

O. M. EDWARDS.

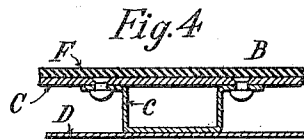
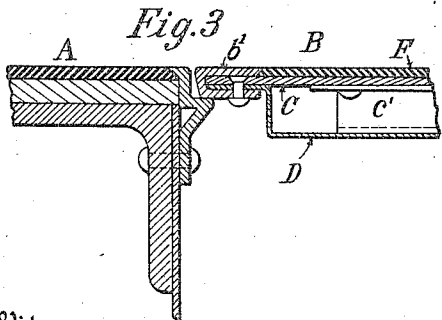
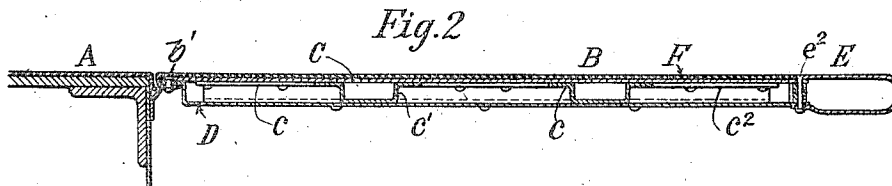
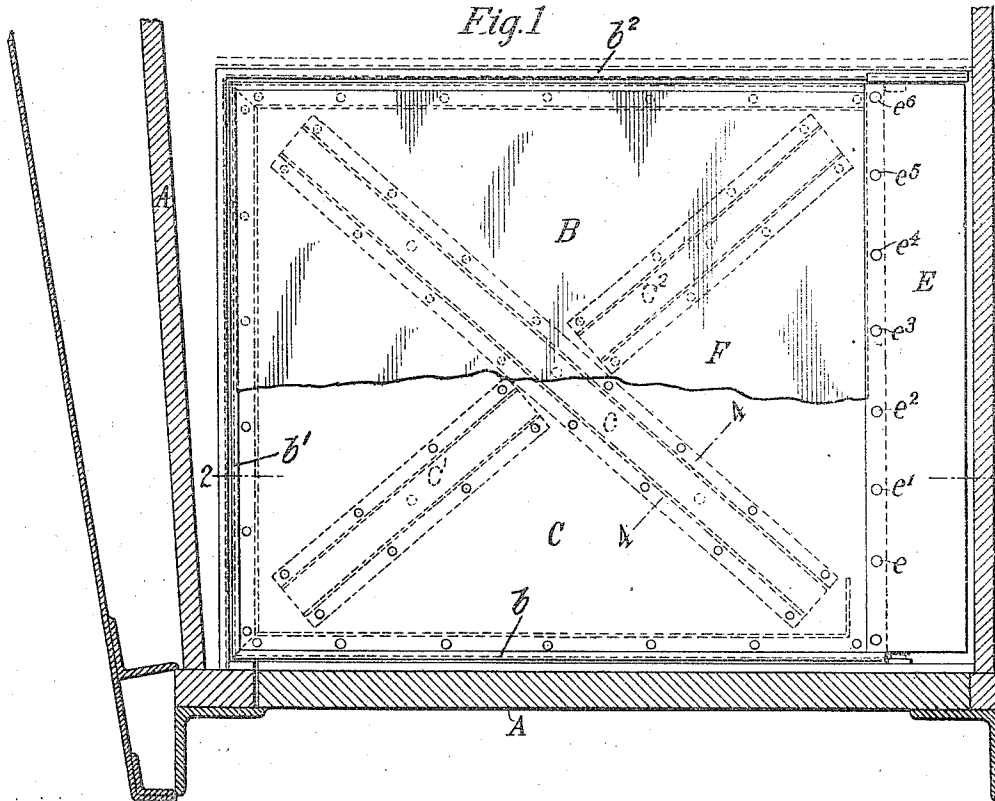
TRAP DOOR FOR RAILWAY CARS AND SIMILAR STRUCTURES.

APPLICATION FILED JUNE 17, 1909. RENEWED SEPT. 16, 1912.

1,051,395.

Patented Jan. 28, 1913.

2 SHEETS-SHEET 1.



Witnesses:
Raphael Ketter
C. D. Morrill

Oliver M. Edwards, Inventor
By his Attorney
H. J. Shawbury

O. M. EDWARDS.

TRAP DOOR FOR RAILWAY CARS AND SIMILAR STRUCTURES.

