

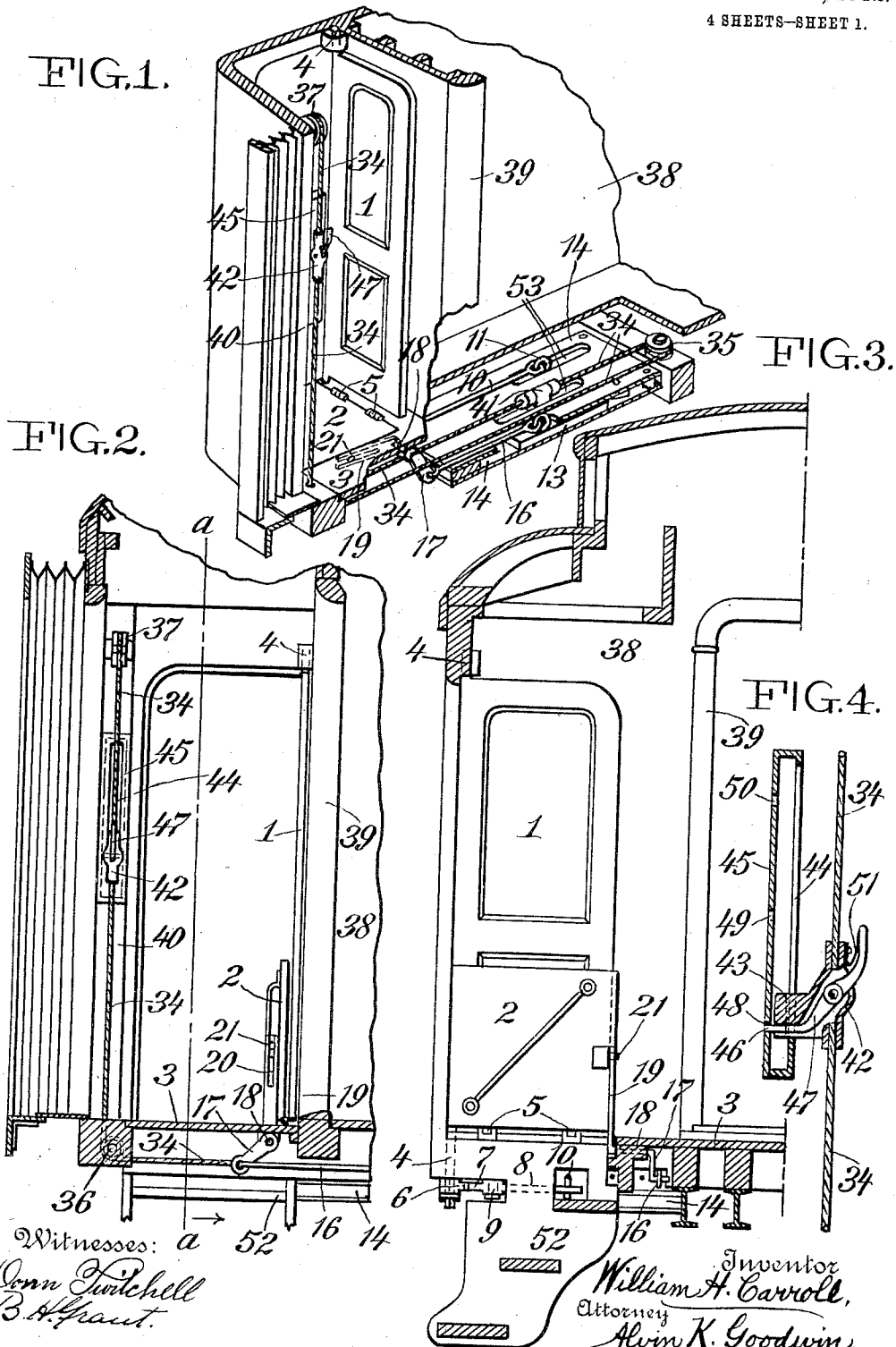
W. H. CARROLL.
RAILWAY CAR VESTIBULE DOOR AND TRAP.
APPLICATION FILED SEPT. 29, 1911.

1,044,487.

Patented Nov. 19, 1912.

4 SHEETS-SHEET 1.

FIG. 1.



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4 SHEETS—SHEET 2.

FIG. 5.

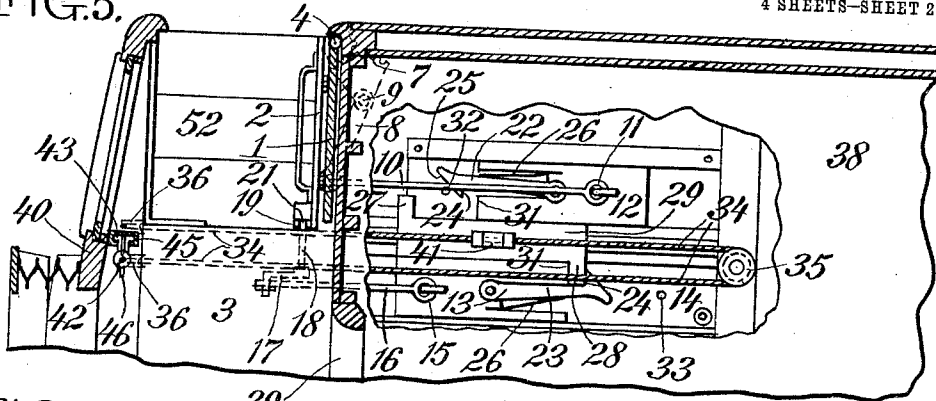


FIG. 6.

