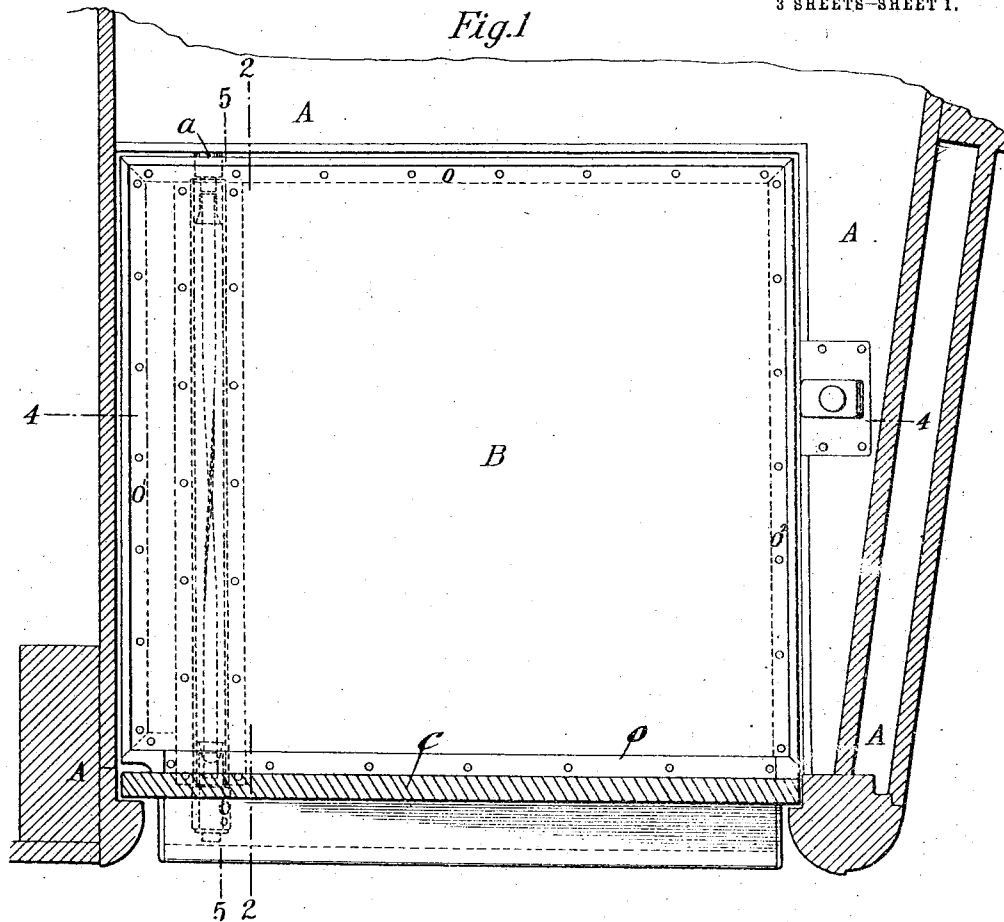
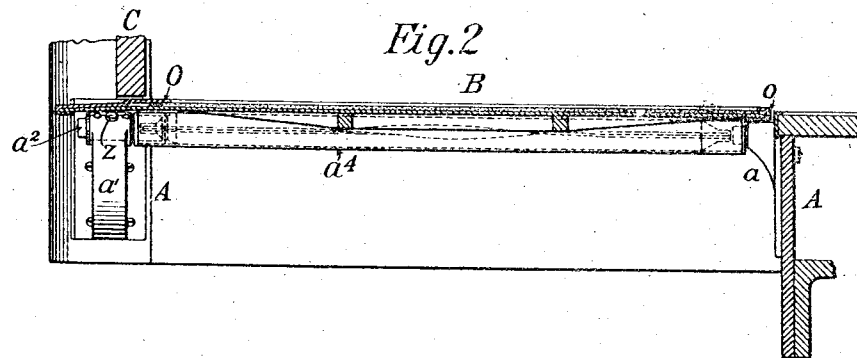


O. M. EDWARDS.
 TRAP DOOR FOR RAILWAY CARS AND SIMILAR STRUCTURES.
 APPLICATION FILED DEC. 20, 1909. RENEWED SEPT. 20, 1912.

1,119,940.

Patented Dec. 8, 1914.