APPLICATION FILED JUNE 17, 1909. RENEWED SEPT. 16, 1912.

1,051,395.

Patented Jan. 28, 1913.

2 SHEETS—SHEET 2.

Fig. 5

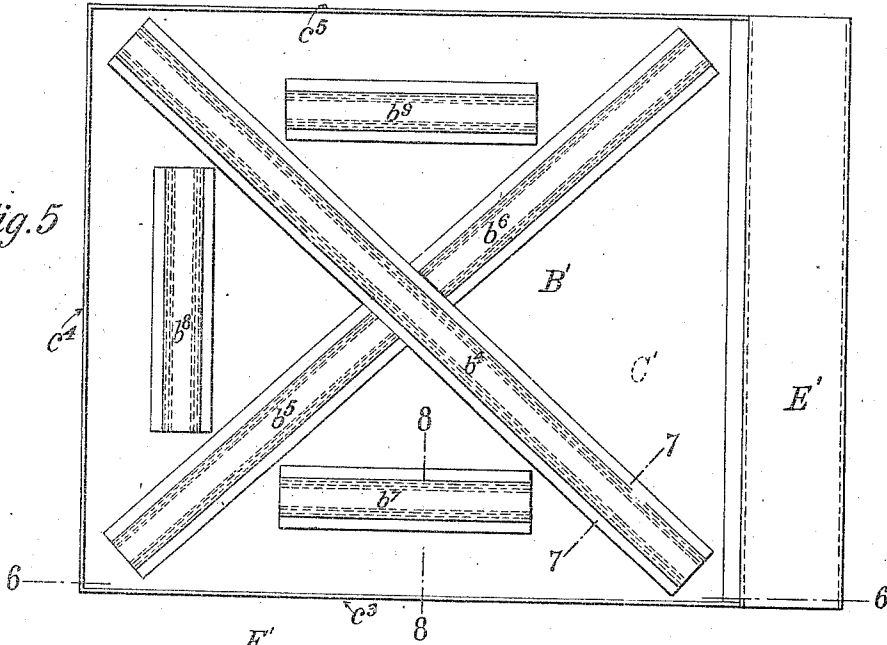


Fig. 6

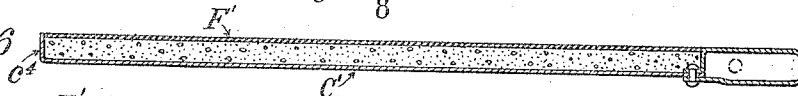


Fig. 7

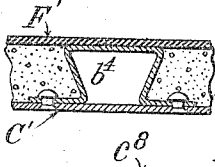


Fig. 8

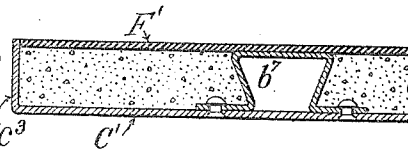


Fig. 9

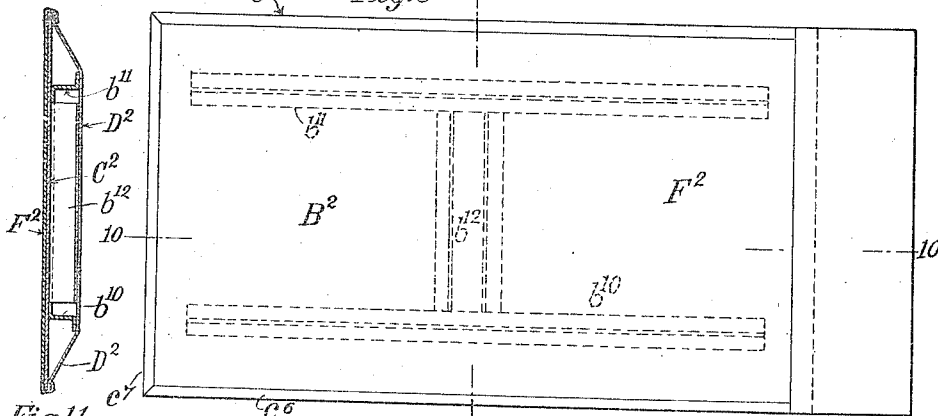


Fig. 11

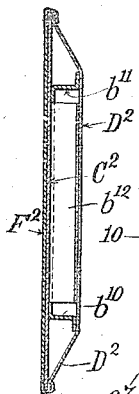
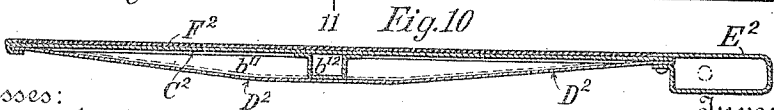


Fig. 10



Witnesses:
Raphaël Hetter
C.D. Merrill

Inventor
Oliver M. Edwards
By his Attorney
H. F. Kwohany

UNITED STATES PATENT OFFICE.

