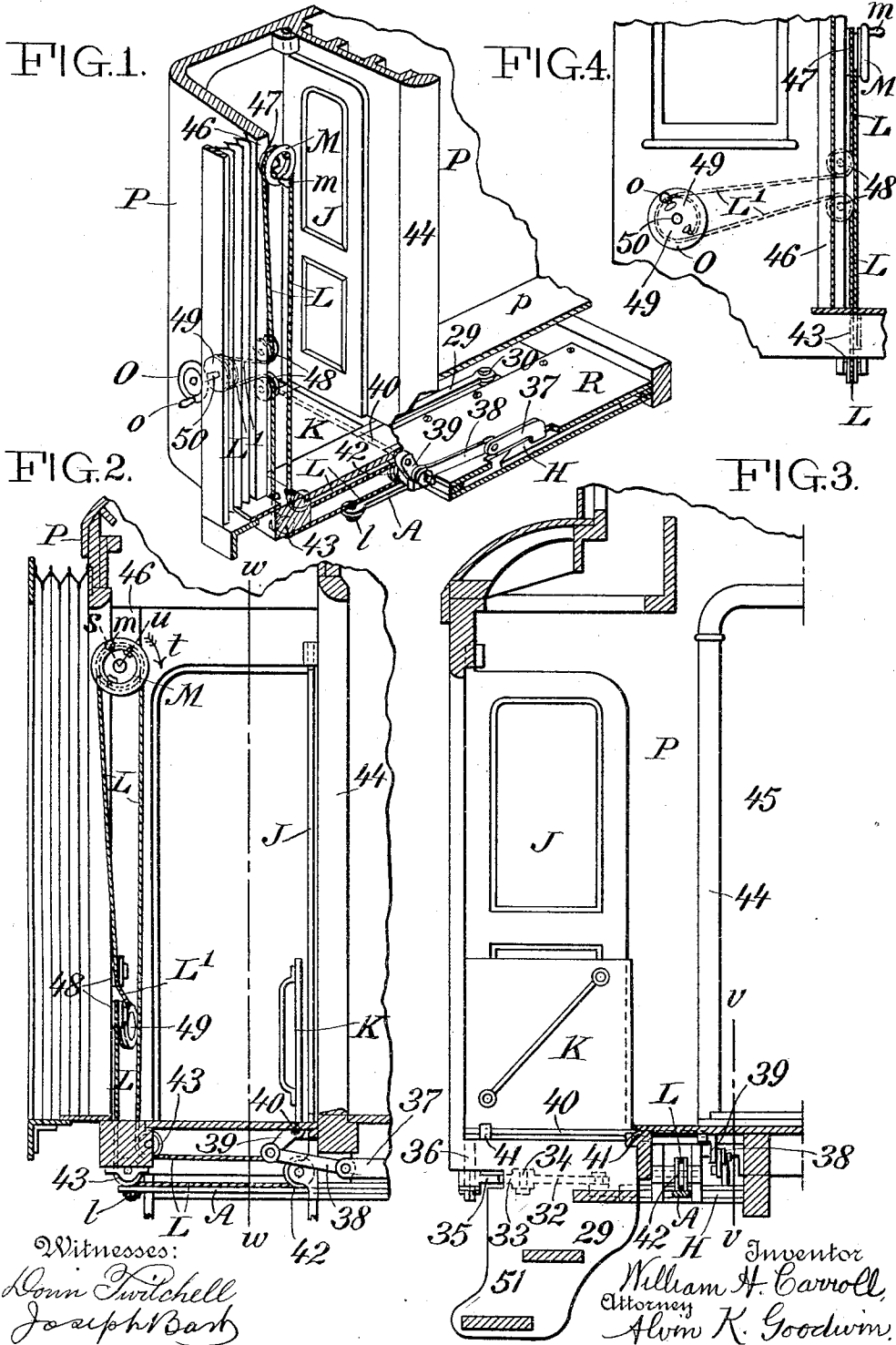


W. H. CARROLL.
RAILWAY CAR VESTIBULE DOOR AND TRAP.
APPLICATION FILED AUG. 3, 1912.

1,056,149.

Patented Mar. 18, 1913.

5 SHEETS—SHEET 1.



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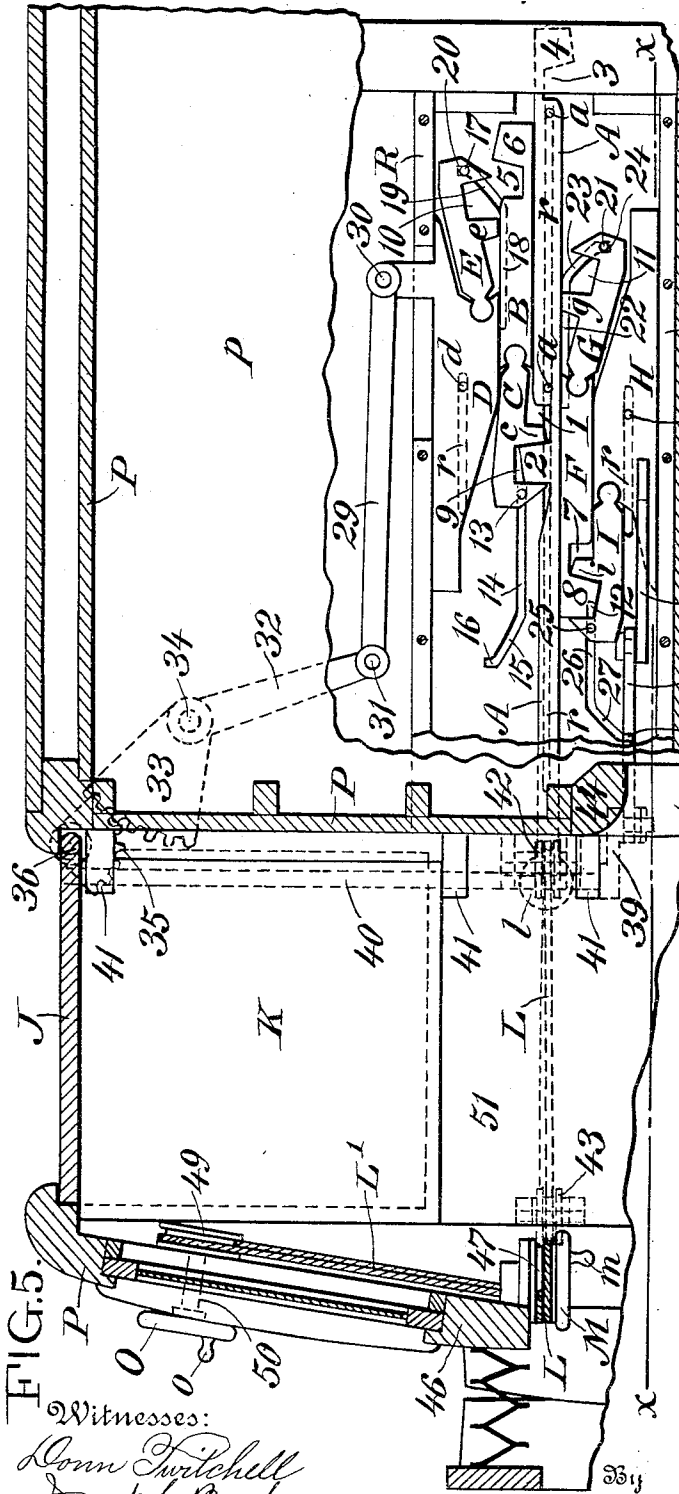