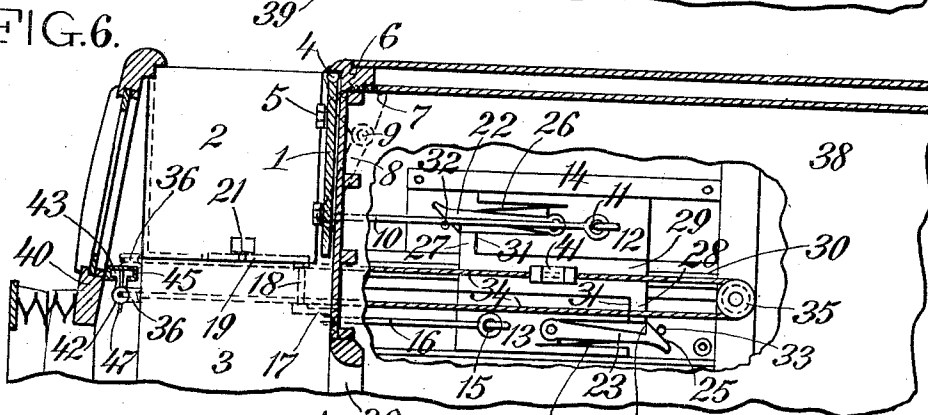


FIG. 7.

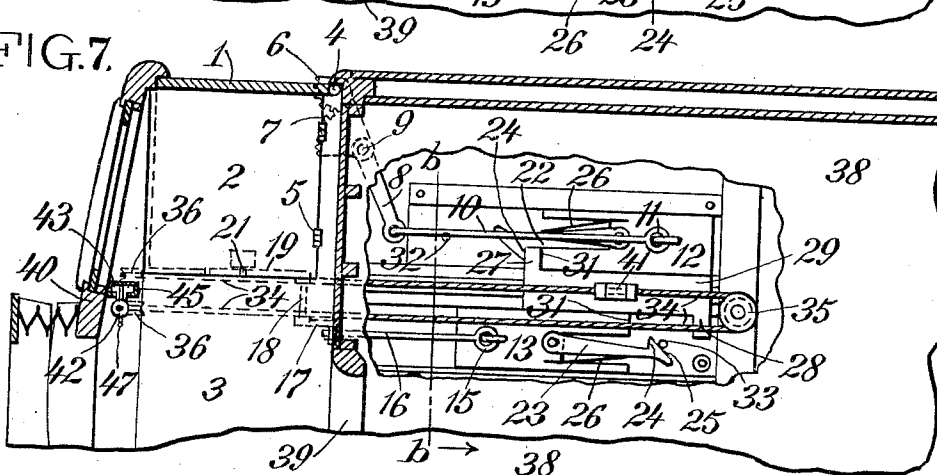
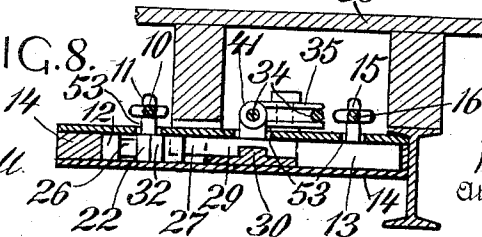


FIG. 8.



