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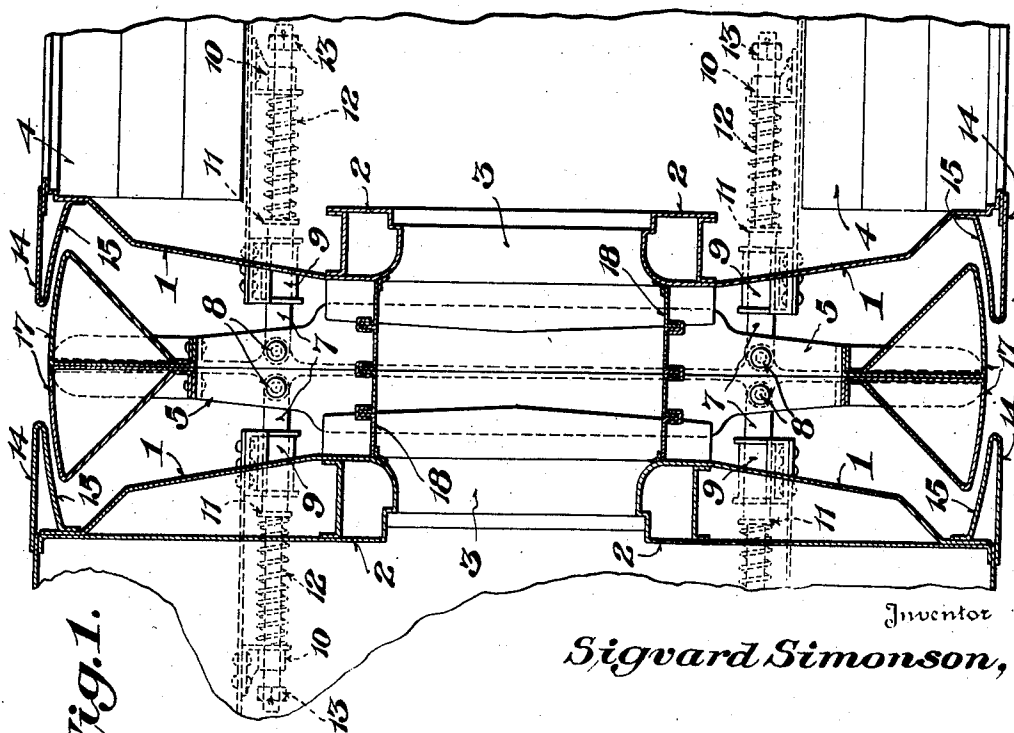
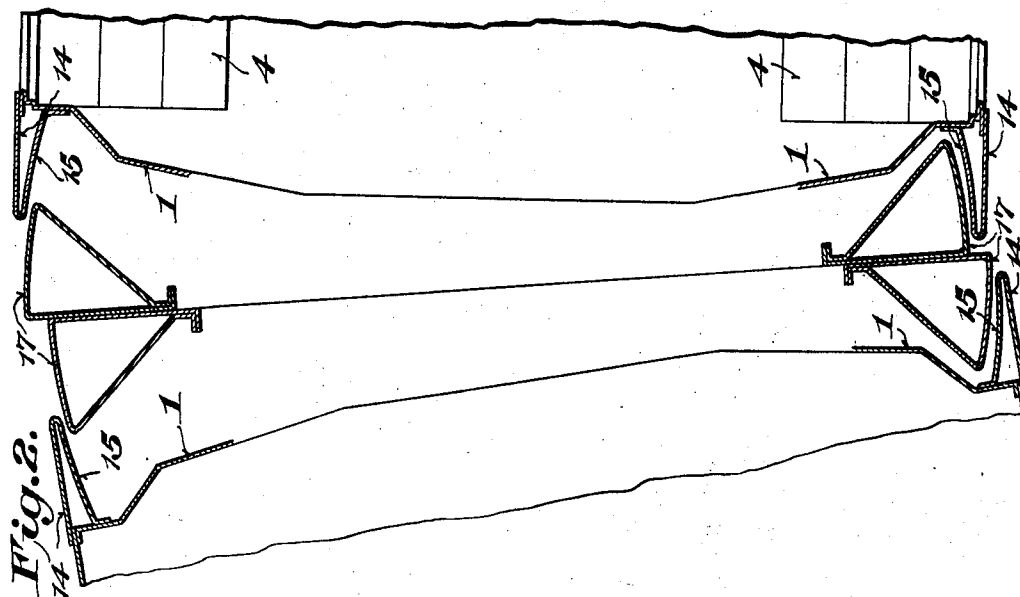
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2,124,264