FIG. 5.

Witnesses:

Conrad Twitchell
Joseph Barb

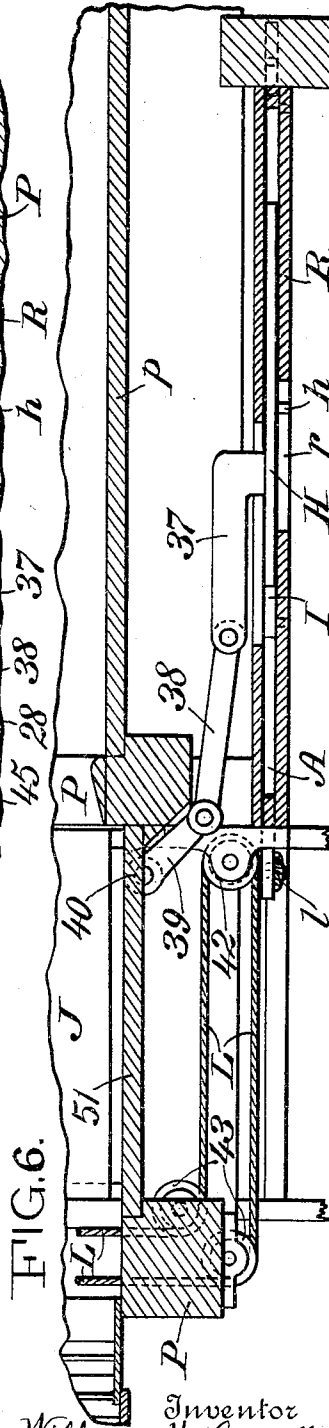


FIG. 6.

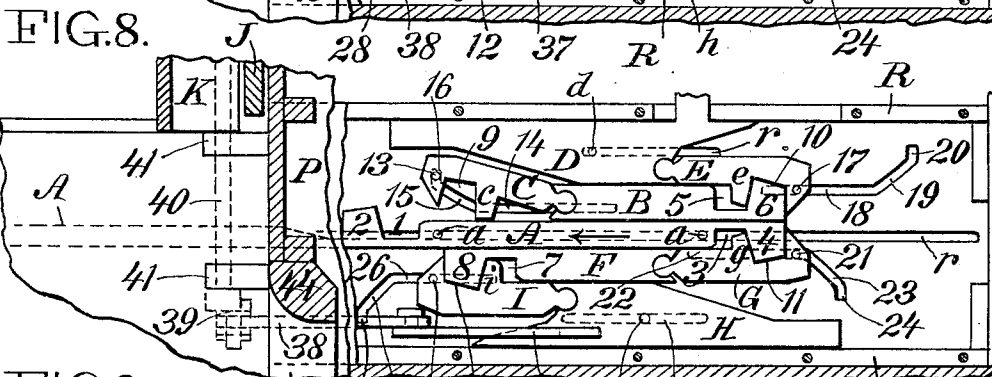
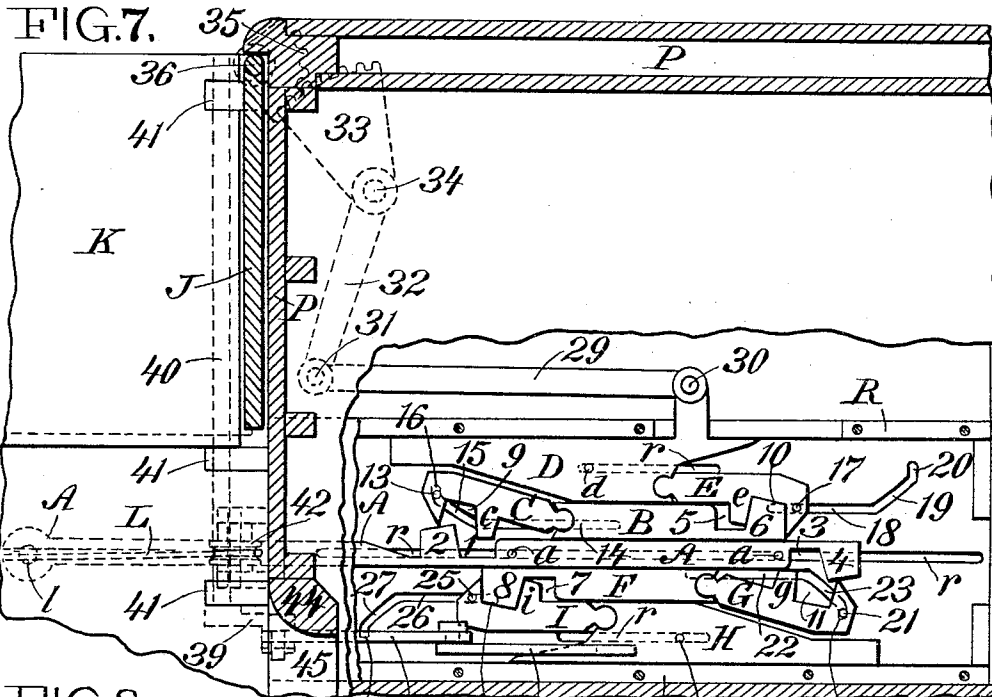
Inventor
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Attorney
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5 SHEETS—SHEET 3.