OLIVER M. EDWARDS, OF SYRACUSE, NEW YORK.

TRAP-DOOR FOR RAILWAY-CARS AND SIMILAR STRUCTURES.

1,051,395.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed June 17, 1909, Serial No. 502,685. Renewed September 16, 1912. Serial No. 720,697.

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 the drawings accompanying the same.

This invention relates generally to the construction of metal 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.

One of its objects is to provide a light, strong, easily constructed and readily cleaned door of this general class.

Another object is to construct such a door largely of metal with means combined therewith to reinforce the same to make it sufficiently strong and rigid to do the work required of it and at the same time be of comparatively light weight and easily opened and closed.

Another object is to construct such a door largely of metal having an upper and under surface substantially smooth and without objectionable protuberances whereby the door is readily cleaned to permit the ingress and egress of passengers without soiling their clothing.

With these objects in view the invention consists in the construction, combination and arrangement of parts to be hereinafter more fully described and more particularly pointed out in the claims hereunto annexed and forming a part of this specification.

It has been found in use that trap doors such as are commonly used in passenger cars for covering the steps by which passengers enter and leave the cars not only have to be made very strong but it is desirable that they be light in weight so that they can be easily and quickly handled in the opening and closing of the same at stations. It is also desirable that they should occupy as little space as possible when open and present substantially a smooth under surface which can be quickly cleaned. It has been found that trap doors when closed accumulate more or less dust and dirt on their under sides while the trains are in motion and it is desirable to wipe off such dirt and dust upon the opening of the same, so that

the clothing of passengers will not be soiled by contact therewith in entering or leaving the cars. This cleaning or wiping off the under surface of the trap doors has to be done on the opening of the same and it is necessary that it be done quickly and effectively so as not to delay the trains at stations. In order that this cleaning may be done quickly and with little expenditure of time and labor, it is desirable that the under surface of the door be substantially smooth and without any protuberances or projections to interfere with the wiping or cleaning operation. These trap doors, like the platform or vestibule floors, where they are used, commonly receive a covering, usually in the form of a tiling, with a surface adapted to prevent those using the cars from slipping thereon and the upper surfaces of the same are preferably substantially flush with or in line with the rest of the platforms in which they are used.

Figure 1 shows in plan view a door and a section of a car or vestibule platform illustrating generally the door when in the closed condition, a portion of the upper covering or tiling of the door being broken away. Fig. 2 shows in cross section that which is seen on line 2—2 in Fig. 1, but with the tiling or covering in place. Fig. 3 shows in cross section and on an enlarged scale that which is seen at the left of Fig. 2. Fig. 4 shows in cross section on line 4—4 and on an enlarged scale a sectional portion of the door illustrating the form of reinforcing means seen in Fig. 1. Fig. 5 illustrates a door in plan view having a modified form and arrangement of reinforcing means, which means are formed to aid in holding a filling in place to form substantially a smooth surface for one side of the door. Fig. 6 shows in cross section on line 6—6 that which is seen in Fig. 5. Fig. 7 shows in cross section and on an enlarged scale a portion of the door seen on line 7—7 of Fig. 5. Fig. 8 shows in cross section on line 8—8 another portion of the door seen in Fig. 5. Fig. 9 illustrates in plan view a modified form and arrangement of reinforcing means in a comparatively narrow door which is thinner at its edges than it is at the central portion thereof, a portion of such means being tapered, as shown, as the same approaches the front and rear edges of the door. Fig. 10 shows in cross section on line 10—10 of Fig. 9 that which is there-

in seen. Fig. 11 shows in cross section on line 11—11 of Fig. 9 that which is therein seen.