3 SHEETS—SHEET 1.



Witnesses:
Raphael Heller
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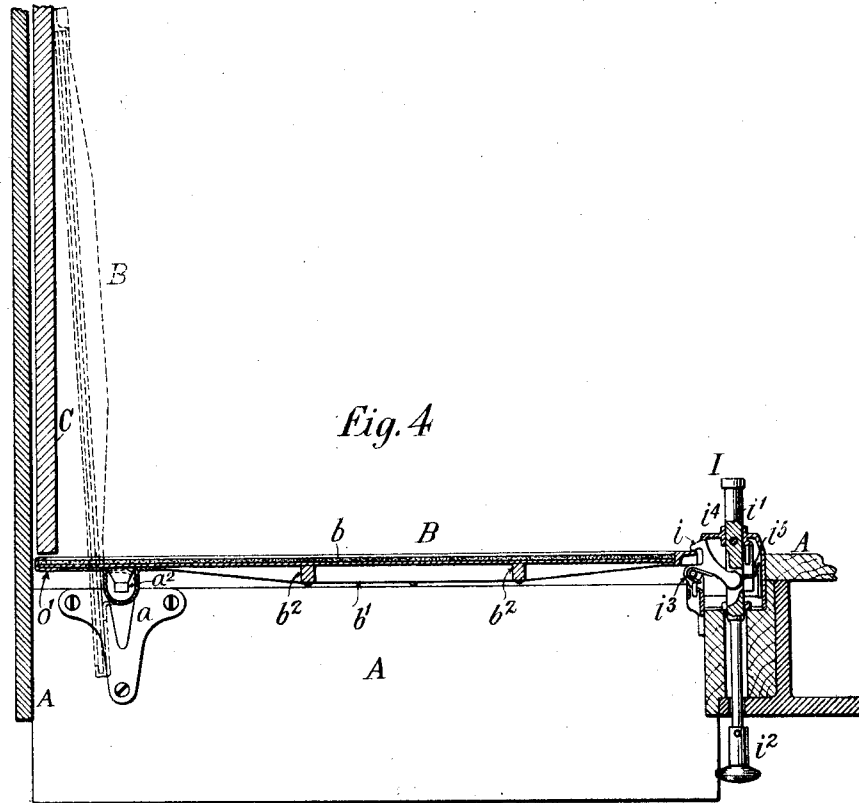


Fig. 4

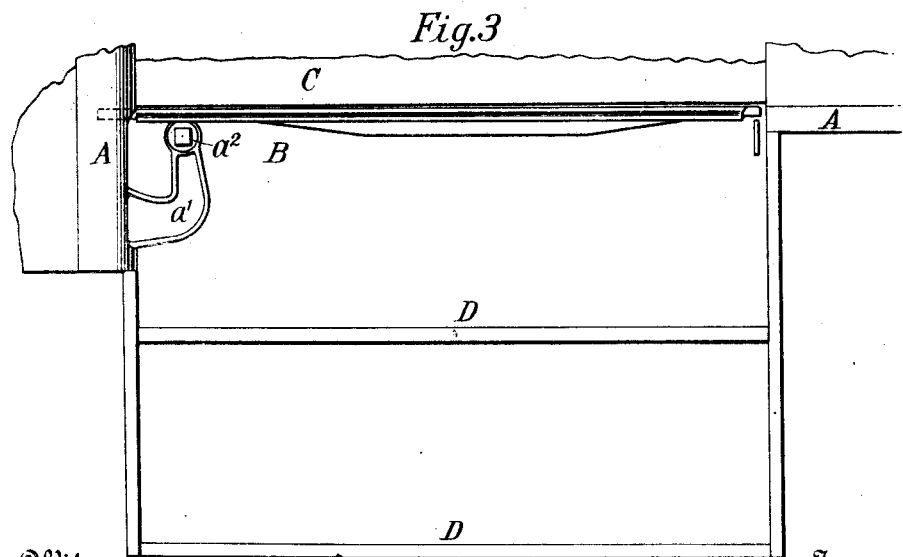


Fig. 3

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3 SHEETS—SHEET 3.