CAR CONSTRUCTION

Filed March 29, 1934

3 Sheets-Sheet 1



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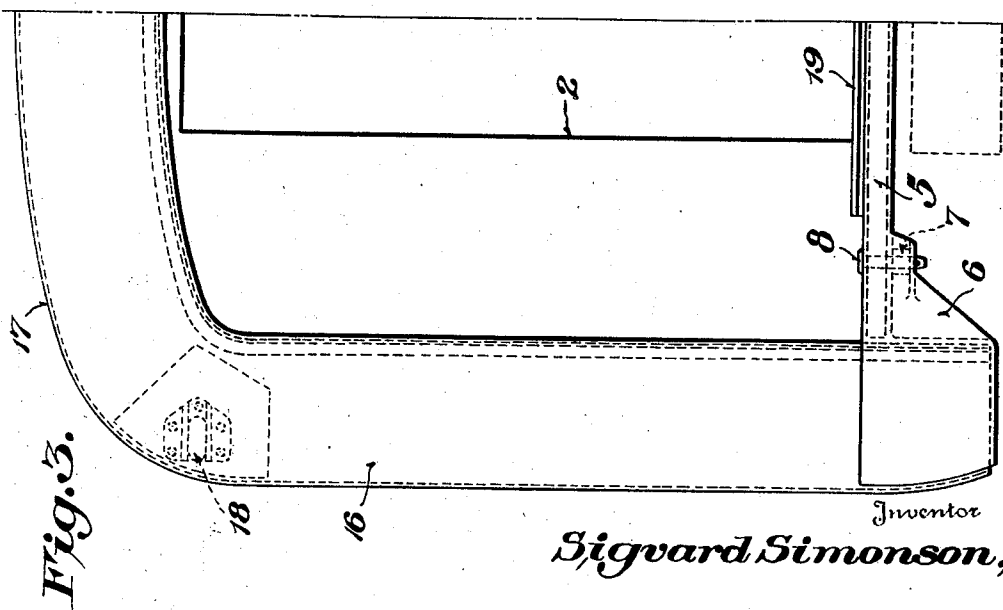
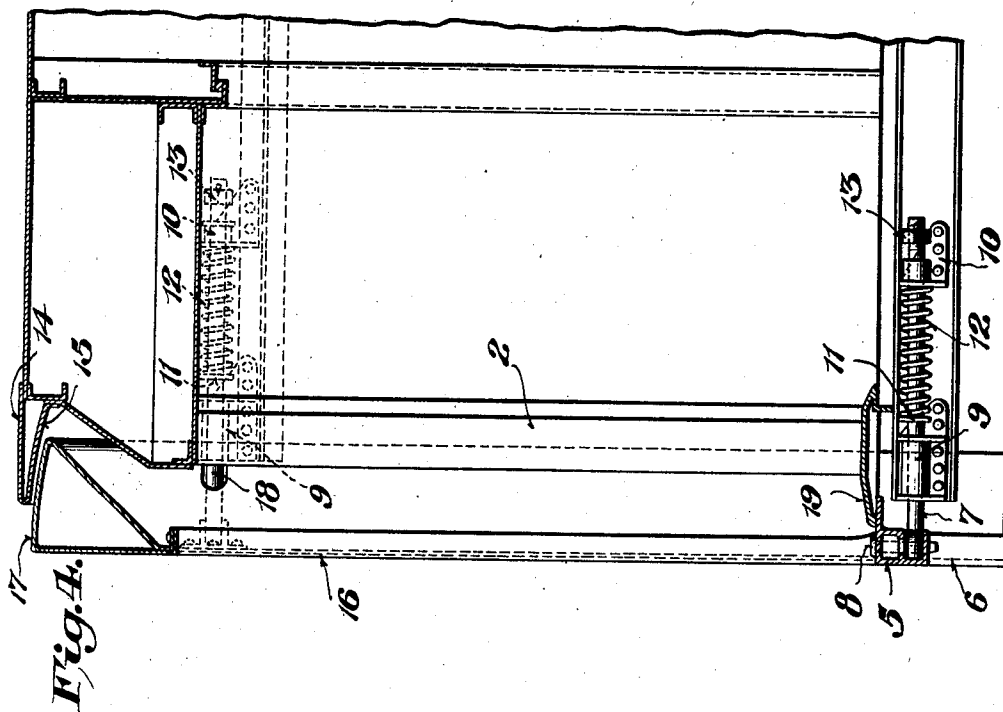