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

In Figs. 1 to 4, inclusive, one embodiment of my invention is illustrated. A represents the car or vestibule platform in which the door B is hung so as to be opened and closed by means of any suitable form of hinge desired. As shown a well known form of hinge means connects the door to the platform, so that it may be readily opened and closed. The door B as there shown, is preferably made up of a top plate of metal C and an under plate D having at three of its edges bent up angle pieces b , b' and b^2 adapted to receive and hold the plates C and D, such plates being secured together by rivets as shown, or otherwise as the constructor sees fit. These bent up angle parts receive the edges of the plates C and D on three sides of the door and form a stiffening frame for the door. At the fourth edge the hinge portion E is secured to the door and such portion receives the rear edges of the plates C, D, which as shown are not brought into close proximity with one another as is the case with the edges of such plates at the other three edge portions of the door, such plates at the hinge edge being separated by collars as shown, or by any other desired means. These bent up angle parts b , b' and b^2 , at the side and front edges of the door are preferably made with suitably beveled edge portions in conformity with that which is set forth in my Patent No. 847,559, dated March 19, 1907, for trap door bindings, so that the door may be readily opened without undue binding in the opening of the platform, as shown or otherwise as the constructor desires. The plate C, as shown is preferably suitably reinforced and stiffened by ribs c , c' , c^2 , preferably arranged as seen in Fig. 1. These ribs c , c' , c^2 , are preferably bent up out of sheet metal, and they are preferably secured to the plate C as shown, but they may be secured in position to stiffen such plate in any desired manner whether arranged as seen in Fig. 1 or otherwise. These ribs c , c' , c^2 , when thus secured to the plate C reinforce and stiffen the same and thus give greater rigidity to a comparatively thin plate of metal than a much thicker plate would have, thereby aiding in obtaining a stiff and rigid door of comparatively light weight. The plate D, as shown, is preferably arranged in contact with the projecting portions of the ribs c , c' , c^2 , and it is preferably secured to the plate C as shown, forming near the side and front edges of the door stiffening or reinforcing flanges adapted to aid in making a stiff and strong door. The hinge portion E also tends

to stiffen or reinforce that part of the door to which it is attached. The upper and under surfaces of the door formed by the plates C and D are substantially smooth and are easily wiped off and cleaned. Such plates may be of the same thickness or one may be made thinner than the other as desired. The hinge portion E is preferably made in the form shown and extends substantially across the rear portion of the door and receives between its outer portions the rear edges of the plates C and D, which are preferably in contact with the outer portions of the hinge and receive between such rear edges the collars or other separating means e , e' , e^2 , etc. and such hinge portions, plates and collars are preferably secured together by rivets as shown. This hinge portion E, when secured to the plates in the manner seen in Figs. 1 and 2, strengthens and stiffens the rear portion of the door. The upper part of such hinge portion extends above the plate C and is preferably beveled to receive the rear edge of the tiling F and thereby aids in keeping such edge in close and intimate contact with the plate C to which it is secured. The tiling F is secured to the plate C in any desired manner. The bent up angle parts b , b' , b^2 , when secured to the plates C and B as shown, extend above the upper surface of the plate C and the edges of such portions nearest the center of the door are likewise beveled to receive the extreme outer side and front edges of the tiling.

The embodiment of the invention illustrated in Figs. 1 to 4 of the drawings provides a light, strong, reinforced metal trap door having a substantially flat and smooth surface adapted to receive the tiling commonly used on such doors and also a substantially smooth and easily cleaned under surface for the door which the person who opens and closes the door can readily wipe off and clean on opening the same, so that passengers entering or leaving the car will not have their clothing soiled or damaged by contact with such undersurface. If desired, the door may be constructed somewhat differently from what is seen in the embodiment illustrated in Figs. 1 to 4 and the different parts may be somewhat differently combined, and instead of there being two plates of metal employed there need not be but one; also, other means than metal may be used for making substantially flat and smooth surfaces which may receive the tiling and be readily wiped off and cleaned on the opening of the door.