Witnesses:
Donn Twitchell
Joseph Barb

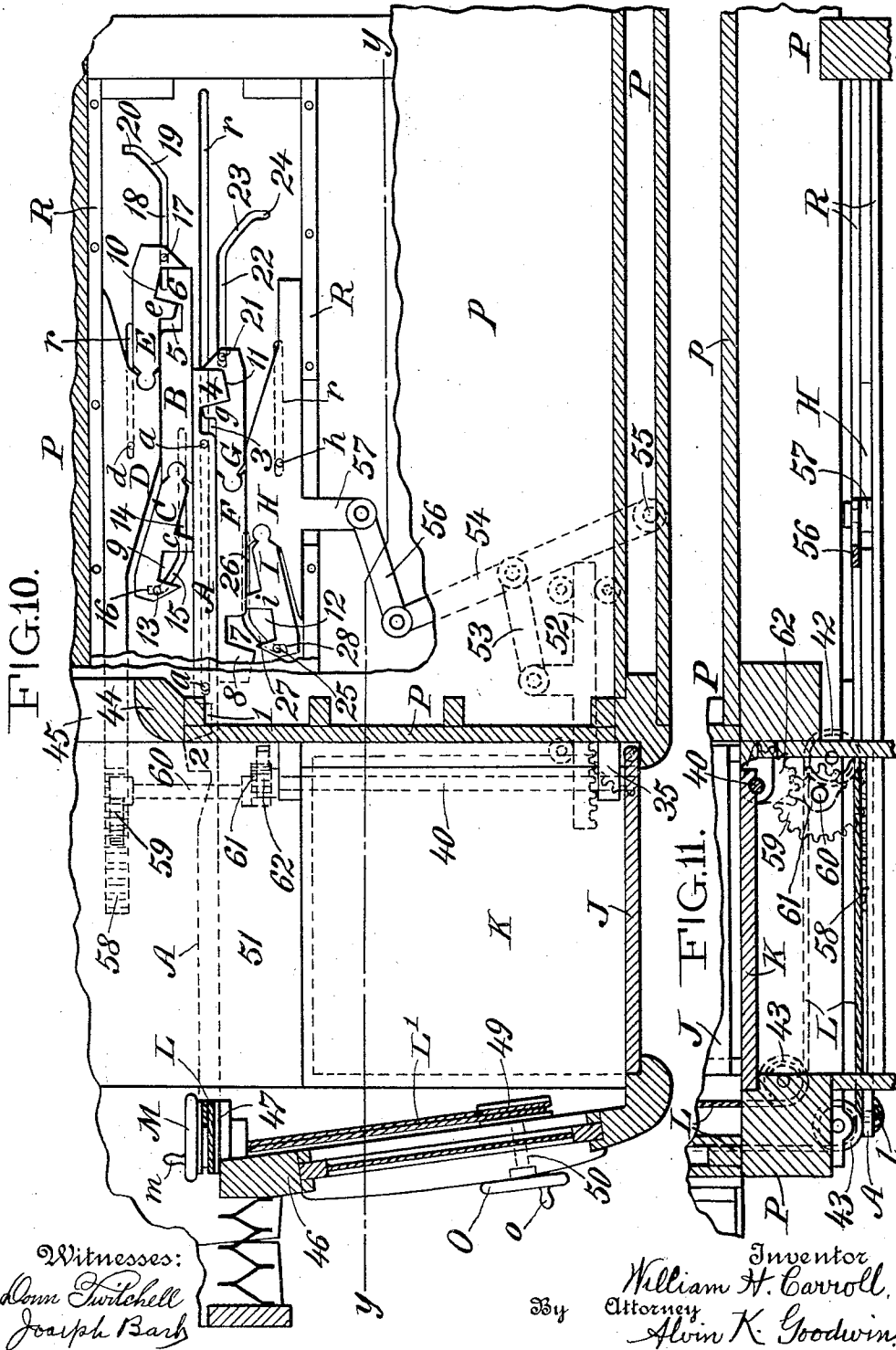
Inventor
William H. Carroll
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5 SHEETS—SHEET 4.



