar view of the spring; Fig. 7 is a perspective view of the trip arm and slide which carries it; Fig. 8 is a detail view showing an operating device to be used on a car, locomotive or the like for actuating the trip arms; Fig. 9 is a plan view of a railway track showing the main line and siding and the switch adapted to be operated by the improved trip device; Figs. 10 and 11 are transverse sections taken on the plane indicated by the lines 10—10 and 11—11 in Fig. 9; Fig. 12 is a plan view of a railway track showing a horizontally swinging trap door or gate arranged upon the same and adapted to be operated by my improved trip device; Fig. 13 is a transverse section taken on the plane indicated by the line 13—13 in Fig. 12; and Fig. 14 is a detail view of the bracket attached to the door.

In the drawings 1 denotes a trip arm adapted to be arranged along a railway track and to project into the path of a retractable operating device 2 carried by a car, locomotive or the like passing over the track. The trip arm or member 1 is carried

by a slide 3 arranged in a guiding and supporting casing 4 secured longitudinally of the track and preferably on the cross ties between the track rails. The casing 4 is preferably constructed of two superposed channeled sections 5, 6 united by vertical fastenings 7 and having the slide 3 arranged for longitudinal movement between them. The trip arm 1 projects upwardly from a vertically tilting member 8 disposed horizontally between the spaced arms 9 of a forked or bifurcated inner end of the slide 3 and it is arranged on a transverse pivot pin 10, the ends of which latter project into guide grooves or slots 4^a formed in the opposite sides of the casing 4 to limit the longitudinal movement of the slide 3. To permit the block or carriage 8 to slide freely on the bottom of the casing 4, pairs of anti-friction rollers 11 are journaled on transverse pivots 12 and arranged in recesses in the four corners of the carriage 8. The shafts or pivots 12 are clamped in the reduced ends of the carriage 8 by making the latter of upper and lower sections 13, 14 and uniting them by fastenings 15, the arm 1 being formed integral with the upper section 13. Said arm 1 projects through a longitudinal slot 16 formed in the top of the casing 4, the ends of said slots being enlarged, as shown at 17, to permit the carriage or member 8 to tilt. The bottom of the casing 4 beneath the end 17 of the slot 16 is also open, as shown at 18, for the same purpose and to restore the carriage 8 to its normal horizontal position springs 19 are arranged in the openings 18. These springs are preferably formed from one piece of resilient metal by bending its ends, as shown in the drawings, and securing its central portion upon the bottom of the casing 4 by means of a cross strip 20.

By constructing and mounting the trip arm 1 in the manner above described, it will be seen that when it is engaged by the moving actuating arm or member 2 on a car or the like, it will be slid longitudinally from one end to the other of said slot in the casing and when it reaches the last mentioned end will tilt downwardly to permit the member 2 to pass over it. The slide 3 has its end connected by a suitable means to a switch point, trap door or other object or device which is to be operated by the mechanism. It will be noted on reference to Fig. 2 that when the carriage or block 8

is at either end of the slot in the casing 4 the outer end of such carriage will be disposed on one end of the spring 19 while its inner end will rest upon the solid portion of the bottom of the casing so that the carriage can tilt in but one direction, hence when an actuating member 2 moving in the opposite direction engages the arm 1 it will slide the carriage, and hence the slide 3, to the other end of the slot in the casing.

While any suitable means may be provided on the cars, locomotives or other vehicles which pass over the track for the purpose of actuating the trip arm 1, a retractable member such as shown in Figs. 8 is preferably carried on cars and locomotives. This arm 2 is in the form of a vertically slidable bar arranged in a guide 21 on a car or vehicle and connected to one arm of a bell crank 22, which latter has its other arm connected by a link 23 to an adjustable operating lever 24. By means of this lever the arm 2 may be lowered or raised. While I preferably employ a retractable operating member 2, it will be understood that in some instances such member 2 may be made stationary so as to always actuate the arm 1 when it passes the same.

In Figs. 9 and 10 I have shown the invention applied for operating the points 25 of the switch arranged in a main line 26 and a siding 27. These points are connected to a transverse slide bar 28 which is actuated by a longitudinal slide bar 29 having a diagonal or cam slot 30 to receive a vertical pin 31 rising from the bar 28 and having its upper end supported by an inverted U-shaped bracket 32. The slide 29 is mounted in similar guide brackets 33. The slide 29 rests upon metal plates 33^a arranged on the cross ties beneath the brackets 33. One end of the slide 29 is connected by a link 34 to the outer end of the slide 3 of one of the trip devices arranged in the main line. Another of these trip devices is arranged in the casing and has its slide 3 connected by a link 35 to a transverse lever 36 pivoted at its center in a bearing 37 and having its other end connected by a link 38 to the other end of the slide 39. The operation of this switch throwing mechanism will be readily understood from the foregoing description.