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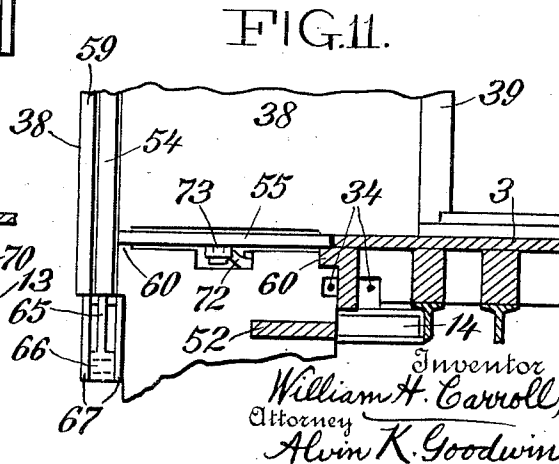
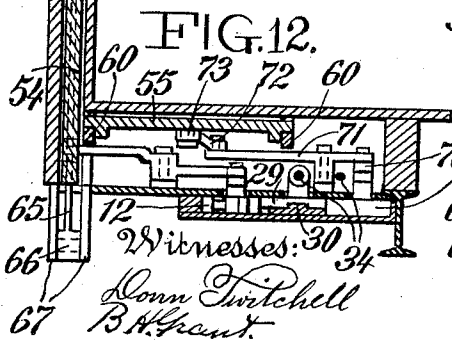
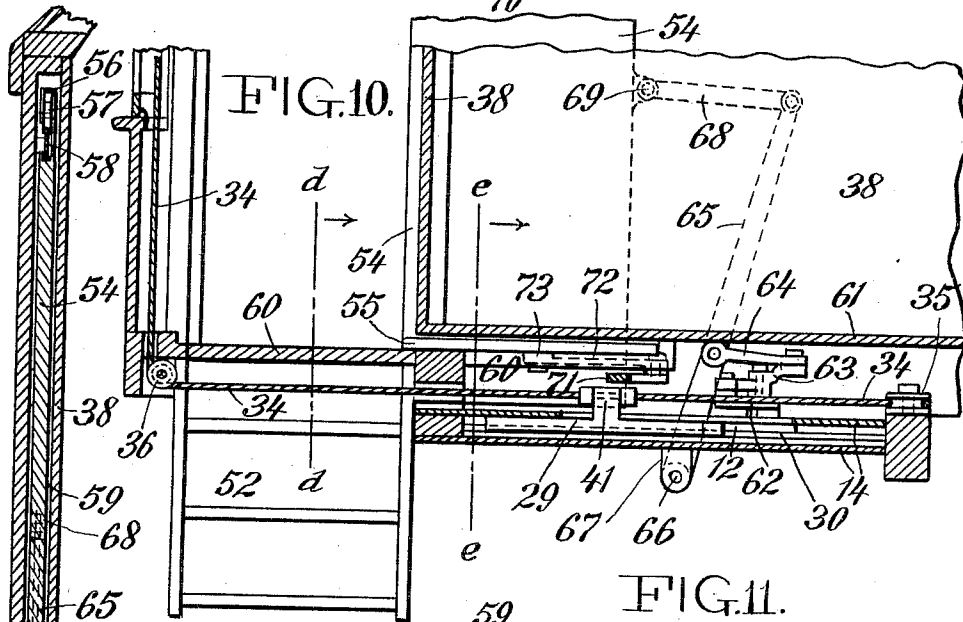
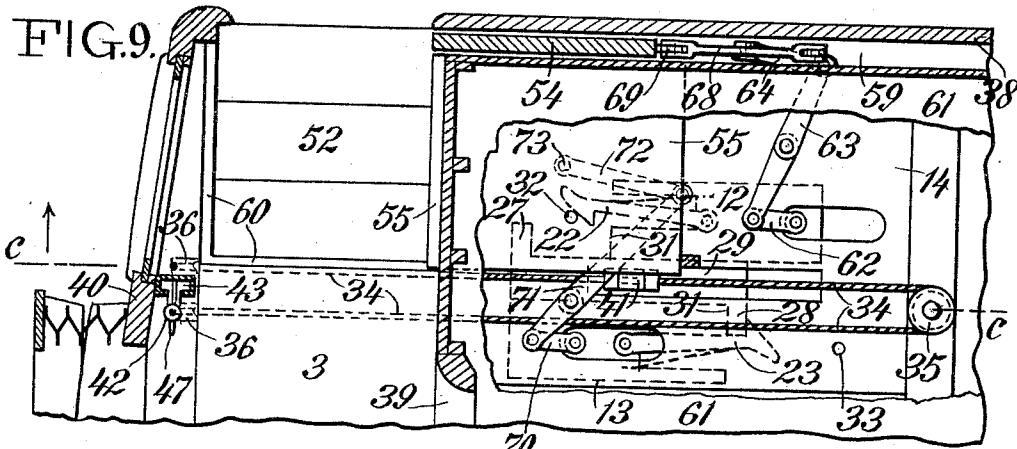
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4 SHEETS-SHEET 4.

FIG. 13.