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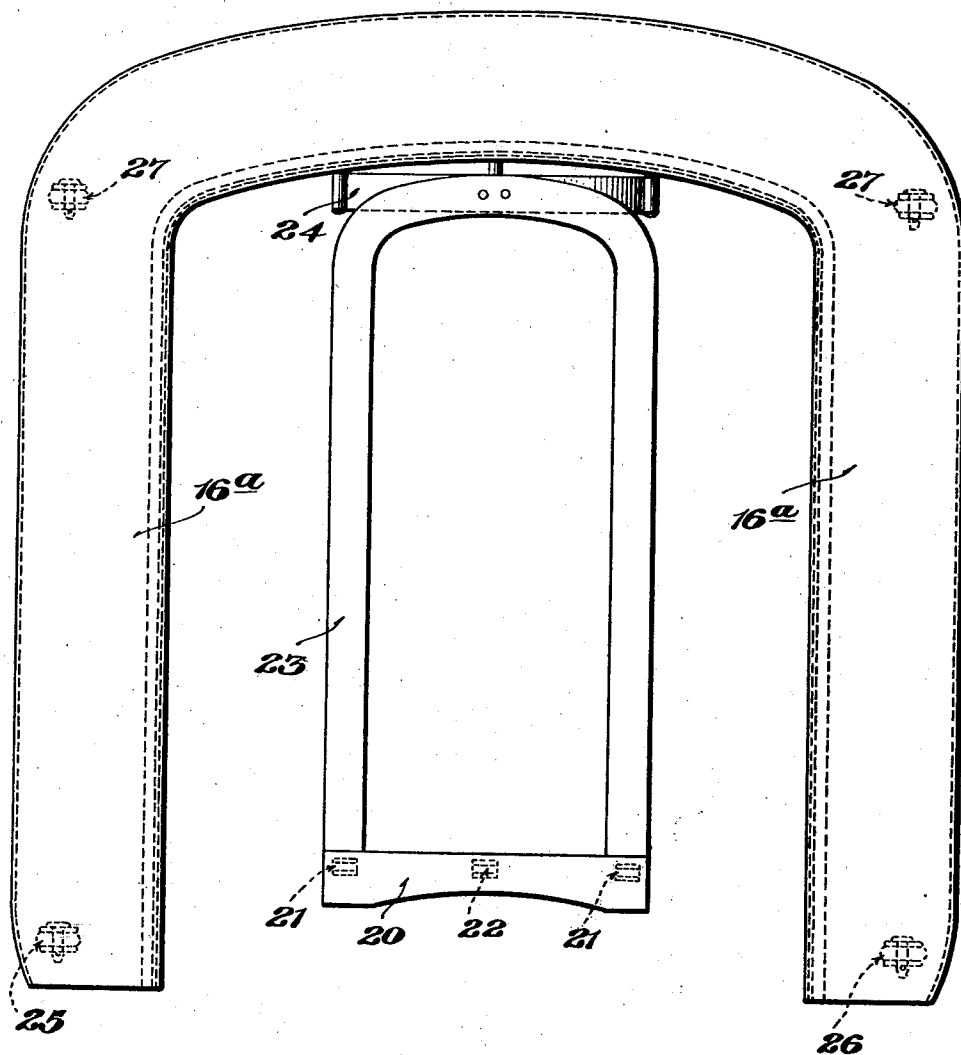
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Fig. 5.