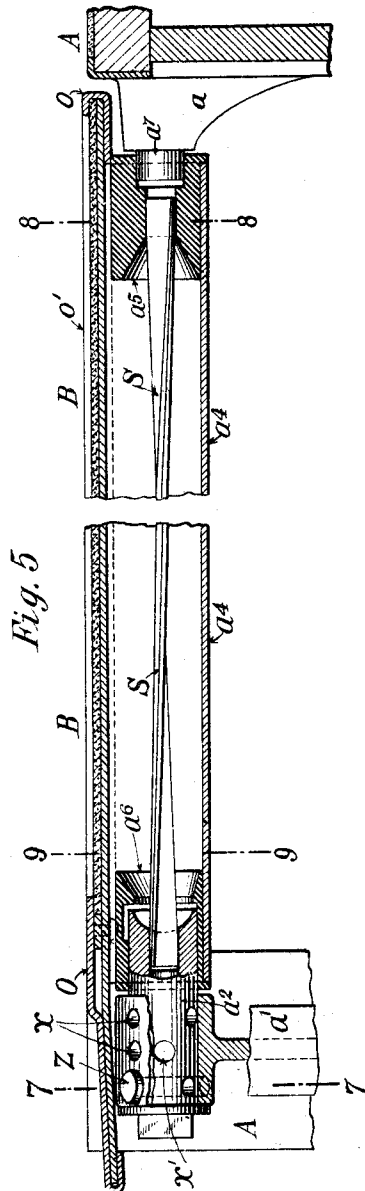
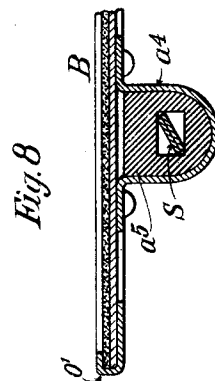
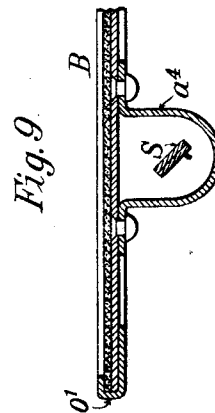
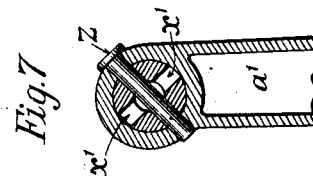
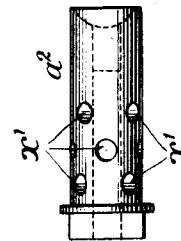


Fig. 6

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UNITED STATES PATENT OFFICE.

OLIVER M. EDWARDS, OF SYRACUSE, NEW YORK.

TRAP-DOOR FOR RAILWAY-CARS AND SIMILAR STRUCTURES

1,119,940.

Specification of Letters Patent.

Patented Dec. 8, 1914.

Application filed December 20, 1909, Serial No. 534,032. Renewed September 20, 1912. Serial No. 721,513.

To all whom it may concern:

Be it known that I, OLIVER M. EDWARDS, a citizen of the United States, residing at Syracuse, county of Onondaga, State of New York, have invented certain new and useful Improvements in Trap-Doors for Railway-Cars and Similar Structures, of which the following is a full, clear, and exact description, reference being had to drawings accompanying the same.

This invention relates generally to trap doors for cars and similar structures, such for instance as are used to cover and uncover the steps leading to and from the end platforms of passenger cars and certain features of the invention relate particularly to trap doors for use on vestibule cars adapted to be used on lines where some of the station platforms are substantially level with the car platforms and other station platforms are much lower than the car platform. At all stations the vestibule doors are opened and closed, but at the stations where the platforms are substantially level with the platforms of the cars the trap doors are not opened for the ingress and egress of passengers. When the stations are reached where the platforms are lower than the platforms of the cars the trap doors are opened to enable the passengers to readily enter and leave the cars by the steps usually provided for this purpose.

One of the objects of this invention is to provide a trap door adapted to extend under and beyond the ordinary vestibule door and so combined with the platform as to permit of the vestibule doors opening and closing without opening the trap door.

Another object is to provide a trap door that can be readily opened after the vestibule door is opened and which when closed will cover the space naturally occupied by the vestibule door when fully opened.

Another object is to so combine the door and the hinges by which it is mounted in the platform that the springs which more or less counterbalance the weight of the door can be quickly and readily removed from their operative position and returned thereto without displacing the fixed portions of the hinging means by which the door is mounted in the platform.

Another object is to provide means for a fine adjustment of the tension of the spring

or springs used to more or less counterbalance the weight of the door.

Other objects will appear from the descriptions hereinafter given.

The invention consists in the combinations of parts or devices herein set forth and particularly pointed out in the claims hereunto annexed and which form a portion of this specification.

Figure 1 is a horizontal sectional view through a portion of the vestibule of a car above the platform showing in plan view a portion of the platform with one embodiment of my improved trap door mounted therein. Fig. 2 shows in vertical section on line 2—2 of Fig. 1 that which is there seen when looking from the right toward the left, a portion of the vestibule door being seen in section. Fig. 3 illustrates in side elevation a portion of a car, the steps and the trap door, as it is seen when closed over the steps, with a portion of the car vestibule door in closed position over the trap door. Fig. 4 shows in vertical section on line 4—4 of Fig. 1 that which is there seen with the car vestibule door in the open position and in section, the trap door being there shown in dotted lines in the open position and in full lines in the closed and locked position. Fig. 5 shows in vertical section an enlarged scale that which is seen on line 5—5 of Fig. 1, portions of the door being broken away to better illustrate the hinging of the door in the platform and the combination of the adjusting means and springs therewith. Fig. 6 illustrates in elevation the removable portion of the hinge and the adjusting means seen at the left of Fig. 5. Fig. 7 illustrates in vertical section on line 7—7 of Fig. 5 one of the hinge brackets and portions of the adjusting means seen in position to hold the springs under tension. Fig. 8 illustrates in cross section on line 8—8 of Fig. 5 that portion of the member received by the opposite hinge bracket and the manner of connecting the springs therewith so that the tension thereof may act upon the door. Fig. 9 illustrates in cross section on line 9—9 of Fig. 5 that which is there seen including the manner of connecting the hinge to the door.