Witnesses:
Dann Twitchell
Joseph Barb

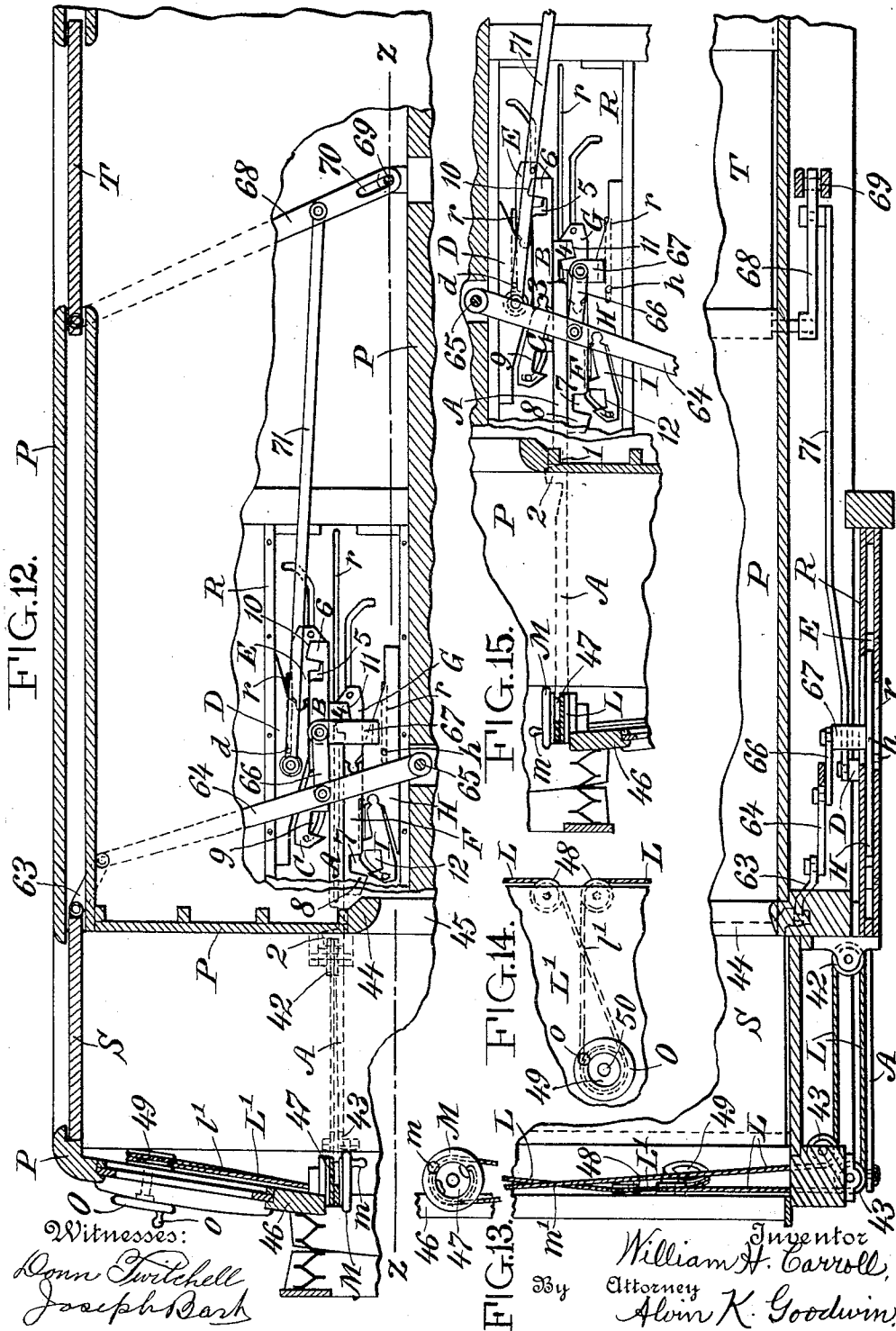
Inventor
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5 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

WILLIAM H. CARROLL, OF JERSEY CITY, NEW JERSEY.

RAILWAY-CAR-VESTIBULE DOOR AND TRAP.

1,056,149.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed August 3, 1912. Serial No. 713,136.

To all whom it may concern:

Be it known that I, WILLIAM H. CARROLL, a citizen of the United States of America, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Railway-Car-Vestibule Doors and Traps, of which the following is a specification.

This invention relates to improved mechanism designed more especially for opening and closing the outside doors and step-covering traps of railway cars as may be necessary to permit exit and entrance of passengers at stations having either high or low platforms, but the invention is applicable for operating any two independent structures requiring successive going and return movements, or requiring that one of the two structures be given going and return movements while the other structure remains at rest.

The invention embodies improvements in mechanism of similar class described in my concurrent patent application having Serial Number 651,967, and has for its more special objects to dispense with springs in the door and trap operating traveler and slide mechanism while providing simple and efficient locking means on the traveler and slides for locking the door and trap in any open or closed positions to which they may be adjusted when operating the traveler preferably by an endless cable actuated by a trainman standing on the car platform or standing on the roadbed or elsewhere outside the car.

The invention will first be described and then will be particularly defined in claims hereinafter set forth.

Reference is made to the accompanying drawings forming part of this specification, and in which—

Figure 1 is a broken sectional perspective view of the left hand portion of the rear platform of a vestibuled railway car showing a hinged door open and a hinged trap closed. Fig. 2 is a detail longitudinal vertical section with both door and trap open, the section of the traveler and slide mechanism and connections being taken on the line $v-v$ in Fig. 3. Fig. 3 is a transverse vertical section taken on the line $w-w$ in Fig. 2. Fig. 4 is a detail sectional end elevation more especially showing auxiliary means for operating the door and trap from

outside the car. Fig. 5 is a sectional plan view showing both door and trap closed. Fig. 6 is a vertical longitudinal section on the line $x-x$ in Fig. 5. Figs. 7, 8, 9, are sectional plan views illustrating different relative adjustments of parts of the traveler and slide mechanism during operation of the car door and trap. Fig. 10 is a sectional plan view specially showing modified forms of connections from the traveler and slide mechanism for operating a hinged door and trap at the right hand portion of the rear car platform. Fig. 11 is a vertical longitudinal section on the line $y-y$ in Fig. 10. Fig. 12 is a sectional plan view showing modified connections successively operating an end platform sliding door and a central side sliding door. Fig. 13 is a vertical section on the line $z-z$ in Fig. 12. Fig. 14 is a detail end elevation showing the crossed cable operating from outside the car the mechanism illustrated in Figs. 12 and 13, and Fig. 15 is a detail sectional plan view showing an uncrossed cable actuating sliding door mechanism at the opposite side of the car. Figs. 10 to 15 illustrate how the connections may be arranged to always open and close the car doors and traps at opposite sides of the car and by similar standard easily remembered rotative movements of the hand wheels shown for operating the cable connected traveler and slide mechanism.

First referring more particularly to Figs. 1 to 9 of the drawings, the letter A indicates the reciprocatory traveler. B is a primary slide carrying a pivoted hook C, and D is an adjoining secondary slide carrying a pivoted hook E, both slides B, D, being arranged at one edge or side of the traveler. At the opposite edge or side of the traveler are arranged two similar primary and secondary slides F, H, respectively carrying pivoted hooks G, I, these nine simple parts A to I constituting a traveler and slide mechanism adapted through suitable connections to open and close a car door J, and step-covering trap K, when the traveler is reciprocated by any suitable means such as as endless cable L. This cable is operated by a hand wheel M, journaled on an upright of the car platform frame, and preferably also by a hand wheel O journaled on the end of the car body and operative from outside the car by a trainman standing on

the station platform or at the side of the railway track. This mechanism A, to I, is arranged to work within a protecting casing R, secured flatwise underneath the floor *p* of the car body P, and the traveler A, projects from this casing at one end to permit its connection at *l* to one side of the cable L. The reciprocatory traveler A, and the two outer slides D, H, may respectively have fixed pins *a*, *d*, *h*, running in straight guiding slots *r* formed in the casing R, and the two slides B, F, are guided edgewise between opposite edges of the traveler A, and slides D, H, respectively.