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UNITED STATES PATENT OFFICE

2,124,264

CAR CONSTRUCTION

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17 Claims. (Cl. 105—17)

This invention relates to the construction of railway passenger cars and more particularly to a construction at the end of a passenger car whereby the adjoining ends of two coupled cars cooperate to form a substantially streamlined connection between the cars.

Present day passenger coaches are provided at the ends with closed vestibules having U-shaped frames which provide openings or doorways at the ends of the car, and means are provided to form closed passageways between the adjacent doorways of each two cars so that passengers may walk from one car to another. To this end buffer plates are provided which are resiliently mounted at each end of a coach and which carry U-shaped face plates or frames corresponding in shape to the doorways in the vestibules but spaced therefrom. The connection between each of these frames and the vestibule door frame is made by means of a fabric diaphragm or bellows. When two cars are coupled, the buffer plates and face plates or frames are in contact, but can slide laterally relative to one another as the cars go around curves or cross over from one track to another, the resilient mounting of the buffer plates being such as to permit swinging or inclination of these plates relative to the body of the car.

With a conventional construction as described, there is a considerable space between each two cars where there is nothing except a closed passage of considerably less lateral and vertical dimensions than the body of the car, leaving large pockets or recesses on both sides thereof. The increased speeds at which modern passenger trains operate render it desirable to have streamlined connections between cars so that the cross-sectional contour of the train is the same throughout its entire length. Heretofore no satisfactory means has been devised for making a connection between two passenger coaches of the conventional type which will permit the relative movements necessary when rounding curves and at the same time will preserve the streamlining between cars.

It is an object of the present invention to provide means whereby the connection between two coupled passenger coaches always has substantially the same cross-sectional contour as the body of the coach whereby streamlining of the train is secured.

Another object is to provide means of the type characterized above which means is of rigid construction, being preferably made of metal although any other suitable material may be employed.

A further object is to provide telescoping or sliding streamlining means at the end of a coach with provision for lateral displacement when rounding curves or making crossovers or turnouts.

A still further object is to provide at the end of each coach a structure mounted to move with respect to the body of the coach and to telescope with a cooperating part of the body of the coach in order to maintain a smooth, substantially unbroken surface between two coupled coaches.

One embodiment of the invention has been illustrated somewhat diagrammatically, in the accompanying drawings, but it is to be expressly understood that said drawings are for purposes of illustration only and are not to be construed as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In said drawings,

Fig. 1 is a horizontal sectional view showing the adjacent ends of two coupled cars, provided with the streamlining means between the cars (the coupling means being omitted for the sake of clearness);

Fig. 2 is a diagrammatic view illustrating the action of said streamlining means on a turnout or cross-over;

Fig. 3 is an end view of one side of the end of a passenger coach embodying the invention;

Fig. 4 is a vertical sectional view through the end of a coach embodying the invention; and

Fig. 5 is a diagrammatic end view of another construction embodying the invention, parts being omitted for the sake of clearness.

Fig. 1 shows the extreme ends of the vestibules of two adjacent passenger coaches of any suitable construction. As shown in this figure, the end wall 1 of the vestibule extends from the side of the car to a door post or frame 2 adjacent the center of the car. Between the door posts or frames 2 of each car is a passageway 3, and a portion of the steps leading to the car vestibule platform is illustrated at 4. It will be understood that this construction is duplicated on the two sides of the car and that the same construction is employed at the end of the adjacent car, the same reference numerals being employed to indicate the corresponding parts. The construction thus far described is intended to be typical of conventional car constructions now employed, and may vary considerably as to its details as it constitutes no part per se of the present invention.

It will also be understood that when the two cars are coupled together in the conventional manner, the door frames 2 at the ends of the cars are spaced apart. In the conventional car, a buffer plate is mounted at the end of the car beyond the vestibule, which has a flat outer surface adapted to contact with the corresponding buffer plate at the end of the car coupled thereto, and each buffer plate carries a vestibule face plate adapted to contact with the corresponding face plate of the other car. These buffer plates are

resiliently mounted so that when two cars are coupled, the buffer plates and face plates are resiliently maintained in contact, and the resilient mounting is such that the buffer plates can swing in a horizontal plane with respect to the bodies of the cars on which they are mounted, this being necessary on rounding curves, etc. The present invention in one form makes use of buffer plates mounted on the ends of the cars in the conventional or in any suitable manner, but instead of terminating short of the sides of the car as in the conventional construction, these buffer plates extend substantially the entire width of the car for a purpose to be described. In building new cars, the buffer plates may be designed and constructed in this way; in applying the invention to existing cars, the buffer plates may be replaced or extended in any suitable way. Owing to the greater lateral extent of the buffer plates, the resilient mountings therefor (side stems) can be spaced farther apart than in the conventional construction.

As shown in Figs. 1, 3 and 4, the buffer plates 5 extend substantially the entire width of the car, these plates being of relatively small vertical extent adjacent the central portions as clearly shown in Figs. 3 and 4 to provide room thereunder for the coupler heads. At each end however, said buffer plates are provided with downwardly extending portions 6. In the form shown, said buffer plates are carried by side stems 7 connected thereto by vertical pins 8, said stems being slidably mounted in brackets 9 and 10 rigidly secured in any suitable manner to the car body. Flanges 11 are secured on the stems 7 and springs 12 are interposed between each flange 11 and the inner bracket casting 10. The inner end of each stem 7 is threaded and carries a stop nut 13. With this construction, when two coaches are coupled together, the buffer plates come into contact and drive the stems 7 inwardly against the tension of the springs 12, so that the buffer plates are maintained resiliently in contact with one another. As usual, the openings in the bracket castings 9 and 10 through which the stems 7 pass are enlarged in order to permit lateral movement of the stems 7 therein, so that the buffer plates can in effect swing with respect to the body of the car about a vertical axis. The buffer plates of adjacent cars remain always in contact, and in order to prevent one buffer plate from riding over the other, the downwardly extending portions 6 are provided.