Like letters of reference, wherever they occur indicate corresponding parts of the several figures of the drawings.

A represents a portion of the end platform of a car in which the trap door B is hung so that it may be moved or swung from the position seen in Figs. 1 and 2 to that seen in dotted lines in Fig. 4. The end platform shown includes the usual vertical side posts.

C represents the vestibule door which is mounted to swing on a vertical axis and over the trap door, when the same is closed, when the door C is opened or closed.

D D represent the steps of the car which are to be covered and uncovered by the trap door.

The trap door B is preferably constructed of metal in the manner shown, but it may be of any desired construction adapted to serve the purpose herein set forth. The trap door, as shown, is composed of a flat sheet of metal *b* of substantially the dimensions of the door and a second sheet of metal *b'* which after being suitably bent into shape, is secured at its edges to the edges of the plate *b* by any suitable means, the plates being separated from one another at their central portions by any suitable means as *b²*, so that the door is reinforced on the truss principle. This construction is no necessary part of the present invention and is described and claimed in Letters Patent No. 942,711, dated December 7, 1909. The trap door is further strengthened or reinforced by binding strips *o*, *o'*, *o²*, at three of its edges and by a threshold piece *O* at the fourth edge portion which is the one adjacent to the exterior side portion of the car. This door is preferably hinged to the car in the manner illustrated so as to move toward the end of the car in opening, but it may be otherwise hinged in the platform if desired. As shown two brackets *a* and *a'* are secured to the car or platform one of which, *a* is attached to the platform near the inner edge of the door opening in the platform and the other, *a'* is attached to the platform near the outer portion of said door opening, the trap door extending beyond this outer bracket as is clearly seen in Fig. 5. The bracket *a'* carries a removable journal *a²* which is adapted to be rotated in the bracket for adjusting the trap door spring and is provided with a projecting part extending laterally from the bracket and entering a bearing member secured to the lower side of the door. This removable part or journal *a²* is of sufficient dimensions to be readily removed in an endwise direction from the bracket in which it is held by the adjusting means so that the torsional spring or springs *S*, best seen in Fig. 5, can be put into place and removed therefrom through the opening in the bracket which receives the part *a²*, as is clearly seen in Figs. 5 and 6 of the drawings. The bracket *a'* is preferably provided

with a series of three openings or holes *x*, preferably arranged in line as seen in Fig. 5 and the removable journal *a²* is provided with three series of openings or holes *x'* which pass crosswise through the same which in arrangement correspond with the holes or openings *x* in the bracket, each series of holes *x'* being arranged in line with one of the holes *x* in the bracket. These series of openings *x'* in the removable part *a²* are not arranged in line with one another but each series is placed at a different angular position in the circumference of the removable part from each of the others, there preferably being two openings clear through such removable part in each series as is more particularly shown in Fig. 7, so that only one opening in one series registers with one of the three openings in the bracket *a'* at a time. An adjusting pin *Z* is received in one of the three holes in the bracket and in one of the three series of holes in the part *a²* to secure the two together. Each series as thus formed provides for four different positions of the removable part *a²* in the bracket *a'*, and as each of the three series shown are arranged at different angular positions in the circumference of such removable part an exceedingly fine adjustment of the tension of the spring or spring *S* is provided by this form of adjusting means. This removable part *a²* of the hinge is provided at its outer end with a portion adapted to receive a wrench by which it can be turned in the bracket to give the spring or springs the desired tension to more or less counterbalance the weight of the door and at the opposite end of such part a suitable recess is made to slidably receive the end or ends of the spring or springs *S*, as seen in Fig. 5, so that as the part *a²* is rotated, the spring or springs are put under tension, the opposite end or ends thereof being received in a recess in that part of the hinge or bearing member fixedly attached to the opposite part of the trap door in the manner seen in Figs. 5 and 8. As shown flat torsional springs are preferably used but any form of spring may be used that is desired which is adapted to serve the purpose served by the form shown. As shown the hinge or bearing member is made to extend nearly across the door and the spring or springs are received therein so that they are enclosed and not in a position to be interfered with in the ordinary use of the car and trap door.