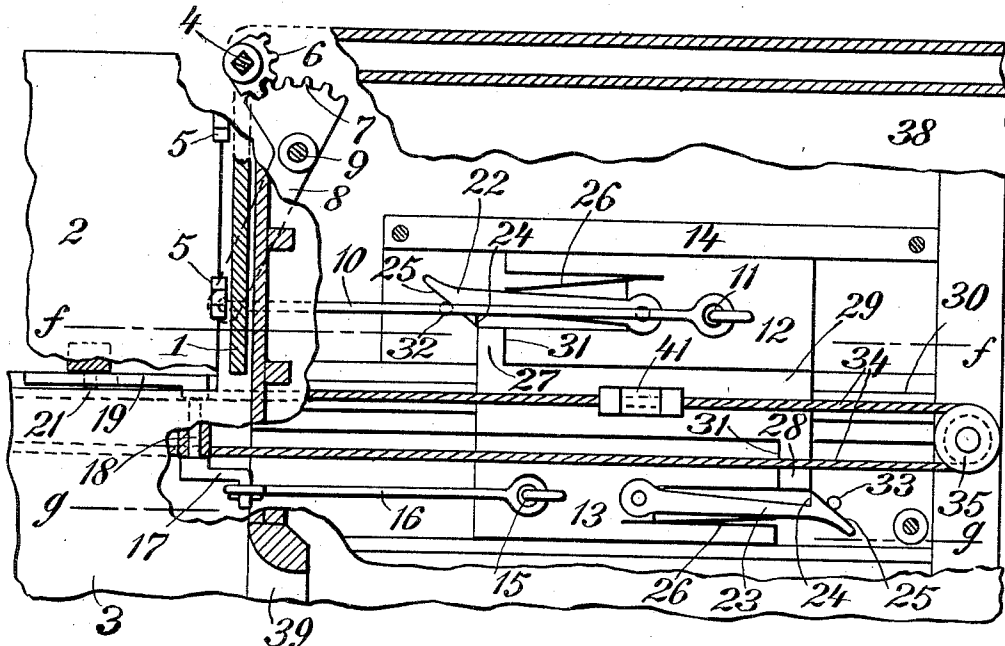


FIG. 14.

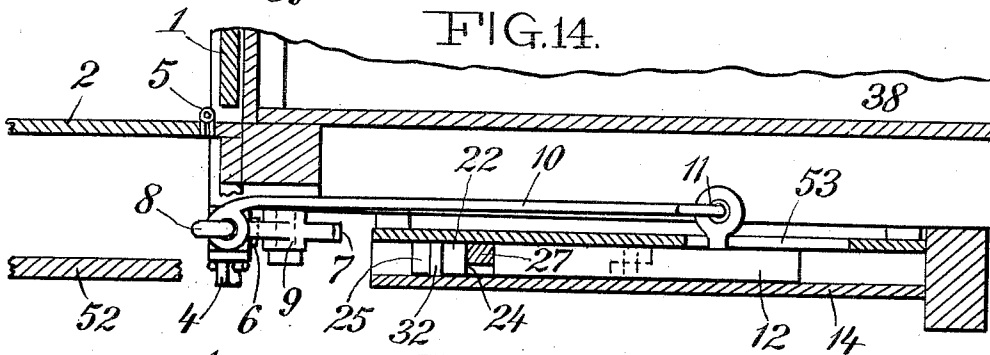
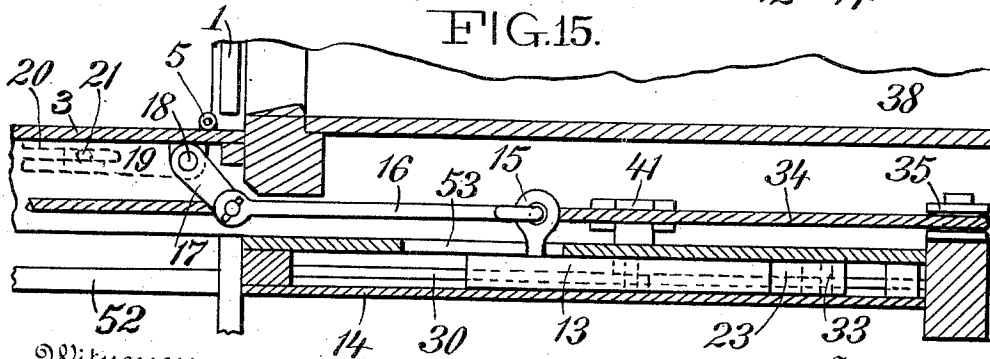


FIG. 15.



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UNITED STATES PATENT OFFICE

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RAILWAY-CAR VESTIBULE DOOR AND TRAP.

1,044,487.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed September 29, 1911. Serial No. 651,967.

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 the outer doors and car-step-covering traps of vestibules of railway passenger cars, and has for its object to provide improved apparatus of this class permitting opening and closing of both the doors and traps at one or both sides of the vestibule or assuring opening and closing of the doors while the traps remain closed, whereby passengers may enter or leave the cars at either low or high station platforms.

The invention is more especially directed toward mechanism for operating either hinged or sliding doors and traps, and comprises simple and reliable devices including a shouldered traveler and two reciprocating slides each having shoulders adapted to automatically engage and release the traveler shoulders, one of said slides being connected to the vestibule door and the other to its trap.

The invention also includes an endless cable as a means for operating the traveler and slides, with latch devices locking the cable to an upright of the car vestibule frame; and further includes a special arrangement of the trap to slide open longitudinally beneath the car body, together with a door sliding open next the side wall of the car body; all as hereinafter described and 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 one side of the end platform of a vestibuled railway car, showing a hinged door open and a hinged trap closed, and connections from said door and trap to their operating mechanism. Fig. 2 is a detail longitudinal vertical section with both the door and trap open. Fig. 3 is a detail vertical transverse section on the line *a-a*

in Fig. 2. Fig. 4 is an enlarged vertical section showing the operating cable and its handle and the latch devices which lock the door and trap open and closed. Figs. 5, 6 and 7, are broken out sectional plan views showing varying positions of the hinged car door and trap, with correspondingly changed adjustments of their operating mechanism from which the top cover plate has been removed. Fig. 8 is an enlarged detail transverse section on the line *b-b* in Fig. 7. Fig. 9 is a sectional plan view showing a sliding vestibule door and a sliding car-step-covering trap, both open, and their operating mechanism and connections. Fig. 10 is a vertical longitudinal section on the line *c-c* in Fig. 9. Fig. 11 is a detail transverse vertical section on the line *d-d* in Fig. 10. Fig. 12 is a vertical sectional view on the line *e-e* in Fig. 10, but showing the full height of the vestibule door. Fig. 13 is a partly broken out sectional plan view of parts adjusted as in Fig. 6, but drawn to an enlarged scale. Fig. 14 is a detail longitudinal vertical section on the line *f-f* in Fig. 13, and Fig. 15 is a longitudinal vertical section on the line *g-g* in Fig. 13.