In order to provide the streamlining discussed above, cowling is carried by the end of the car and cooperates with a structure carried by the buffer plate. These elements are arranged to telescope within one another in order that the buffer plate may swing relatively to the car body while maintaining the streamlined surface substantially unbroken. To this end the cowling section is rigidly secured to the car body, or is formed as a part thereof, said cowling providing a longitudinally extending surface substantially as a continuation of the walls of the car, or in other words having the same cross-sectional contour as the car body. The cooperating structure carried by the buffer plate telescopes within the cowling and has a curved surface. Although these streamlining elements have no rigid connection, they can be made to fit closely together leaving only a very small opening therebetween.

Referring again to the drawings, the cowling secured to or formed as a part of the car body has a flat outer surface 14, which is substantially

a continuation of the surface of the car, and the cowling extends continuously up one side of the car, across the top and down the other side. This cowling can be made of any suitable material, as metal, and can be either an integral strip or made of several sections secured together in any suitable manner. In the form shown, the cowling comprises an integral strip having the cross-sectional form shown clearly in the drawings, that is, a strip of material V-shaped in cross-section is formed to conform to the contour of the car. The outer face of the V forms the flat surface 14 referred to above, the inner face 15 of the V being preferably curved slightly. This cowling can be secured to the car body in any suitable manner as by riveting, welding, etc., or can be made an integral part of the car when building the same. It will be understood that each end of the coach is provided with cowling of this type.

The cooperating streamlining element or structure is secured to the buffer plate 5 in any suitable manner as by riveting or welding, or if desired, it may be secured to the buffer plate in such a manner that it may in effect pivot on the buffer plate about a horizontal axis, as by employing any suitable flexible or hinged connection or by providing resilience in the ends of the buffer plate to permit some twisting about a horizontal axis. This element is also preferably of rigid material such as metal, etc. and is provided with a flat end face 16 lying substantially in the plane of the outer face of the buffer plate 5 and providing therewith a flat plane surface adapted to contact the corresponding surface of the adjacent car. Secured to the flat portion 16 in any suitable manner, or integral therewith, is an inwardly extending streamlining surface 17 adapted to fit closely within the surface 15 of the cowling, the surface 17 preferably being also curved. Preferably, and as shown, the flat surface 16 and the surface 17 are made of a single strip of material bent into triangular cross-section as clearly shown in the drawings in order to provide greater strength.

Preferably the structure 16, 17 is supported adjacent its upper portion in any suitable way similar to the means employed for supporting the buffer plate 5. As shown, resiliently mounted stems 18 are secured to said structure and are slidably mounted in brackets secured to the car body, the construction of these stems and the means for slidably and resiliently mounting the same being as shown similar to those employed for the stems 7.

It will be seen that with this construction, the end of the car presents a flat plane surface comprising the outer face of the buffer plate 5 and the outer surface 16 of the streamlining means. These surfaces are united in a unitary structure which is resiliently mounted at the end of the car and is capable of swinging movement relative to the car, while at the same time the connection between cars is made with a substantially unbroken streamlined surface. Owing to the curvature of the surfaces 17, however, the cars may round a curve as shown in Fig. 2 while maintaining substantially unbroken the continuous surface contour between cars.

In the form shown in Figs. 1 to 4, the conventional face plates and diaphragms or bellows have been omitted, although they may be retained if desired. When omitted, however, and for the convenience and safety of passengers walking from one car to the other, a light curtain or cur-

tains 18 of any suitable material may be stretched between the door posts 2, thus defining a passage-way between cars. The usual or any suitable plates 19 are also employed to form flooring across the space between the end of the vestibule and the buffer plate.

As indicated above, the invention may be employed without omitting the usual vestibule face plates and in such cases it may be desirable to mount the streamlining structure 16, 17 separately from the buffer plate, leaving the latter unchanged in the case of a car already constructed or making it of conventional form in a new car. Fig. 5 shows an end view of a car in which the invention is embodied in this way. The buffer plate 20 is of any suitable or conventional form and size and is mounted in the usual or any suitable manner, the numerals 21 indicating suitable side stems and the numeral 22 a suitable center stem for purposes of illustration. Carried by said buffer plate 20 is the usual U-shaped vestibule face plate 23, which is connected with the vestibule door frame by the usual diaphragm or bellows (not shown). The upper end of the face plate is shown resiliently connected with the roof of the car by means of a spring 24 in a conventional manner, but any other suitable construction may be employed.