The hinge or bearing member *a⁴* attached to the door is preferably formed as shown, that is, of a portion of sheet metal bent into proper form and extending substantially across the greater part of what might be termed the length of the door and in which are secured the parts *a⁵*, *a⁶*, the part *a⁵* re-

ceiving the pintle or journal a' of bracket a and one end of the spring or springs S as seen in Fig. 5 and the other part a'' receiving the end of journal a'' projecting laterally from the bracket a' . The part a'' of the bearing member is provided with a recess having a flaring mouth to readily receive that end of the spring or springs which is to engage therewith, as seen in Fig. 5, and the journal a'' is of such dimensions that the opening in the bracket which receives such part readily receives the spring or springs S as they are passed endwise through the bracket when being placed in proper position relatively to the hinge members of the door. This removable part a'' is preferably provided at its inner end with a cup-shaped recess for receiving the end of the spring, or springs, which is held in an axial recess in the part a' opening into said cup-shaped recess.

The hinge is preferably located some distance away from that edge of the door which is adjacent to the body of the car so that as the trap door is opened that portion of it which extends beyond the hinge toward the body portion of the car moves downwardly and opens the space adjacent to the body of the car for the ready removal or escape of any dirt or other material which may have gathered there and which might interfere with the proper opening of the vestibule and trap doors. This arrangement of the hinge members relatively to the trap door not only provides for the ready escape of dirt, but also permits of the upper surface of the door being continued and extended slightly underneath the upright portion of the body of the car and makes a fine finish when the door is closed and the space next the body of the car is exposed to view. In addition that portion of the weight of the door between the hinge members and the body of the car counterbalances a corresponding weight on the opposite side of the hinge and in this way relieves the spring or springs S of a portion of the work they otherwise would do in assisting in opening and closing the trap door. The described position of the hinge brings the longitudinal axis thereof a distance away from, or in advance of, the adjacent edge of the contiguous corner post, as clearly appears in Fig. 1 so that the withdrawal of the journal a'' from the bracket a' is not interfered with by any part of the car frame.

In the embodiment of the invention herein disclosed the ordinary vestibule door moves over the trap door in opening and closing and is necessarily opened before the trap door can be opened. As such vestibule door in opening swings past the axial line of the hinge of the trap door into the position seen in Fig. 4, the trap door is readily opened into the position seen in dotted lines

to allow passengers ready egress from and ingress to the car. If the station be one where the platform thereof is substantially on a level with that of the platform of the car the trap door is not to be opened and is used in the closed position for the egress and ingress of passengers. In such cases the vestibule door only will be opened. If the station be one where the platform is of the ordinary level with station platforms generally in use at the present time the steps of the car have to be used by passengers when the trap door, after the opening of the vestibule door, is opened to give ready access to such steps.

The trap door is preferably made to extend substantially to the outer edge of the car so that when used at stations having platforms substantially level with the platforms of the cars there will be no substantial opening between the trap door and platform of the station to interfere with the ready egress from and ingress to the car. When the vestibule door swings over the trap door and platform of the car, it is desirable that that portion of the trap door extending under and beyond the vestibule door should be suitably formed to admit of the ready escape of water or other material dropping thereon and also be suitably formed to prevent passengers and others from slipping thereon in the use of the door.

As shown (see Fig. 5), the outer or exposed portion O of the trap door is formed somewhat as the threshold of an ordinary outside door of a building is formed and is preferably made by an additional piece of material formed as shown to strengthen that part of the door and it is to be provided with any suitable means such as corrugations, &c., for preventing persons from slipping thereon and also to provide for the ready escape of water or dirt falling or dripping thereon during storms or at other times. The upper surface of this trap door may be covered with any suitable material such as is used in the covering of the vestibule platform of the car and such material may be made to extend throughout substantially the entire surface of the door or otherwise as desired, the proper formation being given to the outwardly extending portion to provide for the ready escape of water and other materials falling thereon.

As shown, the threshold O is provided with an offset, Fig. 2, and the portion of the threshold extending outwardly from the offset is arranged in a plane different from the plane of the major portion of the tread surface of the door, and, as herein illustrated, said portion of the threshold is arranged at an angle to the major portion of the door and the platform.

The trap door may be provided with any

suitable means for holding it in the closed position against accidental or unauthorized opening of the same. As shown a form of holding or locking means I is here employed having a bolt or dog *i* pivotally mounted on the platform and adapted to engage with the door as it is moved into the closed position and hold it in such position until such dog is forcibly removed out of holding or locking position. This is accomplished by means of a plunger *j'* which is connected with a portion of such dog and as such plunger is moved downwardly, by pressure thereon in that direction, the dog *i* is moved against the tension of the spring *j''* out of holding or locking position and the door is free to be opened. If the tension of the spring or springs *S* be such as to partially open the door then such door immediately opens when released from the holding action of the dog *i*. The plunger *j'* is provided underneath the platform with a handle *j''* by which force may be applied thereto in a downward direction to unlock the dog *i* and operate the door when desired. As shown a spring *j''* is provided to overcome the weight of the plunger *j'* and if desired aid the spring *j''* in moving the dog *i* into locking position. It will be manifest that the tension of the spring *j''* may be such if desired as to move and hold the bolt *i* and plunger *j'* in the positions shown in the drawings. The means thus described for holding the trap door in the closed position forms no necessary part of the present invention, the means thus shown being a convenient form for so holding the door but any other form of means desired may be employed for this purpose.