The traveler A has at one edge a notch 1, next which is a lug 2, and at its opposite edge the traveler has another notch 3 and an adjacent end lug 4, said lugs 2, 4, projecting laterally beyond respective opposite sides or edges of the traveler. The primary slide B at its outer edge has a notch 5 and an adjacent end lug 6, and the primary slide F, at its outer edge has a notch 7 and an adjacent end lug 8, said lugs 6, 8, projecting laterally beyond adjacent edges of the slides B, F. Each pivoted hook C, E, G, I, is broadened at its outer part to give room laterally for formation in the hook C, of a notch 9, next the inner wall of which is a locking lug *c*, and for formation in the hook E, of a similar inner edge notch 10 next which is a locking lug *e*, and the hook G has a similar edge notch 11 next which is a locking lug *g*, and the hook I has a similar edge notch 12 next which is a locking lug *i*. The hook C at its outer end has a pin 13 which slides in a suitable guide shown as a slot formed in the casing R, and having a straight part 14, an inclined part 15, and an end part 16 which is about at right angle to the slot part 14. The hook E, at its outer end carries a pin 17 which slides in a guide slot having a straight part 18, an inclined part 19 and an end part 20 which is about at right angle to the slot part 18. The hook G at its outer end carries a pin 21 which slides in a guide slot having a straight part 22, an inclined part 23 and an end part 24 which is about at right angle to the slot part 22, and the hook I at its outer end carries a pin 25 running in a guide slot having a straight part 26, an inclined part 27, and an end part 28 which is about at right angle to the slot part 26. The hooks C, E, G, I, necessarily move with the respective slides B, D, F, H, and are in effect portions of said slides.

Figs. 1 to 9 of the drawings show that a rod 29, pivoted at 30 to a lug on the secondary slide D, is pivoted at 31 to an arm 32 rigid on a segment gear 33 fulcrumed at 34 to the car body. This gear 33 engages a segment gear 35 fixed to the lower rigid vertical hinge pintle 36 of the car door J, for opening and closing the door. To the

other secondary slide H, is fixed a lug 37 pivotally connected by a link 38 to an arm 39 rigidly fixed to the horizontal hinge bar 40 journaled in bearings 41 on the car platform frame and so fixed to the trap K that when said bar 40 is turned one-quarter around and back, the trap will be opened and closed. The cable L passes around lower pulleys 42, 43, which guide its lower horizontal bight and direct its vertical bight upward along an upright of the car frame which may be the post 44 at the outside of the main end doorway 45 of the car body, but said vertical cable bight is intentionally passed upward next the extreme outer end upright 46 of the car platform in order to prevent interference of the cable or of its operator with exit or entrance of passengers at the main car doorway 45. Said vertical cable bight is fixed to an upper pulley 47 which fixedly carries the cable operating wheel M which has a handle *m* for turning it. Should it be desired to use an outside operating wheel O, having a handle *o*, one side of the vertical bight of cable L is carried laterally over guide pulleys 48, in an auxiliary bight or loop *L'*, which passes around and is fixed to an inside pulley 49 whose shaft 50 is journaled in the car platform frame and fixedly carries said wheel O which thus is accessible from outside the car.

Before briefly describing the modifications shown in Figs. 10 to 15 of the drawings, the operation of the above named parts shown in Figs. 1 to 9 will be described as follows, presuming that the wheel M is used to actuate the cable L from the car platform.

In Figs. 2, 3, the door J and trap K are both open at which time the handle *m* of wheel M stands on the radial line *s*, in Fig. 2, and to which position the handle had been turned downward and to the right hand in direction of arrow *t*, from the position at the radial line *u*, where the handle *m* stood when both the door and trap were closed as shown in Figs. 5 and 6. To close the open door and trap the wheel handle *m* is turned downward toward the left hand in reverse direction of the arrow *t*, for less than one revolution or until the handle *m*, again stands on the radial line *u*.

Assuming that the door J and trap K are both closed as in Figs. 5 and 6, and that the train is approaching a station having a platform on a level with the closed trap K, said trap is to remain closed to allow passengers to walk over it after the door J is opened. To thus open the door the handle *m*, of wheel M is turned from radial line *u* in direction of arrow *t*, nearly half-way around to the position of Fig. 1. This carries the cable-connected traveler A to the left hand from the position of Fig. 5 to the position of Figs. 1 and 7, with the following

results. Fig. 5 shows that at the beginning of this left hand movement the traveler lug 2 is within the notch 9 of the hook C of the primary slide B, and is held there by the hook pin 13 now in the straight part 14 of the adjacent guide slot while at this time the pin 17 of hook E on the secondary slide D, is locked within the outer part 20 of the adjacent guide slot by the hook lug *e* resting against the edge of the slide B a little behind its notch 5, whereby the door J is securely locked closed by the traveler and slide mechanism itself and independently of locking devices acting on or with the cable L, such as are shown in my prior companion application No. 651,967. As the traveler A begins its left hand movement its lug 2 now engaged in the notch 9 of the hook C, draws this hook and the coupled primary slide B with it until the slide notch 5 opposes the lug *e* of the hook E of secondary slide D. The door J is unlocked when the lug 6 of moving slide B, strikes the hook lug *e*, and moves the pin 17 of hook E out of the part 20 of the adjacent guide slot and into the inclined portion 19 of said slot which then swings the hook E inward and carries its lug *e* into the notch 5 of slide B, and fully engages the slide lug 6 with the notch 10 of hook E. Continued left-hand movement of the traveler A, by the engagement of its lug 2 with the hook C, will now draw the slide B and hook E with it and the hook E necessarily moves the slide D with it while the hook pin 17 moves along the straight part 18 of its guide slot, as indicated in Fig. 7. Meanwhile the pin 13 of the hook C had moved along the straight part 14 of the adjacent guide slot and outward along the inclined slot part 15 and into the locking slot part 16, whereby the notch 9 of hook C had been disengaged from the lug 2 of the moving traveler A, and when the traveler notch 1, passes the hook lug *e*, the end of this lug will bear against the adjacent edge of the traveler A to hold the hook pin 13 in the slot part 16 and thus securely lock the door J open, to which open position the door had been adjusted by movements of the indirect-acting connections 29 to 35 between the door pintle 36 and the moving secondary slide D. As the trap is to remain closed the traveler A is moved to the left-hand but slightly farther than is shown in Fig. 7, to allow the hook lug *c* to finally lock against the edge of traveler A, behind its notch 1 to confine the hook pin 13 in the slide-locking slot part 16, as in Fig. 8. After the passengers have left and entered the car at this station having a platform level with the closed trap K, the open door J is again to be closed. This is done by simply turning the wheel M back to the left-hand or in reverse direction of the arrow *t*, from the position of Fig. 1, until