Referring first more especially to Figs. 1 to 8 and 13 to 15 of the drawings, the numeral 1 indicates the hinged outer vestibule door, and 2 the hinged car-step-covering trap which when closed is level with the vestibule platform 3. The door is hinged on vertical pintles 4 so as to swing shut horizontally and then overlies the closed trap 2 to temporarily prevent upward opening of said trap on its horizontal hinges 5. The lower door pintle 4 fixedly carries a gear segment 6 with which meshes a gear segment 7 on a lever 8 fulcrumed at 9 to the car frame and coupled to a rod 10 which is connected at 11 to a slide 12 which reciprocates in a suitable dust and weather guarding casing 14 fixed to the car body and which also holds a second similar slide 13. Said slide 13 is connected at 15 to a rod 16 which is coupled to a crank 17 on a rocking shaft 18 having a rigid arm 19 slotted at 20 to engage a pin 21 fixed to the hinged trap 2. By reciprocating the rods 10, 16, the door 1 and trap 2 may be opened and closed.

The slides 12, 13 respectively have strong pivoted hooks 22, 23, the head of each of which has a transverse shoulder 24 and an inclined outer edge or face 25. Springs 26 normally force the hook heads inward into position to be engaged at their shoulders 24 with lugs 27, 28 shown projecting laterally in opposite directions from opposite ends of an operating traveler which may have any form giving necessary backward and forward movement to its shouldered lugs 27, 28, and is preferably made as a direct-reciprocating plate 29 guided upon a track 30 fixed to the bottom of the casing 14 and adapted by its lugs 27, 28 to engage and release the shoulders 24 of both slide hooks 22, 23, and said lugs 27, 28 are also adapted to engage and be released from relatively fixed end shoulders 31 of the slides 12, 13. Trip-pins 32, 33, fixed in the casing 14, at proper times force the hooks 22, 23, outward clear of the traveler lugs 27, 28, and the slide shoulders 31, to temporarily release the respective slides from further end-wise movement, all as hereinafter more fully explained.

Any suitable connections having a part or parts under control of a trainman standing on the car platform 3, may be used to operate the traveler 29 and the slides 12, 13, for opening and closing the door and trap 1, 2. For this purpose the drawings show an endless cable 34 so guided on pulleys 35, 36, 37, that its longer horizontal looped portion passes under the car body 38 and vestibule platform 3, while its shorter vertically ranging looped portion passes up alongside an upright of the vestibule frame which may be the one immediately next the common end doorway 39 of the car, but it is specially preferred to run said vertical cable loop along the vestibule upright 40 at the extreme outer end of the car platform in order to allow one trainman to conveniently operate the cables 34 of two adjoining cars for quickly opening and closing their vestibule doors and traps 1, 2, and while he stands quite out of the way of passengers leaving or entering the two cars. The cable 34 is secured to the slide 29 by any suitable coupling 41, and also has a hand-grasp 42 for the trainman. This handle 42 has an inner T-shaped portion 43, the neck of which runs in a slot 44 formed in the front wall of a hollow guide 45 fixed to the vestibule frame upright 40, while the T head runs within the body of the guide to prevent excessive side-play of the cable, and at the same time said T head forms a supporting bearing for the outer bolt-end 46 of a latch lever 47 pivoted to the handle 42. This bolt 46 may enter any one of three sockets 48, 49, 50 made in the back wall of the guide 45, for holding the cable 34, and consequently

the traveler 29 in any one of three positions for locking the vestibule door and trap open or closed. A spring 51 on the handle 42 normally locks the bolt 46 within one of the guide sockets.

The complete operation is as follows:— Let us assume that the vestibule door and trap 1, 2, are both open, as shown in Figs. 2, 3 and 5 of the drawings, and that the handle 42 on the cable 34 had been pulled fully downward and that the handle latch bolt 46 then is in the lower cable guide socket 48, as shown in Fig. 4, and locks the door and trap open by preventing movement of the cable 34. Passengers now may freely leave or enter the car via its steps 52, to or from a low station platform or the railway roadbed. The traveler and slide mechanism parts now have relative positions shown in Fig. 5 of the drawings. After the car resumes its travel, the trap 2 and door 1 are to be closed. To do this the trainman grasps the cable handle 42 and presses the latch lever 47 to withdraw its bolt 46 from the guide socket 48, and then he pulls upward on the handle 42. This moves the traveler 29 toward the right, and as the traveler lug 28 now lies between the shoulder 31 of the slide 13 and the head shoulder 24 of the impressed hook 23, the lug 28 will carry the hook and consequently the slide 13 to the right thereby pulling the rod 16 and turning the crank-shaft 17—18, and causing the lever 19, by acting on the trap pin 21, to swing the trap 2 downward on its hinges 5 to close it as shown in Fig. 1 of the drawings. During this trap-closing movement of the slide 13, the door operating slide 12 had remained at rest, there being sufficient space between the traveler lug 27 and the end shoulder 31 of the slide 12 to permit said independent trap-closing movement of the other slide 13 by the traveler 29.