A modified embodiment of the invention is illustrated in Figs. 5 to 8, inclusive, of the drawings, in which only one metal plate is used and that forms the under surface of the door, the side and front edges of such plate being flanged as shown. This plate C

has the flanges c^2 , c^4 and c^5 , which are preferably made of sufficient width to receive the tiling, if it should be used to form the upper surface of the door. These flanges also are of sufficient width to receive the reinforcing means by which the plate C' is reinforced or stiffened. In this embodiment seen in Figs. 5 to 8 the reinforcing means consist of the metal ribs b^4 , b^5 , b^6 , b^7 , b^8 and b^9 , which are preferably formed in the shape seen in Figs. 7 and 8 in cross section and which are preferably arranged relatively to one another and to the plate C' to which they are secured as shown. As seen in Fig. 5, the rib b^4 extends diagonally nearly across the plate C' and the ribs b^5 and b^6 are arranged at substantially right angles to the rib b^4 and the two likewise extend nearly across the door. The ribs b^7 , b^8 and b^9 are preferably arranged substantially parallel with the side and front edges of the door and between the ribs b^4 , b^5 and b^6 . In this embodiment, the reinforcing ribs are preferably made as shown so as to have surfaces opposite the plates to which they are attached substantially flat and of a height sufficiently less than the height of the flanges c^2 , c^4 and c^5 to receive the tiling F' , which tiling is not shown as being present in Fig. 5 of the drawings, but is seen in Figs. 6 to 8. The ribs b^4 , b^5 , etc. are preferably made as more particularly shown in Figs. 7 and 8 with the side portions flaring as there seen so that they may aid in securing a filling, which is preferably applied in a plastic state to fill the spaces between the flanged edges of the plate C' and the reinforcing ribs. This filling is preferably made of material that becomes sufficiently hardened upon exposure to remain in place and form a substantially flat and smooth surface flush with the upper surfaces of the ribs and yet be sufficiently porous for attaching the tiling thereto if tiling be used, to hold it in place. This filling may be of any desired composition of matter and applied in any desired manner and it will naturally aid in supporting the side portions of the ribs and stiffening or reinforcing the door. If desired, this filling may be of a composition of a character adapted to take the place of the tiling now used to prevent passengers from slipping when walking on the trap door. When a filling is used, as shown in said Figs. 5 to 8, inclusive, the tiling may be received on a substantially flat and smooth surface and be secured to the door in any desired manner. The hinge portion E' is preferably made to extend substantially across the rear portion of the door, that is, from the corner post of the car to the other side of the opening in which the door is hung and is constructed so as to receive the rear edge of the plate as seen in Fig. 6, or it may be

made as shown in Fig. 2 where the free edges of such hinge portion are somewhat widely separated and collars or other means are interposed so as to enable such portions to be securely attached to the plate. If desired, such hinge portion may be made in any other desired manner to enable the door to be hinged to the platform. These hinge portions, when they extend substantially across the rear edge of the door, serve a stiffening or reinforcing function for that part of the door, which function is not served by ordinary forms of hinges used on doors. It will be obvious to those skilled in the art that other means might be employed in connection with any of the ordinary forms of hinges, if it were desired, to reinforce or strengthen the rear portion of the door. It will be obvious to those skilled in this art that the flanges c^2 , c^4 , c^5 , may be formed with somewhat inclined surfaces in accordance with that which is set forth in Letters Patent, No. 847,559 for trap door bindings so as to aid in readily opening the door. If desired the parts which go to make up the trap door may be somewhat differently constructed and combined together than is the case in the embodiments illustrated in Figs. 1 to 8 inclusive of the drawings. If a plurality of plates are used in constructing the door, such plates may be secured together adjacent to their edges in the manner seen in Figs. 9, 10 and 11 of the drawings. Also instead of forming the reinforcing means as in Figs. 1 to 8 inclusive; and such means may be formed as more particularly seen in Fig. 11 of the drawings, or in any other desired manner. Also instead of arranging the reinforcing means as illustrated in Figs. 1 to 8 inclusive such means may be arranged as seen in Figs. 9, 10 and 11 of the drawings, or in any other desired manner.