its handle *m*, again stands at the radial line *u*, in Fig. 2, and during this action the traveler and slide mechanism operates as follows. Left-hand turning of wheel M draws the traveler A toward the right-hand. The lug 6 of slide B, now is fully engaged with the notch 10 of hook E, and the traveler A need move but slightly to the right-hand to bring its lug 2 against the lug *c* of the hook C whose pin 13 now will move out of the locking slot part 16, and as said pin moves along the cam slot portion 15, the hook lug *c* will enter the traveler notch 1, and the lug 2 of traveler A will be fully engaged with the notch 9 of hook C, which will cause said hook and the coupled slide B to move with the traveler. As the slide lug 6 already engages the notch 10 of hook E, said hook and the coupled slide D will be moved to the right-hand and will cause reverse movements of the indirect-acting connections 29 to 35, to close the now unlocked car door J. Toward the end of said right-hand movements of the parts A, B, C, D, E, the pin 17 in hook E, rides from the guide slot part 18 along the cam slot part 19 and into the locking slot part 20, thereby disengaging the notch 10 of hook E from the slide lug 6, and a slightly further right-hand movement of traveler A, which is still engaged with the hook C, carries the slide B forward until its edge portion just behind the notch 5 stands next the hook lug *e*, and thus prevents withdrawal of the hook pin 17 from the slot part 20, thereby securely locking the door J closed, and all parts now are returned to relative positions shown in Figs. 5 and 6 of the drawings, with the door and trap both closed and locked.

Should the train next approach a station having a low platform requiring passengers to leave and enter by the car platform steps 51 shown in Fig. 3, both the door J and trap K must be opened as shown in Figs. 2 and 3. As the door swings open above the closed trap, the door must be opened before the trap is opened, and the trap must be closed before the door is closed. The opening of the door by a limited left-hand movement of the traveler A, carrying the parts B, C, D, E, from the positions of Fig. 5, to those of Fig. 7, has been hereinabove described leaving it necessary only to explain in detail the relative movements of the slides and hooks F, G, H, I, at the opposite edge of the traveler, and with more special reference to Figs. 7, 8 and 9 of the drawings. When the door J is locked open by the pin hook 13 held in guide slot part 16 by contact of hook lug *c*, with the adjacent edge of the traveler A, the latter has moved a little farther to the left-hand than is shown in Fig. 7, and in Fig. 8 the traveler has continued its left-hand movement for nearly one-half the additional distance required

to open the trap K, hence Fig. 8 desirably shows the transitory relative adjustments of parts during the opening of the trap K, or the intermediate adjustments while the traveler A is moving from the position of Fig. 7 to the final or full left-hand position of Fig. 9. Soon after the lug *c* of hook C, rides onto the edge of the moving traveler A behind its notch 1, to lock the door J open, the traveler lug 4 strikes the lug *g* of hook G and swings this hook inward thereby drawing its pin 21 from the trap locking part 24 of the adjacent guide slot and then along the cam slot part 23 into the straight slot part 22, and causing full engagement of the traveler lug 4 with the notch 11 of hook G, whereby said lug 4 now moves this hook and the primary slide F with it, and as the lug 8 of slide F, is now held engaged with the notch 12 of the hook I while the hook pin 25 moves along the straight part 26 of the adjacent guide slot, the secondary slide H is now moved toward the left-hand by the engaged traveler and slide parts A, G, F, I, while the slide parts B, C, D, E, remain at rest and meanwhile the open door J, is kept locked by contact of the hook lug *c* with the moving traveler A. The direct-acting connections 37 to 40 between slide H, and trap K, assure that while the traveler is moving from the position of Fig. 7 to that of Fig. 9, the trap is swung open upward, it being partially opened in Fig. 8, and fully open in Fig. 9. As the traveler A was about completing its left-hand movement the pin 25 of hook I passed from the straight guide slot part 26 and through the cam slot part 27 into the locking slot part 28 whereby the hook I was thrown back to disengage its notch 12 from the lug 8 of slide F, and the traveler finally moves a little farther to the left-hand to carry the outer edge of slide F behind its notch 7, in front of the lug *i* of hook I, to securely lock the trap K, open, and substantially as the door J was and is locked open by the hook lug *c* acting directly on the traveler A. The wheel M now had been turned in direction of arrow *t* to the position on the radial line *s*, shown in Fig. 2, and all parts have relative positions shown in Figs. 2, 3, and 9 of the drawings.

After the train leaves the low-platform station the trap K, and door J, must be closed and this is done by turning the wheel M in reverse direction of the arrow *t*, as its handle *m*, moves from the radial line *s* to the radial line *u* in Fig. 2. The notch 11 of hook G now engages the traveler lug 4, as in Fig. 9, and as the traveler A is moved to the right-hand by the connected cable L, the pin 21 of hook G runs along the straight part 22 of the adjacent guide slot, and when the lug 8 of slide F, strikes the lug *i* of hook I, it swings said hook inward thereby dis-