During the latter part of the left-hand movement of the slide 12 by which the door 1 had last been opened, the inclined face 25 of the head of hook 22 had struck the fixed trip-pin 32 which forced the hook head outward sufficiently to allow the traveler lug 27 to later meet the end shoulder 31 of said slide 12, and during the last part of the above named partial right-hand movement of the slide 13, the inclined face 25 of the other hook 23 had struck the fixed trip-pin 33, and had thus removed the shoulder 24 of said hook 23 outward clear of the path of the traveler lug 28 to permit further right-hand movement of the traveler 29 while the slide 13 remains at rest, this being the relative adjustment of parts of the traveler and slide mechanism shown in Figs. 6 and 13, the traveler now being in its central position. A continued upward pull on the cable handle 42 by the train-

man now will move the traveler to its extreme right-hand position and during this movement the traveler lug 27, by drawing on the shoulder 31 of the slide 12, will move said slide to the extreme right with it, thereby pulling the rod 10 and operating the lever 8 and gearing 7, 6, to swing the door 1 closed, and the latch bolt 46 will be permitted to enter the uppermost socket 50 of the cable guide 45 to lock the door closed. As the door swings shut over the closed trap, the closed door will lock the trap closed. While the door is being closed by the slide 12 and its connections the trap-operating slide 13 remains at rest while its hook 23 is held outward by the trip-pin 33 to permit the traveler lug 28 to strike the end shoulder 31 of said slide 13 as the traveler is moved back to the left to its central position, and the parts now have relative positions shown in Fig. 7 of the drawings.

If the moving train next approaches a station having a platform about level with the car vestibule platform 3, the trap 2 must remain closed to permit passengers to walk over it to and from the station while the vestibule door 1 stands open, hence the door 1 now must be opened and closed while the trap remains closed. This is done by the trainman first releasing the latch-bolt 46 from the cable guide socket 50 and then pulling downward on the handle 42 to move the traveler 29 to the left from the position of Fig. 7 to that of Figs. 6 and 13. During this traveler movement its lug 27 is caught behind the shoulder 24 of the impressed hook 22, and consequently the slide 12 moves to the left with the traveler, the open space between the traveler lug 28 and the shoulder 31 of the slide 13 allowing the latter slide to remain at rest while the moving slide 12 opens the door by means of the rod 10, lever 8 and gearing 7, 6. The latch-bolt 46 now may be permitted to engage the central cable guide socket 49 to lock the door 1 open while the trap 2 remains closed. After leaving this high-platform station the vestibule door 1 may be again closed by simply unlocking the latch-bolt 46 from the socket 49 and pulling the cable 34 upward again to return the slide 12 from the central position of Figs. 6 and 13 to the right-hand position of Fig. 7, which is done by the traveler lug 27 acting on the shoulder 31 of said slide 12, and the bolt 46 will again be engaged with the guide socket 50 to lock both door 1 and trap 2, closed.

Should the train again approach a low-platform station, the trainman unlocks the cable handle 42 and pulls it downward thereby first causing the traveler 29 to be moved to the left from its position shown in Fig. 7, whereby engagement of the traveler lug 27 with the shoulder 24 of the hook 22

of slide 12, will first move said slide to the left-hand central position shown in Figs. 6 and 13, thereby causing the rod 10, lever 8, and gearing 7, 6, to open the vestibule door 1, and when this is done the trip-pin 32 had pressed the hook 22 outward to disengage it from the traveler lug 27, and as at this time the traveler lug 28 had passed the held back head of the other hook 23 and had come in contact with the shoulder 31 of the other slide 13, it is obvious that a continued down-pull on the cable handle 42 will carry the traveler from its central position of Figs. 6 and 13 to its extreme left-hand position of Fig. 5, by pull of the lug 28 on the shoulder 31 of slide 13, and as said slide moves to the left with the traveler it will push on the rod 16 and actuate the crank-shaft 17, 18, and cause the slotted shaft arm 19, by acting on the trap pin 21, to open said trap upward against the open door, and the traveler and duplex slide mechanism and connections again have the first named relative positions of their parts shown in Fig. 5 of the drawings. The top wall of the casing 14 is slotted at 53 to permit movement of the rod and cable connections 11, 15, 41, of the coacting slides 12, 13, and the traveler 29, as shown in Figs. 1 and 8 of the drawings.