In the embodiment seen in Figs. 9, 10 and 11, the door B^2 is comparatively narrow and the plates C^2 and D^2 form smooth upper and under surfaces respectively, of the door and the reinforcing means are shown as being secured to the plate C^2 . The portion of the reinforcing means, as b^{10} and b^{11} , extends from near the front to near the rear edge of the door and the portion, as b^{10} and b^{11} , is tapered in form from the central portion of the door toward the front and rear edges thereof to conform with the shape given to the plate D^2 before securing the plates together. The portion of the reinforcing means, as b^{12} , is shown as secured to the plate C^2 and is of the form shown, the same being arranged between the reinforcing means b^{10} , b^{11} , so as to aid in stiffening or reinforcing the door in its widthwise direction. The plate D^2 in the construction seen in Figs. 9 to 11, when arranged as there shown forms a portion of the reinforcing

means for strengthening and stiffening the plate C to which the angular pieces, as b^{10} , b^{11} and b^{12} are attached. The reinforcing means may be of any desired form and arranged as desired, so long as such means are adapted to serve the reinforcing function and thereby stiffen and strengthen the door. The hinge portion E^2 may be secured to the plate C^2 in the manner shown in Fig. 10, or such portion may be secured to the door in any other desired manner. Such hinge portion preferably extends substantially across the width of the door but other forms of hinges may be used if desired. Bent up angle pieces c^6 , c^7 and c^8 , somewhat similar to those seen in Figs. 1 to 4 are shown attached to the front and side edges of the door, but other forms of edge reinforcing means may be employed if desired.

In each of the embodiments herein shown, the means which reinforce or strengthen the central portions of the doors are arranged so as to act thereon between the points where the door is supported in the platform. The combinations of reinforcing means and plate or plates, as herein shown, are such that the doors are formed and strengthened somewhat upon the principle on which a "bridge truss" acts. Also in each embodiment there are means adapted to strengthen and stiffen the edges of the door and form a frame therefor, which aids in supporting the door in the platform and holding it in position under the strains which the door is necessarily subjected to in use. That portion of the reinforcing means which reinforce and stiffen the central portions of the door also stiffen and strengthen the door under the strains to which the door is subjected in use, not only from strains in a vertical direction but also in a horizontal direction, the latter strains being in a direction tending to compress the material of the door as in suddenly applying the brakes for stopping the train or otherwise.

What I have herein shown and described will naturally suggest to others skilled in this art, other specific embodiments of this invention and also modifications in the construction and arrangement of 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 have that are particularly pointed out in the claims hereto annexed, hence I do not wish to limit my invention to the specific forms and arrangements 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 claim as new is:—

1. In a trap door the combination, sub-

stantially as set forth, of two substantially smooth surfaces, one of which is adapted to form the tread portion of the door and the other of which surfaces is substantially free from protuberances and is thereby adapted to be quickly cleaned for the egress and ingress of passengers, and reinforcing means interposed between such surfaces, one portion crossing the other at an angle thereto and both projecting substantially the same distance away from one of such surfaces, such reinforcing means being arranged to reinforce the door in a line perpendicular to the tread portion thereof.

2. In a trap door, the combination substantially as set forth, of a plate adapted to form a substantially smooth surface of the door and support the tread thereof, hinging means arranged at one end of such plate and fixed to one edge thereof so as not to interrupt the smoothness of the tread surface, reinforcing means secured to the under side of the plate, and a plate adapted to form a second smooth surface on the under side of the door whereby such surface is quickly cleaned when the door is open, the under plate being engaged with said reinforcing means and secured at opposite edges to the hinging means and the upper plate, substantially as and for the purpose specified.

3. In a trap door the combination, substantially as set forth, of a plate having a substantially smooth surface for one side of the door adapted to receive reinforcing and hinging means, means for hinging the plate to the platform of the car in position for the door to form a continuation thereof, means secured to the plate, one portion of which is formed to cross another portion at angles thereto and be connected to the plate so that the crossing portion extends away therefrom for substantially the same distance at corresponding points as the other portion does, and means arranged in connection with the plate and reinforcing means to form a second smooth surface for such door.

4. In a trap door the combination, substantially as set forth, of a plate having a substantially smooth surface for one side of the door adapted to receive reinforcing and hinging means, means for hinging the plate to the platform of a car in position for the door to form a continuation thereof, means arranged in contact with the plate adapted to reinforce the same in a plurality of directions leading from the central portion of the plate for supporting a load thereon, and means arranged in connection with the plate, and reinforcing means to form a second smooth surface for such door.

5. In a trap door the combination, substantially as set forth, of a plate having a substantially smooth surface and adapted to receive a suitable tread portion for use in the platform of a car and hinging and rein-

forcing means, means adapted to hinge such plate in the platform, reinforcing means arranged to reinforce the door in a plurality of directions and be secured to the plate in contact therewith and extending away therefrom substantially the same distances at the central portions thereof, and means arranged in connection with the plate and reinforcing means to form a substantially smooth surface for the under side of such door.