engaging the hook pin 25 from the locking slot part 28, and said pin then moves in the cam slot part 27, which swings the hook notch 12 into full engagement with the lug 8 of slide F, and the hook pin 25 next moves along the straight slot part 26, while the hook I carries slide H with it to the right-hand and slide H, operates the direct-acting connections 37 to 40, to close the trap K, at about the time the pin 21 of hook G had passed from the inclined slot part 23 into the locking slot part 24, thereby disengaging the notch 11 of the now outmoved hook G, from the lug 4 of traveler A, and a slightly farther right-hand advance of the traveler moves its edge portion lying behind the notch 3, opposite the lug *g*, thereby locking the hook pin 21 in the slot part 24 to prevent further right-hand movement of the hooks G, I, and slides F, H, and to securely lock the trap K closed, but leaving the traveler A free to make further right-hand movement to the final position shown in Figs. 5 and 6, for closing and locking the door J, by action of the hooks E, C, and slides B, D, in manner hereinbefore fully explained. If after closing the trap K, by partial right-hand movement of the traveler A, it should be desired to at once reopen the trap, this may be done by moving the traveler from intermediate position to its extreme left-hand position shown in Figs. 2 and 9. It thus appears that by this improved traveler and slide mechanism and suitable connections from the two secondary slides D, H, to the door J, and trap K, either the door or trap may be opened or closed, and locked at either open or closed adjustments, independently of each other as circumstances may require. The door or trap, or other single structure, may be given going and return movements and be locked by traveler and slide mechanism including primary and secondary slides operating at only one edge or side of the traveler. The outside wheel O is necessarily turned by the cable L when the cable is operated by the wheel M, and the handles *o*, *m*, of both wheels describe similar arcs of movement during like operation of the door J, and trap K. Any other means, such as levers fulcrumed to the car and coupled to the cable, or pneumatic or electric connections to the traveler, may be used for operating the traveler and primary and secondary slide mechanism in manner hereinbefore described.

The door and trap should always be opened or closed by similar easily remembered standard rotative movements of the cable operating wheel M, or O, whether the door and trap be at the left or right side of a car platform, or whether an end sliding door and an intermediate side sliding door are to be opened or closed at opposite sides

of a car by this traveler and slide mechanism. It is therefore deemed best to show in Figs. 10 to 15 of the drawings certain modifications of connections from the traveler and slide mechanism to such differently arranged doors or traps and to briefly describe such connections.

In Figs. 10 and 11, the slide H, operates the door J, by direct-acting connections comprising a guided rack bar 52 which engages the door pintle segment gear 35, and is coupled by a link 53 to a lever 54 fulcrumed at 55 to the car body and in turn coupled by a link 56 to a lug 57 fixed to slide H. The trap K, is actuated from the slide D, by indirect-acting connections comprising a rack bar 58, carried by slide D, and engaging a segment gear 59 fixed to a countershaft 60, which carries a reversely arranged segment gear 61, engaging a segment gear 62, fixed to the hinge shaft 40 of the trap K. This is a reverse arrangement of connections from that shown in Figs. 1 to 9, wherein the door J is operated from the slide D, and the trap K, from the slide H, and in Figs. 10 and 11, the door and trap are closed by a left-hand movement of the traveler A, and are opened by its right-hand movement, which also is the reverse of the traveler action in Figs. 1 to 9, wherein the door and trap are opened by left-hand movement of traveler A, and are closed by its right-hand movement. By thus arranging the connections in Figs. 10 and 11, the door J will always be opened before the trap is opened, and the open trap will always be closed before the door is closed, and while the cable-operating wheels M, O, turn to the right or left hand through the same standard arcs of movement as are required for operating the door and trap in Figs. 1 to 9, at the opposite side of the car.

Figs. 12 to 14 show how the same traveler and slide mechanism A to I, is adapted to open the end sliding door S, before the intermediate side sliding door T, is opened, and to close the door T before the door S is closed, the door opening being effected by right-hand movement of traveler A, which moves to the left-hand while closing them. The platform door S is coupled by a link 63, to one end of a lever 64 fulcrumed at 65 to the car body P, and in turn coupled by a link 66 to a lug 67 fixed to the secondary slide H. The side door T is coupled to one end of a lever 68 the other end of which has a pin-and-slot connection at 69—70, with the car body. A rod 71 connects the lever 68 to the other secondary slide D. With these connections 63 to 71, it is necessary to cross the main vertical bight of the cable L at m' , and to cross at v' the lateral cable bight L' , leading to the outside operating wheel O, in order that the wheels M, O, shall turn through the same standard arcs of

movement as are required for opening or closing the car door and trap previously described.

Fig. 15 is introduced simply to indicate that when sliding doors S and T are arranged at the opposite car side from that shown in Figs. 12, 13, 14, both doors will be closed by their connections 63 to 71, while the traveler A moves to the left-hand, and will be opened as the traveler moves to the right-hand, by turning the wheel M or O, through the known standard arcs of movement to properly operate the here uncrossed cable L.

In view of the aforesaid detailed description of relative movements of parts of the traveler and slide mechanism during unlocking and opening and closing and locking the car door and trap shown in Figs. 1 to 9, it is deemed unnecessary to repeat detailed statements of substantially similar operations of the traveler and slide mechanism shown in Figs. 10 to 15, which will readily be understood without further explanation. The scale of Figs. 12 to 15 being materially reduced in order to include the side doors T, in Figs. 12 and 13, it was deemed inadvisable to attempt to numerically indicate the four slide hook pins and all parts of the four guide slots in which the pins move during operation of the traveler and slides, as the identity and coaction of these pins and slots will be clearly evident from the above detailed description of the operation of similar parts shown in Figs. 1 to 9 of the drawings.

I claim as my invention:—

1. In mechanism of the character described, the combination of a reciprocatory traveler, a primary slide and a secondary slide, the traveler and primary slide having mutually engaging and releasing shoulders whereby the primary slide is actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slide is actuated by the primary slide, connections from the secondary slide to a structure to be operated, and means actuating the traveler.

2. In mechanism of the character described, the combination of a reciprocatory traveler, a primary slide and a secondary slide, the traveler and primary slide having mutually engaging and releasing shoulders whereby the primary slide is actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slide is actuated by the primary slide, connections from the secondary slide to a structure to be operated, means actuating the traveler, and means locking the secondary slide and the structure operated by it.

3. In mechanism of the character de-

scribed, the combination of a reciprocatory traveler, primary and secondary slides at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to one structure to be operated, connections from the other secondary slide to another structure to be independently operated, and means actuating the traveler.

4. In mechanism of the character described, the combination of a reciprocatory traveler, primary and secondary slides at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to one structure to be operated, connections from the other secondary slide to another structure to be independently operated, means actuating the traveler, and means locking the secondary slides and the structures operated by them.