Referring now more especially to Figs. 9 to 12 of the drawings, it will appear that the vestibule door 54 and the car-step-covering trap 55 are both arranged to slide longitudinally of the car body 38. Fig. 12 shows that the door is supported by hangers 56 having rollers 57 running upon an overhead track 58 fixed to permit the door to slide open within any suitable pocket or space 59 provided for it in or at the car body side wall, and Figs. 10, 11 and 12 show that the trap 55 slides upon suitable track supports 60 provided under the car body floor 61 and on the end platform frame to allow the closed slide to lie level with the vestibule platform 3. The operating mechanism for the sliding trap and door comprises a traveler 29 coupled at 41 to the endless cable 34 and having the two shouldered lugs 27, 28; and two slides 12, 13 respectively having spring-pressed shouldered hooks 22, 23, and shoulders 31, coacting with the traveler lugs and operating relatively to each other substantially as hereinabove described relatively to the operation of the hinged door and trap 1, 2, shown in Figs. 1 to 8 of the drawings. The direct connections from the slides 12, 13 to the sliding door and trap necessarily differ from those for the hinged door and trap and are briefly described as follows.

A horizontal link 62 pivoted to the slide 12 is coupled to a horizontal lever 63 which in turn is pivoted to a link 64 pivoted to a long upright lever 65 fulcrumed at 66 to fixed supports 67 on the car body and rang-

ing upward within the inner portion or extension of the door-receiving space 59 wherein said lever 65 is coupled by a link 68 to the inner edge of the sliding door 54 at 69.

5 The slide 13 carries a pivoted horizontal link 70 to which is coupled the short arm of a horizontal lever 71 fulcrumed to the car body or to the cover of the traveler and slide mechanism and coupled at its long arm

10 to a horizontal link 72 which is pivoted at 73 to about the lateral center of the trap 55. It is obvious that as the two slides 12, 13 are moved by the traveler in opposite directions by the unlocked moving cable 34, the

15 door mechanism 62 to 69 and the trap mechanism 70 and 73 will be actuated to slide the door 54 and the trap 55 to open and closed positions, either both open or both closed, or to open and close the door alone while

20 the trap remains closed, the traveler 29 and the two slides 12, 13 then coacting by their shouldered lugs 27, 28 on the traveler and the yielding and relatively fixed shoulders 24, 31 on the slides, in manner similar to

25 their operation hereinbefore described when opening and closing the hinged door and trap 1, 2, hence it is deemed unnecessary to again recite in detail the peculiar movements and operations of the coacting traveler and

30 slides during opening and closing of the sliding vestibule door and trap.

There are two sets of the traveler and slide devices with connections respectively operating the door and trap at opposite sides

35 of a car vestibule, and either set of devices may be operated independently, or both sets may be operated successively, for properly adjusting the doors and traps to accommodate exit or entrance of car passengers to or

40 from station platforms at one or both sides of a railway train.

Any approved means other than the cable 34, may be used to actuate the traveler for reciprocating the slides, and such actuating

45 means may operate mechanically, pneumatically or electrically, as convenience or necessity may suggest or require. Furthermore, the two slides may be located one in advance of the other for operation along one

50 side of a traveler having reciprocatory shoulders adapted to engage and release coacting shoulders on the two aligned slides, but it is preferable to arrange the slides one at each side of the traveler in order to shorten the

55 door and trap actuating mechanism and connections, thereby lessening cost of manufacture and promoting easy access to the casing-inclosed traveler and slides.

The traveler and duplex slide mechanism

60 herein described is not limited in use to the operation of railway car vestibule doors and traps, as said mechanism may be employed to operate any two independently movable structures connected respectively to the two

65 slides and requiring forward and return

movements successively, or requiring that only one of the two structures be given a forward and return movement while the other structure remains at rest. Some of the appended claims therefore are to be construed in this broad sense, or as being more especially directed to the traveler and slide mechanism, notwithstanding their mention of car vestibule doors and traps the operation of which is to be considered as one

70 practical application of the novel traveler and slide mechanism.

75

I claim as my invention:—

1. Car vestibule door and trap mechanism comprising a traveler, two reciprocatory

80 slides operated by said traveler, connections from one slide to the door and from the other slide to the trap, and means operating the traveler, said traveler and slides having mutually engaging and releasing shoulders

85 moving the respective slides to open and close the door and trap.

2. Car vestibule door and trap mechanism comprising a traveler, two reciprocatory

90 slides operated by said traveler, connections from one slide to the door and from the other slide to the trap, and means operating the traveler, said traveler and slides having mutually engaging and releasing shoulders moving the respective slides to open

95 and close the door and trap, and permitting the door alone to be opened and closed by one moving slide and its connections while the other slide rests and the trap remains closed.

100

3. Car vestibule door and trap mechanism comprising a traveler having two projecting lugs, two reciprocatory slides operated by

105 said traveler, each slide having a yielding shoulder and an adjacent relatively fixed shoulder adapted to engage and release one of the traveler lugs, connections from one slide to the door and from the other slide to the trap, and means operating the traveler, whereby both the door and trap may be

110 opened and closed by the respective moving slides.