It will be understood that the cowl 14, 15 is mounted at the end of the car, or built into a new car, as described above. The element 16a, 17a, as shown in the drawings, is mounted on the end of the car in the same position as in the case of Figs. 1 to 4, but independently of the buffer plate 20. Any suitable means may be provided for carrying the element 16a, 17a, provided that adequate provision is made for movement of the same relative to the car body as described above. As shown, side stems are indicated generally at 25 and 26, which side stems may be similar in construction to those previously described or of any other suitable and known type. The upper portion of the streamlining section may be supported at one or a plurality of points, 27 indicating side stems for this purpose.

The operation of the construction shown in Fig. 5 with respect to streamlining is the same as that described above in connection with Figs. 1 to 4. When cars are coupled, the buffer plates and face plates are resiliently maintained in contact in the usual manner. The surfaces 16a are also maintained resiliently in contact and the streamlining structure is capable of all movements necessary in rounding curves, making cross-overs or turnouts, etc. It will further be observed that a car having the construction of Fig. 5 may be coupled with a car having the construction of Figs. 1 to 4. Preferably the structure 16a, 17a has the same triangular cross-section as shown in Figs. 1 to 4.

It will be observed that the invention is applicable to the conventional car construction without material variation therein, or it may be embodied in new cars during the construction thereof. In applying the invention to a car already constructed, some minor variations in the manner of constructing the members and mounting them on the car may be desirable depending on the conditions encountered, but these will be readily apparent to the engineer. In building new cars, or in applying the invention to existing cars, the vestibule face plates and the diaphragms may or may not be retained as may seem desirable. In any event, however, the construction is simple and involves no interference with the conventional

and well-known methods of handling and coupling cars. The cowl and streamlining members afford a substantially tight enclosure for the space between the adjacent ends of the cars, because of the close fit between the surfaces 15 and 17, and it will be understood that if desired leather or metal wipers or other similar means may be employed to completely close the small opening between the surfaces.

The members comprising the streamlining structure may as indicated be made of any suitable material and either of one or several sections, but preferably the form illustrated in the drawings is employed because the members can be pressed from relatively light material while at the same time the construction is such as to provide rigidity and strength. If greater strength and stiffness is desired, web plates may be interposed at intervals and welded or otherwise suitably secured to the surfaces 14, 15 of the cowl or to the three surfaces of the triangular member 16, 17. It will further be understood that the contact surfaces may be treated in any suitable or known manner or faced with or made of any suitable material having anti-friction or sound-deadening qualities, so that the rubbing of these surfaces in train service does not result either in damage to the surfaces or excessive noise.

While only one embodiment of the invention has been described and illustrated in the drawings, it will be understood that the invention is capable of a variety of mechanical expressions and that changes may be made in the form, details of construction and arrangement of the parts without departing from the spirit of the invention. Reference is therefore to be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. Car construction comprising a strip of cowl-
ing at the end of the car and V-shaped in cross-
section, the outer face of the V forming sub-
stantially a continuation of the walls of the car,
a buffer plate carried at the end of the car, and
a U-shaped member carried thereby of substan-
tially triangular cross-section, one face of said
member lying in the plane of said buffer plate
and another face extending within said cowl-
ing and embraced thereby but spaced from the
inner face of the V.
2. Car construction comprising a strip of cowl-
ing at the end of the car and V-shaped in cross-
section, the outer face of the V forming substan-
tially a continuation of the walls of the car, a
buffer plate carried at the end of the car, and
a U-shaped member carried thereby of substan-
tially triangular cross-section, one face of said
member lying in the plane of said buffer plate
and another face extending within said cowl-
ing and embraced thereby but spaced from the
inner face of the V, said two adjacent faces being sim-
ilarly curved.
3. Car construction comprising cowl-
ing at the end of the car and substantially V-shaped in
cross-section, the outer face of the V forming a
continuation of the car walls and the inner face
having an arcuate shape, a buffer plate mov-
ably mounted at the end of the car and extend-
ing substantially the entire width of the car, a
U-shaped member of substantially triangular
cross-section having the ends of the legs of the
U secured to opposite ends of said buffer plate,
said U-shaped member having one face in the
plane of the buffer plate and another face ar-

cuate and extending within but spaced from the arcuate inner face of said cowling.