What I have herein shown and described will naturally suggest to others skilled in this art other embodiments of this invention and also modifications in the construction and arrangement of the parts wherein substantially the same results may be accomplished by combinations of elements or devices having essentially the same mode of operation as the combinations that are particularly pointed out in the claims hereunto annexed, hence I do not wish to limit my invention to the specific form and arrangement herein shown and described, but desire to include all forms and arrangements which embody the spirit of my invention and which have substantially the same mode of operation as do the specific parts and arrangements herein set forth.

What I desire to claim as new is:--

1. The combination, in a vestibule passenger car, of a vestibule door mounted to swing on a vertical axis, and a platform trap-door movable about a horizontal axis, and having a part projecting beyond the

outer face of the vestibule door when both doors are closed.

2. The combination, in a vestibule passenger car, of a vestibule door mounted to swing on a vertical axis, and a platform trap-door movable about a horizontal axis, and having a part projecting beyond the outer face of the vestibule door when both doors are closed, said projecting part having its face disposed in a plane different from that in which the face of the major portion of the trap door is located.

3. The combination in a vestibule passenger car, including side posts, of a trap door hinged to turn on an axis extending transversely of the car, said axis being located at one side, or in advance of the adjacent post, and said hinge including a supporting member on the car, a bearing member on the trap-door, a journal member held in the car supporting member and projecting laterally therefrom and engaging the door bearing member, and a torsional spring engaged at one end with the door-bearing member and having an engagement at its other end with the journal, said journal being shiftable outwardly in an axial direction for disengaging the spring and door-bearing member.

4. In a passenger car, a frame, a trap-door, and means for pivotally connecting the door to the frame, and for placing the door under spring tension, comprising a bracket mounted on the frame, a bearing mounted on the door and located at one side of the bracket, a journal removably mounted in the bracket and having a portion extending laterally therefrom and engaging the door-bearing member and a spring connected at one end to the door and detachably connected at its other end to said journal.

5. In a passenger car and in combination, a trap door, and means for pivotally connecting the door to the car and for placing the door under spring tension, comprising a bearing member carried by the door, a journal fixed to the frame of the car and engaging the inner end of the bearing member, a journal adjustably mounted in the frame and engaging the opposite end of the bearing member, and a torsional spring detachably held at one end by the last named journal and connected at its other end to the door, the journal last named being removable by a movement in an axial direction from engagement with the door bearing member and the spring.

6. In a passenger car and in combination, a trap door, and means for hinging the door in the frame of the car including a bearing member carried by the door, a support carried by the frame, a spring for lifting the door and a journal carried by the support and having one end projecting within the

door member and slidably engaging an end of the spring, said journal being movable in an endwise direction for disengaging the spring and door member whereby the adjacent end of the door may be shifted laterally.

7. In a vestibule platform the combination, substantially as set forth, of a trap door adapted to extend to a point substantially coincident with the exterior side portions of the car, hinges attached to the under side of the door between the edges thereof which are substantially parallel with the axial line of such hinges and to the platform thereby movably connecting the door thereto, and a vestibule door mounted on the car and adapted to swing over the trap door in opening and closing such vestibule door.

8. In a vestibule platform the combination, substantially as set forth, of a trap door adapted to extend under and beyond the vestibule door, hinges attached to the under side of the door away from the rear edge thereof adapted to movably connect the door to the platform, and a vestibule door movably mounted on the car and adapted to open and close when the trap door is in the closed position.

9. In a vestibule platform the combination, substantially as set forth, of a trap door provided with a threshold portion having an offset formed thereon adapted to oppose the entrance of water or other material from the exterior of the car to the main portion of the platform, which threshold portion extends under and beyond the vestibule door, hinges arranged underneath the door adapted to movably connect the trap door to the platform, and a vestibule door movably mounted on the car and adapted to swing over such threshold portion of the trap door in opening and closing.

10. In a vestibule platform the combination, substantially as set forth, of a trap door provided with a threshold portion having an offset formed thereon, the outwardly extending part of such portion being arranged at an obtuse angle to the door and platform, which threshold portion extends under and beyond the vestibule door, hinges adapted to movably connect the trap door to the platform, and a vestibule door movably mounted on the car and adapted to swing over such threshold portion in opening and closing.