4. Car vestibule door and trap mechanism comprising a traveler having two projecting lugs, two reciprocatory slides operated by

115 said traveler, each slide having a yielding shoulder and an adjacent relatively fixed shoulder adapted to engage and release one of the traveler lugs, connections from one slide to the door and from the other slide to the trap, and means operating the traveler, whereby both the door and trap may be

120 opened and closed by the respective moving slides, and permitting the door alone to be opened and closed by one moving slide and its connections while the other slide rests and the trap remains closed.

125

5. Car vestibule door and trap mechanism comprising a traveler having two projecting lugs, two reciprocatory slides each carrying

130

a pivoted hook formed with a head having an inclined face and a transverse shoulder facing an adjacent relatively fixed shoulder on the slide, connections from one slide to the door and from the other slide to the trap, means operating the traveler, trip-pins actuating the hooks at proper times to release the hook of one slide from one traveler lug and permit engagement of the other traveler lug with the fixed end shoulder of the other slide, whereby both the door and trap may be opened and closed by the respective moving slides.

6. Car vestibule door and trap mechanism comprising a traveler having two projecting lugs, two reciprocatory slides each carrying a pivoted hook formed with a head having an inclined face and a transverse shoulder facing an adjacent relatively fixed shoulder on the slide, connections from one slide to the door and from the other slide to the trap, means operating the traveler, trip-pins actuating the hooks at proper times to release the hook of one slide from one traveler lug and permit engagement of the other traveler lug with the fixed end shoulder of the other slide, whereby both the door and trap may be opened and closed by the respective moving slides, and permitting the door alone to be opened and closed by one moving slide and its connections while the other slide rests and the trap remains closed.

7. Car vestibule door and trap mechanism comprising a traveler, two reciprocatory slides operated by said traveler, connections from one slide to the door and from the other slide to the trap, said traveler and slides having mutually engaging and releasing shoulders moving the respective slides to open and close the door and trap, and means operating the traveler and slides including an endless cable coupled to the traveler and running beside an upright of the car vestibule frame in reach of a trainman.

8. Car vestibule door and trap mechanism comprising a traveler, two reciprocatory slides operated by said traveler, connections from one slide to the door and from the other slide to the trap, said traveler and slides having mutually engaging and releasing shoulders moving the respective slides to open and close the door and trap, and means operating the traveler and slides including an endless cable coupled to the traveler and running beside an outer end upright of the car vestibule frame in reach of a trainman who thus may operate the door and trap mechanism of two adjoining cars without interfering with the exit and entrance of passengers.

9. Car vestibule door and trap mechanism comprising a traveler, two reciprocatory slides operated by said traveler, connections from one slide to the door and from the other

slide to the trap, said traveler and slides having mutually engaging and releasing shoulders moving the respective slides to open and close the door and trap, and means operating the traveler and slides including an endless cable coupled to the traveler and running beside an upright of the car vestibule frame in reach of a trainman, and a latch device held to the cable and adapted to secure it at different points to said upright and thereby lock the car door and trap open or closed.

10. In car vestibule door and trap mechanism, the combination with a traveler and devices connecting said traveler to the door and trap for operating them, of an endless cable coupled to the traveler and running beside an upright of the car vestibule frame in reach of a trainman.

11. In car vestibule door and trap mechanism, the combination with a traveler and devices connecting said traveler to the door and trap for operating them, of an endless cable coupled to the traveler and running beside an outer end upright of the vestibule frame in reach of a trainman who thus may operate the door and trap opening and closing mechanisms of two adjoining cars without interfering with the exit and entrance of passengers.

12. In car vestibule door and trap mechanism, the combination with a traveler and devices connecting said traveler to the door and trap for operating them, of an endless cable coupled to the traveler and running beside an upright of the car vestibule frame, said cable carrying a latch device adapted to secure it at different points to said upright and thereby lock the car door and trap open or closed.

13. A railway car having an outer vestibule door adapted to slide open longitudinally along the car body side wall, and also having a car-step-covering trap adapted to slide open longitudinally beneath the car body, and door and trap operating mechanism comprising a traveler, two reciprocatory slides operated by said traveler, connections from one slide to the door and from the other slide to the trap; said traveler and slides having mutually engaging and releasing shoulders moving the respective slides to open and close the sliding door and trap.

14. Car vestibule door and trap mechanism comprising a reciprocating traveler having two opposite end lugs 27, 28 respectively projecting laterally in opposite directions, two slides 12, 13 movable at opposite edges of the traveler and respectively carrying pivoted hooks 22, 23 each having a shoulder 24 and an inclined face 25; springs 26 normally forcing the hook heads inward toward the traveler, said slides 12, 13 each also having an end shoulder 31 facing its

hook shoulder 24; pins 32, 33 releasing one
slide from one traveler lug and permitting
engagement of the other traveler lug with the
fixed end shoulder of the other slide, con-
5 nections from one slide to the door and from
the other slide to the trap, and means oper-
ating the traveler and thereby reciprocating

the slides for opening and closing the door
and trap.

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