6. In a trap door the combination, substantially as set forth, of a plate adapted to receive a suitable tread surface for use in a car platform, a second plate adapted to form a substantially smooth surface for the under surface of the door, hinging means adapted to hinge the door in the platform, and reinforcing means formed in two portions interposed between the two plates and arranged to reinforce the door in a plurality of directions without materially increasing the thickness of the door over what is required for one portion of the reinforcing means.

7. In a platform trap door the combination, substantially as set forth, of a plate adapted to receive reinforcing means and hinging means, reinforcing means formed separately from the plate and adapted to be secured thereto, securing means adapted to secure the reinforcing and hinging means to form a substantially smooth surface for one side of the door, and means adapted to hold the means forming such surface in position relatively to the plate in the use of the door.

8. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface adapted to form one side of the door, reinforcing means adapted to be secured to the plate for stiffening the same, means adapted to be secured in place relatively to such plate and form a smooth surface for the other side of the door, binding means adapted to be secured to the side and front edges of such plate and form a frame for three sides of the door, and hinging means adapted to hinge the door in the platform.

9. In a platform trap door the combination, substantially as set forth, of a plate having substantially one smooth surface, reinforcing means adapted to be secured to such plate for stiffening the same, hinge means adapted to hinge the door in the platform, and means adapted to be secured in place relatively to such plate and form a smooth surface, which smooth surfaces are arranged on opposite sides of the door.

10. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface, reinforcing means adapted to be secured to such plate for stiffening the same, hinge means adapted to hinge the door in the platform, binding means adapted to be secured to the side and

front edges of the door, and means adapted to be secured in place relatively to such plate and form a smooth surface, which smooth surfaces are arranged on opposite sides of the door, whereby both the central portions and edges of the door are reinforced and stiffened.

11. In a platform trap door the combination, substantially as set forth, of a plate having substantially one smooth surface adapted to form one side of the door, reinforcing means adapted to be secured to the plate for stiffening the same, hinge means adapted to hinge the door in the platform, means adapted to be secured in place relatively to such plate and form a smooth surface, which smooth surfaces are arranged on opposite sides of the door, and means adapted to stiffen and strengthen the edges of the door, whereby the central portions and edges of the door are reinforced and stiffened.

12. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface adapted to form one side of the door, reinforcing means formed of a plurality of parts of bent up sheet metal adapted to be secured to the plate and reinforce the central portion of the door in a plurality of directions, means adapted to be secured in place, relatively to such plate and form the smooth surface of the other side of the door, and hinging means adapted to hinge the door to the platform, the axial line of such means being arranged below the upper surface of the door when in the closed position.

13. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface adapted to form one side of the door, angular shaped reinforcing means formed in a plurality of parts adapted to be secured to the plate for the stiffening of the same in different directions, means adapted to be secured in place relatively to such plate and the reinforcing means to form a smooth surface on the other side of the door, which smooth surface is substantially flush with those portions of the reinforcing means which extend farthest away from said plate in a direction perpendicular to the tread portion of the door, and hinging means adapted to hinge the door to the platform without obstructing the use of the same.

14. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface, reinforcing means formed of a plurality of parts adapted to be secured to the plate in a plurality of directions, each of such parts extending away from the plate in a reinforcing direction to substantially the same extent for stiffening the same, hinging means adapted to hinge the door to the platform, and means adapted to be secured in place relatively to

such plate and form a smooth surface, one of which smooth surfaces is flat and adapted to serve as the upper side of said door, which surfaces are arranged on opposite sides thereof, whereby the central portions of the door are reinforced and stiffened.

15. In a platform trap door the combination, substantially as set forth, of a plate having one flat surface adapted to form one side of the door, reinforcing means formed of a plurality of parts adapted to be secured to the door with one part arranged at an angle to another part and thereby reinforcing the door in a plurality of directions and each of which parts extends away from the plate in a reinforcing direction to substantially the same extent for stiffening such plate, hinging means adapted to hinge the door to the platform, and means adapted to be secured in place, relatively to such plate and form a smooth surface on the other side of the door, whereby the central portions of the door are reinforced and stiffened.