4. A passenger car having a vestibule with an end door for communication with an adjacent car and cowling rigidly secured thereto and extending beyond said vestibule with a contour of substantially the same size and shape as the contour of the top and sides of the car, a streamlining member of substantially the same contour as said cowling and telescoping therewithin, and means for supporting said streamlining member from the car for movement relatively thereto both parallel to the center line of the car and pivotally about a vertical axis, substantially in the center line of the car the outer surface of said member being curved substantially about said vertical axis and being adjacent to but spaced from the inner surface of said cowling so as to permit said movement of the streamlining member relatively to the car without contact between the telescoping surfaces.

5. A passenger car having a vestibule with an end door for communication with an adjacent car and cowling rigidly secured thereto and extending beyond said vestibule with a contour of substantially the same size and shape as the contour of the top and sides of the car, a buffer plate mounted at the end of the car for movement relatively thereto both parallel to the center line of the car and pivotally about a vertical axis substantially in the center line of the car, said buffer plate extending substantially the entire width of the car, and a streamlining member of substantially the same contour as said cowling and telescoping therewithin, said member being mounted on and movable with said buffer plate with its outer surface curved substantially about said vertical axis and adjacent to but spaced from the inner surface of said cowling so as to permit movement of said buffer plate and streamlining member relatively to the car without contact between the telescoping surfaces.

6. A passenger car having cowling rigidly secured thereto at its end with a contour of substantially the same size and shape as the contour of the top and sides of the car, a streamlining member of substantially the same contour as said cowling and telescoping therewithin, a buffer plate and vestibule face plate carried by said car, and means independent of said buffer plate and vestibule face plate for supporting said streamlining member from the car for movement relatively thereto both parallel to the center line of the car and pivotally about a vertical axis substantially in the center line of the car, the outer surface of said member being adjacent to but spaced from the inner surface of said cowling so as to permit said movement of the streamlining member relatively to the car without contact between the telescoping surfaces.

7. In a passenger car, a car body, a vestibule at the end of the car body, a U-shaped strip of cowling rigidly secured to and extending from the end of the vestibule, said cowling having an outer contour of substantially the same size and shape as the contour of the top and sides of the car and an inner surface of arcuate shape, a U-shaped streamlining member telescoping within said cowling and having an outer surface of arcuate shape similar to the inner surface of said cowling, and means for supporting said streamlining member from the car for movement relatively thereto both parallel to the center line

of the car and pivotally about a vertical axis, the outer surface of said member being adjacent to but spaced from the inner surface of said cowling so as to permit said movement of the streamlining member relatively to the car without contact between the telescoping surfaces.

8. Car construction comprising a strip of cowling rigidly secured to and extending beyond the end of the car, said cowling being substantially V-shaped in cross section with the outer face of the V forming a continuation of the sides and top of the car, a buffer plate mounted at the end of the car for movement relatively thereto both parallel to the center line of the car and pivotally about a vertical axis, and a streamlining member carried by said buffer plate having an outer surface telescoping within said cowling and another surface lying in the plane of the buffing surface of said buffer plate, the outer surface of said member being adjacent to but spaced from the inner face of the cowling so as to permit said movement of the buffer plate and streamlining member relatively to the car without contact between the telescoping surfaces of said member and cowling.

9. Railway car end construction adapted to provide a streamlined connection between adjacent cars when coupled together comprising cowling rigidly secured to and extending from the end of the car with a contour of substantially the same size and shape as the top and sides of the car, buffer means including a member extending substantially across the end of the car and a substantially U-shaped frame secured to said member at its ends, said buffer means being resiliently mounted on the car and movable with respect to said cowling about a substantially vertical axis disposed substantially centrally of the car and the outer edge of said frame having substantially the same shape and size as the top and sides of the car, closure means cooperating with said frame and cowling for substantially closing the opening between said frame and cowling, and closure means adjacent the center of the car end for forming a passage between cars.

10. In railway car end construction adapted to provide a streamlined connection between adjacent cars, buffer structure resiliently mounted on the end of the car for movement about a substantially vertical axis disposed substantially centrally of the car and comprising a horizontally extending member and a substantially U-shaped frame carried thereby, said structure having a vertical face in a plane transverse to the car for sliding contact with buffer structure on an adjacent car and an outer contour of substantially the same size and shape as the sides and top of the car, closure means defining a passageway at the center of said buffer structure, and closure means providing a substantially closed connection between said structure and the sides and top of the car, said last named means comprising cowling extending from the end of the car and forming a continuation of the sides and top of the car and means cooperating with said frame and cowling and substantially closing the opening therebetween.