5. In mechanism of the character described, the combination of a reciprocatory traveler having a projecting lug, a primary slide next the traveler and having a projecting lug, a hook pivoted to the primary slide and having a notch and an adjacent locking lug, a secondary slide next the primary slide, connections from the secondary slide to a structure to be operated, a hook pivoted to the secondary slide and having a notch and an adjacent locking lug, pins on the hooks, and relatively stationary guides engaging the hook pins and having straight, inclined and right-angular portions whereby the primary and secondary slide hook notches are respectively engaged with the traveler and primary slide lugs and are at proper times disengaged therefrom and when so disengaged the hook pins enter the right-angular guide portions and the locking lugs of the primary and secondary slide hooks rest respectively against the traveler and primary slide and lock the secondary slide and the structure operated thereby at the end of both going and return movements of said structure.

6. In mechanism of the character described, the combination of a reciprocatory traveler having at respective opposite edges two projecting lugs, two primary slides arranged one next each edge of the traveler and each having a projecting lug, a hook pivoted to each primary slide and having a

notch and an adjacent locking lug, two secondary slides arranged next the primary slides, connections from said secondary slides respectively to two structures to be independently operated, a hook pivoted to each secondary slide and having a notch and an adjacent locking lug, pins on the primary and secondary slide hooks, and relatively stationary guides engaging the hook pins and having straight, inclined and right-angular portions whereby the primary and secondary slide hook notches are respectively engaged with the traveler and primary slide lugs and are at proper times disengaged therefrom and when so disengaged the hook pins enter the right-angular guide portions and the locking lugs of the primary and secondary slide hooks rest respectively against the traveler and primary slides and lock the secondary slides and the two structures operated thereby at the end of both going and return movements of said structures.

7. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, and means actuating the traveler.

8. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, means actuating the traveler, and means locking the secondary slides and consequently locking the connected door and trap at open and closed adjustments.

9. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler having at respective opposite edges two projecting lugs, two primary slides arranged one next each edge of the traveler and each having a projecting lug, a hook

pivoted to each primary slide and having a notch and an adjacent locking lug, two secondary slides arranged next the primary slides, connections from said secondary slides respectively to the car door and trap for opening and closing them, a hook pivoted to each secondary slide and having a notch and an adjacent locking lug, pins on the primary and secondary slide hooks, relatively stationary guides engaging the hook pins and having straight, inclined and right-angular portions whereby the primary and secondary slide hook notches are respectively engaged with the traveler and primary slide lugs and are at proper times disengaged therefrom and when so disengaged the hook pins enter the right-angular guide portions and the locking lugs of the primary and secondary slide hooks rest respectively against the traveler and primary slides and lock the secondary slides and consequently lock the connected door and trap at open and closed adjustments.

10. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, an endless cable coupled to the traveler and running to the car platform, and means at said platform actuating the cable.

11. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, an endless cable coupled to the traveler and running beside an upright of the car vestibule frame, and a hand wheel journaled to said upright and coupled to the cable for operating it by a trainman on the car platform.

12. In mechanism of the character described, the combination with a car vestibule

door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, an endless cable coupled to the traveler and running beside an outer upright of the car vestibule frame, and means sustained by said upright and coupled to the cable for operating it by a trainman on the car platform and not interfering with exit and entrance of passengers.

13. In mechanism of the character described, the combination with a car vestibule door and trap, of a reciprocatory traveler, primary and secondary slides arranged at each edge of the traveler, the traveler and primary slides having mutually engaging and releasing shoulders whereby said primary slides are actuated by the traveler, and the primary and secondary slides having mutually engaging and releasing shoulders whereby the secondary slides are actuated by the primary slides, connections from one secondary slide to the car door and from the other secondary slide to the trap for opening and closing said door and trap, an endless cable coupled to the traveler and running to the car platform, means at said platform actuating the cable, said cable having a laterally extended loop or bight, and means engaging said lateral cable bight and operative outside the car to actuate the traveler and slide mechanism therefrom.

14. In mechanism of the character described, the combination with a car vestibule door and trap, of traveler and slide devices and connections therefrom to the door and trap, of an endless cable coupled to the traveler and running to the car platform, means at said platform actuating the cable, said cable having a laterally extended loop or bight, and means engaging said lateral cable bight and operative outside the car to actuate the traveler and slide mechanism therefrom.

15. In mechanism of the character described, the combination with a reciprocatory traveler A, having a projecting lug 2, of a primary slide B, having a notch 5, and lug 6, a hook C, pivoted to slide B, and having a notch 9, adapted to engage the traveler lug 2, and an adjacent locking lug c, adapted to bear on the traveler; a secondary slide D, next the slide B, a hook E, pivoted to slide D, and having a notch 10, adapted to engage the lug 6, of slide B, and an adjacent lock-

ing lug *e* adapted to bear on slide B, said hooks C, E, respectively having pins 9, 17; a relatively stationary guide 14, 15, 16, for the hook pin 9, and a relatively stationary
 5 guide 18, 19, 20, for the hook pin 17, means reciprocating the traveler, and connections from the slide D, to a structure to be operated.

16. In mechanism of the character described, the combination with a reciprocatory traveler A, having projecting lugs 2, 4, of a primary slide B, at one edge of the traveler and having a notch 5 and lug 6, a hook C, pivoted to slide B, and having a notch 9,
 15 adapted to engage the traveler lug 2, and an adjacent locking lug *e*, adapted to bear on the slide B, a hook E, pivoted to slide D, and having a notch 10, adapted to engage the
 20 lug 6, of slide B, and an adjacent locking lug *e*, adapted to bear on slide B, said hooks C, E, respectively having pins 9, 17, a relatively stationary guide 14, 15, 16, for the

hook pin 9, and a relatively stationary guide 18, 19, 20, for the hook pin 17; a primary
 25 slide F, at the opposite edge of the traveler A, and having a notch 7, and lug 8, a hook G, pivoted to slide F, and having a notch 11, adapted to engage the traveler lug 4, and an adjacent locking lug *g*, adapted to bear on
 30 the traveler; a secondary slide H, next the slide F, a hook I pivoted to slide H, and having a notch 12, adapted to engage the lug 8, of slide F, and an adjacent locking lug 7, adapted to bear on slide F, said hooks G, I,
 35 respectively having pins 21, 25, a relatively stationary guide 22, 23, 24, for the hook pin 21, and a relatively stationary guide 26, 27, 28, for the hook pin 25, means reciprocating the traveler, and connections from the slides
 40 D, H, respectively to two structures to be independently operated.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."