16. In a platform trap door the combination, substantially as set forth, of a plate having substantially one smooth surface, reinforcing means formed of a plurality of parts adapted to be secured to the plate and stiffen it in a plurality of directions, means adapted to hinge the door to the platform without projecting upward beyond the tread surface of the door inclosed, and means adapted to be secured in place relatively to such plate and form a smooth surface for the other side of the door, which smooth surfaces are arranged on opposite sides of the door with the main portions thereof substantially equidistant from one another.

17. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface adapted to form one side of the door, reinforcing means formed of a plurality of parts adapted to be secured to the plate in angular relations to one another and stiffen the same in different directions, each of which parts has flat surfaces for securing such parts to the plate, means adapted to be secured in place relatively to such plate and reinforcing means to form a smooth surface for the other side of the door, hinging means adapted to hinge the door in the platform, and means adapted to secure the reinforcing means to the door.

18. In a platform trap door the combination, substantially as set forth, of a plate having one smooth surface adapted to form one side of the door, reinforcing means formed of a plurality of parts adapted to be secured to the plate in angular relations thereto for stiffening the same in different directions, the side portions of which are nearer together adjacent to the plate to which such parts are secured than are those portions of said parts farther away from

said plate, means adapted to secure the reinforcing means to the plate, means adapted to engage with the reinforcing means and be secured to the plate and aid in reinforcing the same in different directions and form a smooth surface for the other side of the door, and hinging means adapted to hinge the door in the platform.

19. In a platform trap door the combination, substantially as set forth, of a plate having one flat smooth surface adapted to form one side of the door, reinforcing means adapted to be secured to the plate and reinforce the same in different directions, means adapted to be secured to the plate and form a smooth surface for the other side of the door and substantially close up the edges thereof, means for securing such smooth surface to the plate, and hinging means adapted to hinge the door in the platform.

20. In a platform trap door the combination, substantially as set forth, of a plate adapted to form the tread side of the door, reinforcing means adapted to be secured to the plate and reinforce the same in different directions, means adapted to form a smooth surface for the other side of the door and be secured to the tread plate thereof near its edges, means adapted to secure such smooth surface means to the tread plate, and means adapted to hinge the door in the platform.

21. In a platform trap door the combination, substantially as set forth, of a plate adapted to form the tread side of the door, reinforcing means adapted to be secured to the plate and reinforce the same in different directions, a plate adapted to form a smooth surface for the under side of the door, means adapted to secure the plates together with the reinforcing means interposed between the plates, and hinging means adapted to hinge the door in the platform, the axial line of the hinging means being arranged in a plane between the planes occupied by the main portions of the upper and under surfaces of the door.

22. In a platform trap door the combination, substantially as set forth, of a plate adapted to form the tread side of the door, reinforcing means adapted to be secured in place to stiffen the door, a plate adapted to form a smooth surface for the under side of the door and to be secured to the plate forming the tread portion of the door adjacent to the edges thereof with the main portions of the two plates substantially equidistant from one another, means adapted to secure the plates together with the reinforcing means interposed between them, and means adapted to hinge the door in the platform.

23. A reinforced trap door comprising a metal plate adapted to form one smooth surface of the door when hinged in the platform.

form which plate has reinforcing means secured thereto in directions at angles to one another for strengthening the same and means adapted to form a substantially smooth surface for the opposite side of the door.

24. A reinforced platform trap door comprising a metal plate having a smooth surface adapted to form the tread side of the door which plate has reinforcing means secured thereto for strengthening the same in different angular directions and means adapted to form a substantially smooth surface for the under side of the door, which surfaces have the main portions thereof arranged substantially equidistant from one another.

25. A reinforced platform trap door comprising a metal plate adapted to receive hinging means for hinging it to the platform and form one smooth surface for the door, which plate is provided with reinforcing

means secured thereto for stiffening it in directions at angles to one another and adapted to form a substantially smooth surface opposite such plate and hinging means attached thereto with the axial line thereof arranged below the tread surface of the door.

26. A reinforced platform trap door comprising a metal plate having a smooth surface for one side of the door, reinforcing means formed separately from such plate which stiffen the door in directions at angles to one another and means forming a smooth surface for the other side of the door, such smooth surfaces being arranged on opposite sides of the door, one of which is adapted to form a substantially flat surface for the tread side thereof.

OLIVER M. EDWARDS.

Witnesses:

F. E. NEWBURY,
WAUEUS LIEFRUDORF.