11. In a railway car of the non-articulated type having its own trucks and couplers for connection to an adjacent car, car end construction providing streamlining between adjacent cars and comprising buffer structure resiliently mounted at the end of the car for movement about a substantially vertical axis disposed sub-

stantially centrally of the car, said structure having horizontally and vertically extending elements the outer contour of which is substantially the same as the sides and top of the car and having a flat contact face in a plane transverse to the car for sliding contact with buffer structure of an adjacent car, closure means defining a passageway at the center of said buffer structure, and closure means providing a substantially closed connection between said structure and the sides and top of the car and having substantially the same outer contour, said last named means comprising cowling carried by the car and forming a continuation of the sides and top of the car, and means extending inwardly from said structure and cooperating with said cowling to form said substantial closure.

12. In a railway car of the non-articulated type having its own trucks and couplers for connection to an adjacent car, car end construction providing streamlining between adjacent cars and comprising a horizontally extending buffer member resiliently mounted at the end of the car for movement about a substantially vertical axis disposed substantially centrally of the car and for engagement by a corresponding buffer member of an adjacent car, closure means defining a passageway at the center of said buffer member, and cooperating closure means carried by the car and by said buffer member and forming substantially an extension of the sides and top of the car, said means comprising cowling extending from the end of the car with a contour of substantially the same size and shape as the sides and top of the car, a cooperating structure carried by said buffer member and having substantially the same outer contour as said cowling, said structure being movable with said buffer member relatively to said cowling, and means extending inwardly from said structure and substantially closing the opening between said structure and cowling, said means having substantially the same outer contour as said structure and cowling.

13. In a vestibule car of the non-articulated type having its own trucks and couplers for connection to an adjacent car and a vestibule having side doors and an end door, car end construction for forming a connection with an adjacent car and comprising buffer structure resiliently mounted at the end of the car for movement about a substantially vertical axis disposed substantially centrally of the car and having a flat end face in a plane transverse to the car for sliding contact with buffer structure of an adjacent car, said buffer structure extending both vertically and horizontally and having an outer contour substantially the same as the sides and top of the car, closure means defining a passageway from said end door through the central portion of said buffer structure, and closure means having substantially the same contour as the sides and top of the car and substantially extending said sides and top to the end of the car, said last named means comprising cowling extending outwardly from the end of the car and means extending inwardly from said structure and cooperating with said cowling.

14. In a vestibule car of the non-articulated type having its own trucks and a vestibule with side doors and an end door, a horizontally extending buffer member resiliently mounted at the end of the car for movement about a substantially vertical axis disposed substantially

centrally of the car and for sliding contact with a buffer member of an adjacent car, flexible closure means extending from said end door to said buffer member to define a passageway between cars, and cooperating closure means carried by the car and by said buffer member and forming a streamlining means, said means comprising car end structure with an outer contour of substantially the same size and shape as the sides and top of the car, a structure carried by said buffer member and having substantially the same outer contour as said end structure, said structures having relative movement one within the other, and means cooperating with said structures for substantially closing the opening therebetween.

15. In a vestibule car of the non-articulated type having its own trucks and a vestibule with side doors and an end door, a horizontally extending buffer member resiliently mounted at the end of the car for sliding contact with a buffer member of an adjacent car, a vestibule face plate carried by said member and a flexible connection between said end door and face plate to define a passageway between cars, and outer closure means adapted to provide a streamlined connection between cars, said means comprising car end structure forming an extension of the sides and top of the car, a structure resiliently mounted on the car for movement about a substantially vertical axis disposed substantially centrally of the car and having an outer contour of substantially the same size and shape as the sides and top of the car, and means extending inwardly from said last named structure and movable within and in close proximity to said car end and cooperating therewith to form a substantially complete closure therebetween.

16. In a passenger car provided with a vestibule having side doors and an end door, car end construction for forming a streamlined connection between cars comprising buffer structure resiliently mounted at the end of the car for movement about a substantially vertical axis disposed substantially centrally of the car and having a flat end face in a plane transverse to the car for contact with buffer structure of an adjacent car, the outer contour of said buffer structure being substantially the same as the sides and top of the car, closure means defining a passageway from said end door through the central portion of said buffer structure, and streamline closure means having substantially the same contour as the sides and top of the car and cooperating with the sides and top of the car and with said buffer structure to form substantially an extension of the sides and top to the end of the car, said last named means permitting movement of said buffer structure relative to the car body on its resilient mounting.

17. In a railway vehicle, body structure including pockets adjacent the sides and top thereof, and a movable end member of rigid structure adjacent said body structure and including side and top aprons telescopically received in said pockets and in streamline relation with the sides and top of said body structure, there being a vertical pivotal mounting for said end member at a point spaced from said body structure constructed and arranged to provide pivoted movement of said end member about a substantially vertical axis disposed substantially centrally of the car.

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