11. In a vestibule platform the combination, substantially as set forth, of a trap door provided with a threshold portion formed separately from the main portion of the door and which is provided with means adapted to oppose the entrance of water or other material from the exterior of the car and is attached to the trap door so

as to extend beyond the vestibule door, hinges arranged underneath and away from the rear edge of the door adapted to movably connect the trap door to the platform, and a vestibule door movably mounted on the car and adapted to move over the threshold in opening and closing.

12. In a vestibule platform the combination, substantially as set forth, of a trap door provided with a threshold portion formed separately from the main portion of the door and which is provided with means adapted to oppose the entrance of water and other material from the exterior of the car and is attached to the trap door so as to stiffen and strengthen that portion of the door to which it is attached, hinges adapted to movably connect the trap door to the platform, and a vestibule door movably mounted on the car and adapted to move over the threshold in opening and closing.

13. In a vestibule platform the combination, substantially as set forth, of a trap door adapted to extend to a point substantially coincident with the exterior side portion of the car, hinging means attached to the trap door between the side edges and wholly at one side of said door to movably connect the door with the platform and uncover a portion of the opening in the platform on each side of the axial line on which the door swings in opening, and a vestibule door movably mounted on the car and adapted to swing over the trap door when closed, in opening and closing.

14. In a platform the combination, substantially as set forth, of a trap door, hinging means attached to one side of the trap door and to the platform to movably connect the door thereto the axial line of which hinging means is some distance below such door, when in the closed position, a spring or springs connected with the hinging means for more or less counterbalancing the weight of the door, and means coacting with such hinging means adapted to adjust the tension of the spring or springs.

15. In a platform the combination, substantially as set forth, of a trap door, hinging means attached to one side of the door and to the platform for movably connecting the door thereto, a spring or springs arranged in substantially the axial line of the hinging means and removable from the other portions without disturbing the fastenings of such means for placing the spring or springs in operative position relatively to the hinging means and removing them therefrom.

16. In a platform the combination, substantially as set forth, of a trap door, hinging means attached to the door and platform for movably connecting the door thereto, which means is provided with a part

which is rotatable in the axial line of such means and is adapted to be held in different fixed relations to the portion of such means in which it rotates and is removable therefrom in an endwise direction without disturbing the mounting of such means on the door and platform, and means adapted to hold such rotatable part in operative relation to and release it from the other portions of the hinging means

17. In a platform the combination, substantially as set forth, of a trap door, hinging means attached to the door and platform in such relation thereto that a rotatable part and springs are free to pass into the hinging means along the axial line thereof, a rotatable part arranged in the axial line of such means and adapted to be held in and removed from the other portions thereof and receive one end of a spring or springs, a spring or springs adapted to be received by and be engaged with a portion of the hinging means and such rotatable part, and means adapted to engage with such rotatable part and that portion of the hinging means in which the rotatable part is mounted and hold the spring or springs in operative relation with the hinging means and trap door.

18. In a platform the combination, substantially as set forth, of a trap door, hinging means attached to the door and platform in such relation thereto as not to interfere with the movement of springs in line with the axis of such means for movably connecting the door thereto, which means is provided with a rotatable part mounted on the platform and removable from its mounting in an endwise direction and adapted to receive and hold one end of a spring or springs, a spring or springs adapted to engage with the rotatable part and the trap door, and means engageable with the rotatable part and its mounting adapted to hold such rotatable part in operative relations to and release it from its mounting.

19. In a platform the combination, substantially as set forth, of a trap door, hinging means composed in part of an endwise removable rotatable part and its mounting for movably connecting the door to the platform, a spring or springs adapted to pass by the platform through the mounting of the rotatable part, when such part is removed therefrom, and connect with such hinging means and the rotatable part, when such part is in place in its mounting, and means adapted to engage with such rotatable part and its mounting in a direction transverse thereto to hold the spring or springs under operative tension to more or less counterbalance the trap door.

20. In a platform the combination, substantially as set forth, of a trap door, hinging

means composed in part of a rotatable portion and a mounting therefor, which portion is provided with a plurality of series of engaging surfaces, each series arranged circumferentially of and at different axial points lengthwise of such portion, and which mounting is provided with a plurality of engaging surfaces, one surface for each circumferential series of surfaces on the rotatable portion, the surfaces in each circumferential series being adapted to register with the corresponding engaging surface in the mounting as such portion is rotated therein, and a stop device adapted to engage with one of the surfaces in the mounting and one of the surfaces of the registerable series of the rotatable portion and fixedly hold such portion in operative relation in its mounting.

21. In a platform the combination, substantially as set forth, of a trap door, hinging means composed in part of a rotatable portion and a mounting therefor, which portion is provided with a plurality of axial openings, each series arranged circumferentially of and at different axial points lengthwise of such portion, and which mounting is provided with a plurality of openings each of which openings is adapted to register with a series of axial openings on the rotatable portion, and a stop or pin adapted to enter one of the openings in the mounting and one of the openings in the corresponding series of the rotatable portion and fixedly hold such portion in operative relation in its mounting.

22. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform which means is provided with a rotatable part and a casing therefor adapted to receive such part from the exterior of the car in an endwise direction without disturbing the attachment of the hinging means to the platform or door and hold it in operative position therein and through which a spring may pass to engage with the trap door, a spring adapted to pass through the casing for the rotatable part in an endwise direction and engage with the rotatable part when in operative position, and means adapted to hold the rotatable part in operative position in its casing.

23. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform, which means is provided with a rotatable part, a casing therefor and adjusting means adapted to hold such rotatable part in different positions relatively to the casing in which it is mounted, means connected with the hinging means adapted to receive and guide a spring into an engagement therewith, said rotatable part

adapted to receive and guide a spring into engagement therewith in adjusting such part in operative position in its casing, and a spring adapted to engage with a portion of the hinging means and the rotatable part and more or less counterbalance the trap door.

24. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform, which means is provided with a rotatable part and a casing therefor, means connecting with the hinging means adapted to receive a spring engageable therewith, adjusting means consisting of a stop pin, a plurality of openings in the casing for the rotatable part and a plurality of series of axially arranged holes formed in the rotatable part each of which series is arranged at different angular points relatively to the axis on which such rotatable part rotates and also lengthwise thereof, the lengthwise arrangement being coincident with the openings in the casing, and a spring adapted to engage with a portion of the hinging means and the rotatable part and more or less counterbalance the trap door.

25. In a platform the combination, substantially as set forth, of a trap door, hinging means composed in part of an endwise removable rotatable part and its mounting for movably connecting the door to the platform, a spring or springs adapted to pass through the mounting of the rotatable part, when such part is removed therefrom, and connect with such hinging means and the rotatable part, when such part is replaced in its mounting, a plurality of openings formed in the mounting of the rotatable part and a plurality of series of openings in the rotatable part adapted to receive a stop or pin, each of the plurality of the openings in the mounting being adapted to register with a series of openings in the rotatable part, and a pin or stop adapted to enter any one of the openings of the mounting and an opening of its corresponding series in the rotatable part to hold the spring or springs under operative tension to more or less counterbalance the trap door.

26. In a platform the combination, substantially as set forth, of a trap door, hinging means for mounting the door in the platform composed in part of an endwise removable rotatable part, its mounting, and adjusting means for holding such part in the desired position in its mounting, which rotatable part is adapted to receive and engage with one end of a spring or springs the opposite end or ends of which are received and engaged by the opposite portion of the hinging means, and a spring or springs adapted to be placed in operative position

without disturbing those portions of the hinging means directly attached to the platform.

27. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform, which means is provided with a rotatable part, a casing therefor and adjusting means adapted to hold such rotatable part in different positions relatively to the casing in which it is mounted, cup shaped means connected with the hinging means adapted to receive and guide a spring into engagement with the hinging means, the rotatable part being provided with a cup shaped recess in one end thereof to receive and guide a spring into engagement therewith in adjusting such part in operative position in its casing, and a spring adapted to engage with a portion of the hinging means and the rotatable part and more or less counterbalance the trap door.

28. In a platform the combination, substantially as set forth, of a trap door, hinging means arranged below and away from the underside and rear edge of the trap door adapted to movably connect the door to the platform, which means is provided with a rotatable part and a casing therefor adapted to receive and hold such part and through which a spring may pass to engage with the hinging means, a spring adapted to pass through the casing in which the rotatable part is mounted and engage with a portion of the hinging means and such rotatable part, and means adapted to hold such rotatable part in operative position in its casing.

29. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform which means is provided with a rotatable part and a casing arranged relatively thereto for receiving such rotatable part from the exterior of the car in an endwise direction without disturbing the attachment of such means thereto and hold it in operative position therein and through which a spring may pass to engage with the hinging means, a spring adapted to pass through the casing for the rotatable part in an endwise direction from the exterior of the car and engage with a portion of the hinging means and the rotatable part, and means adapted to hold the rotatable part in operative position in its casing.

30. In a platform the combination, substantially as set forth, of a trap door, hinging means adapted to movably connect the door to the platform which means is provided with a rotatable part and a casing arranged relatively thereto for receiving such part, adjusting means adapted to hold

such rotatable part in different positions relatively to the casing in which it is mounted, means connected with the hinging means adapted to receive and guide a spring into
5 engagement with such hinging means and the rotatable part in adjusting such part in operative position in the casing, and a spring adapted to engage with a portion of the hinging means and its rotatable part and more or less counterbalance the trap door.

OLIVER M. EDWARDS.

Witnesses:

GEORGE G. NORRIS,
GEORGE W. COOPER.