In Figs. 11 and 12 of the drawings I have shown the improved trip mechanism adapted for opening and closing a trap door such as used in mines or a railway gate. This door or gate 39' is hingedly mounted on one side, as shown at 40, on a suitable frame 41 so as to swing transversely across the track and upon its bottom adjacent to its hinged end is a bracket 42 having a depending pin 43 connected to links 44 which extend in opposite directions and are loosely connected to longitudinal slide bars 45 arranged in bearings 46. One of the slide bars 45 has an off-

set portion 47 and its extremity is connected to the slide 3 of one of the trip devices. Another of the trip devices is arranged on the other side of the door and has its slide 3 connected by a link 48 to a transverse lever 49 pivoted at its center, as shown at 50, and having its other end connected by a link 51 to the other slide bar 45. It is thought that the operation of this mechanism will be readily understood from the foregoing description taken in connection with the drawings. It will be understood that the two trip devices will be suitably distant from the door so that the door will be opened before the car reaches it and will not be closed until after the car has passed through the door.

While I have shown and described the preferred embodiment of the invention in detail, it will be understood that various changes may be made within the spirit and scope of the invention and it will also be understood that my invention may be used in other ways than the two above set forth and shown in the drawings.

Having thus described the invention what is claimed is:

1. In a trip device of the character described, the combination of a movable actuating member, a trip carried by said member and movable independently thereof, and means for maintaining the trip in fixed relation with respect to said member until the latter reaches a predetermined point in its movement.

2. In a trip device of the character described, the combination of a movable actuating member, a tiltable trip carried thereby and means for guiding said trip and preventing it from tilting until it reaches the limit of the movement of the actuating member in one direction.

3. In a trip device of the character described, the combination of an actuating slide, a tiltable trip arm mounted on said slide, and means for guiding said slide and the trip arm whereby the latter will be prevented from tilting until the slide reaches the limit of its movement in one direction.

4. In a trip device of the character described, the combination of an actuating slide, a tiltable trip arm mounted on said slide, means for guiding said slide and the trip arm whereby the latter will be prevented from tilting until the slide reaches the limit of its movement in one direction and means for restoring the trip arm to its normal position when released.

5. In a trip device of the character described, the combination of a casing, an actuating slide therein, a tiltable trip arm carried by said slide and a spring for restoring the trip arm to its normal position after being tilted.

6. In a trip device of the character described, the combination of a casing, an

actuating slide therein, a tiltable trip arm carried by said slide, means for limiting the movement of the actuating slide, means for preventing the tiltable trip arm from tilting until the slide reaches the limit of its movement in one direction and means for restoring the arm to its normal position after being tilted.

7. In a trip device of the character described, the combination of a casing having in its top a longitudinal slot and in its bottom openings opposite the ends of said slot, an actuating slide in said casing, a tiltable arm carried by said slide and extending through the slot in the top of the casing, the ends of the base portion of said tiltable trip arm being adapted to extend over the openings in the bottom of the casing and springs in said openings in the bottom of the casing to restore the trip arm to normal position after being tilted.

8. In a trip device of the character described, the combination of a casing having in its top a longitudinal slot and in its bottom openings opposite the ends of said slot, an actuating slide in said casing, said slide and casing having a slot and pin connection to limit the movement of said slide, a car-

riage pivotally mounted on the slide and having anti-friction rollers to engage the bottom of the casing, a trip arm rising from and projecting through the slot in the top of the casing, the ends of said carriage being adapted to extend over the openings in the bottom of the casing and springs in said openings in the bottom of the casing for returning the trip arm to its normal position after being tilted.

9. The combination with a vehicle carrying an actuating member, of a track for the vehicle, a movable element upon the track, a tiltable trip, an actuating member carrying said trip, operative connections between said actuating member and said movable element, and means for guiding said tiltable trip when engaged and actuated by the actuating member on the vehicle, whereby the trip will be prevented from tilting until the actuating member which carries it reaches the limit of its movement in one direction.

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

FRANCIS MARION EVANS.

Witnesses:

H. H. FUSON,
BERRY P. HOWARD.