R. M. BROWN.

CAR DIAPHRAGM.

APPLICATION FILED MAY 16, 1914.

1,167,973.

Patented Jan. 11, 1916.

2 SHEETS—SHEET 1.

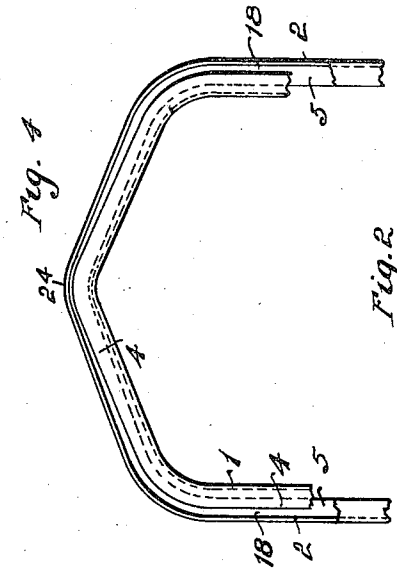


Fig. 4

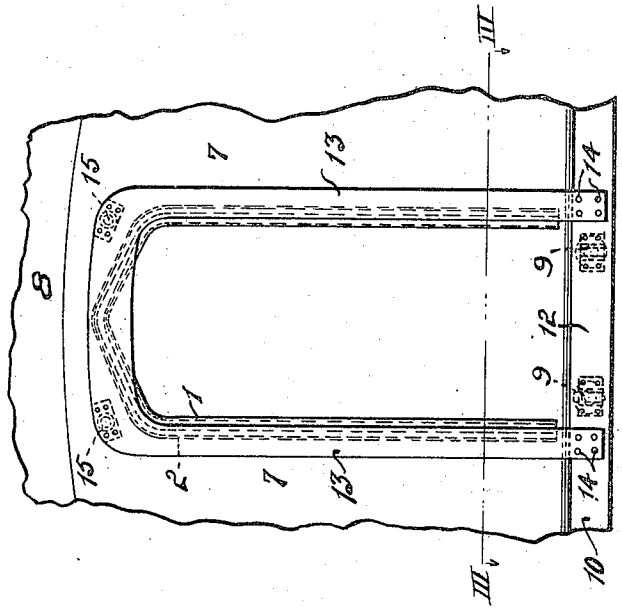


Fig. 2

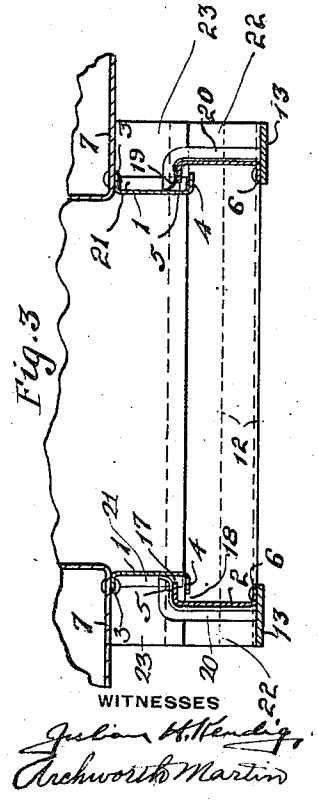


Fig. 3

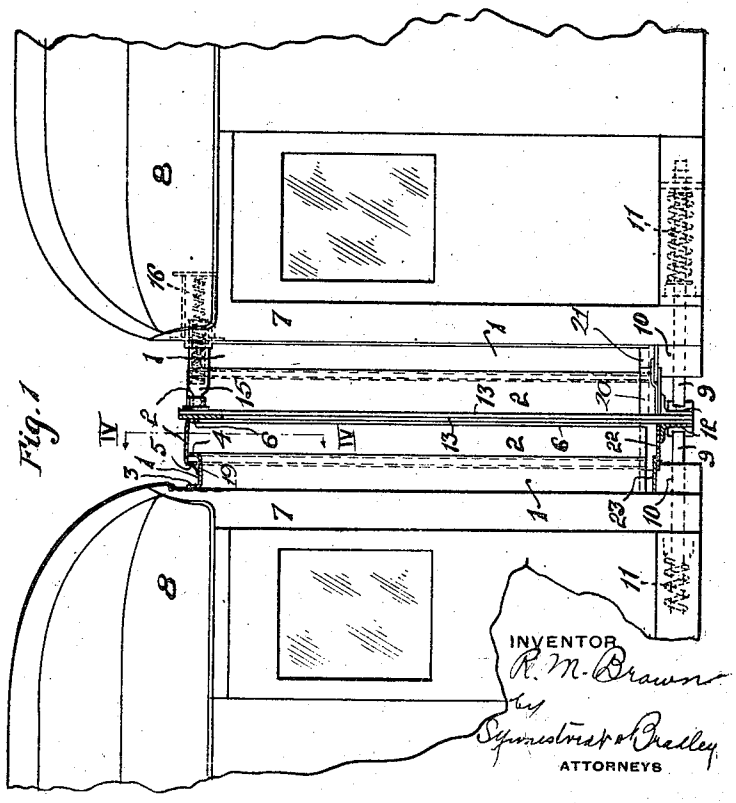


Fig. 1

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5

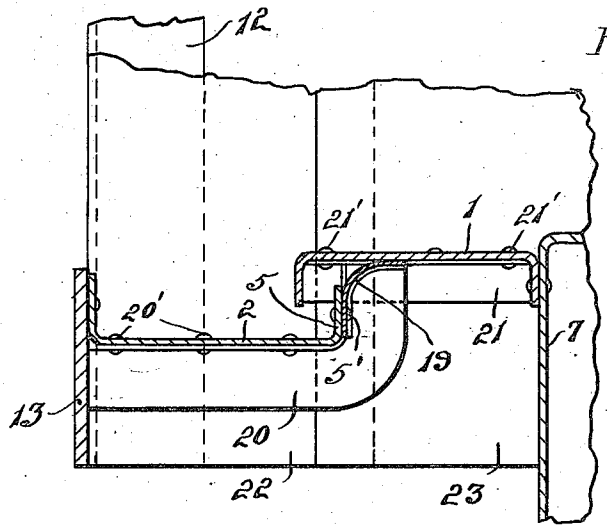
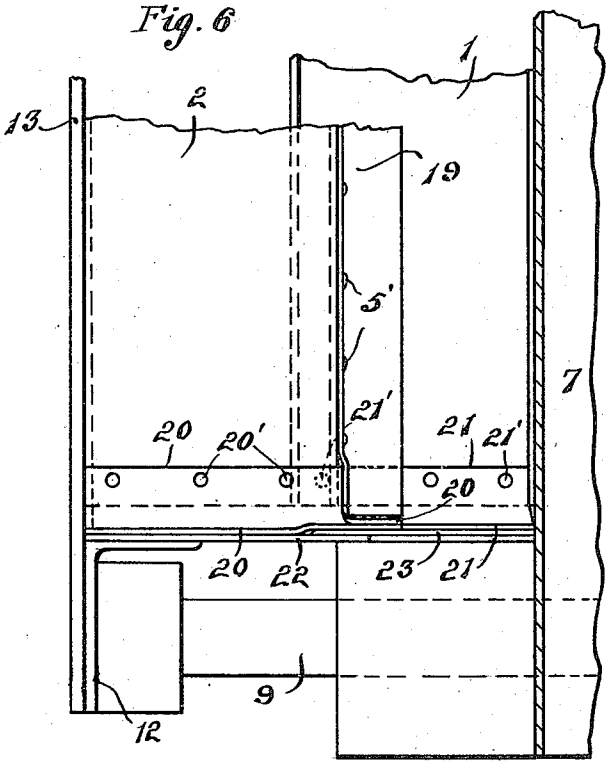


Fig. 6



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CAR-DIAPHRAGM.

1,167,973. Specification of Letters Patent. Patented Jan. 11, 1916.

Application filed May 16, 1914. Serial No. 838,922.

To all whom it may concern:

Be it known that I, RAY M. BROWN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Car-Diaphragms, of which the following is a specification.

This invention has reference particularly to an improved form of mechanism for closing the space between the vestibule of two passenger cars, and has for its principal objects the provision of a diaphragm of strong and durable construction, the provision of a diaphragm that is practically dust proof and fire proof and the provision of a diaphragm that is easily assembled and disassembled and practically noiseless in its operation.

The above, as well as such other objects as may hereinafter appear, I attain by means of a construction which I have illustrated in preferred form in the accompanying drawing wherein—

Figure 1 is a side elevation of the ends of two adjoining cars showing the diaphragm of one of the cars in vertical section; Fig. 2 is an end elevation of a portion of the end of a car showing the diaphragm attached thereto; Fig. 3 is a horizontal section of the diaphragm taken on the line III—III of Fig. 2; Fig. 4 is a vertical section of a portion of the diaphragm taken on the line IV—IV of Fig. 1. Fig. 5 is an enlarged drawing of the right hand portion of Fig. 3, and Fig. 6 is a side elevation of the apparatus shown in Fig. 5.

Referring now more particularly to Figs. 1 and 2, it will be seen that I have therein illustrated a diaphragm as applied to the end of a car, and consisting of two inverted U shaped plates 1 and 2, of metal or other suitable material, arranged so that one end of the plate 1 telescopes within the end of the plate 2. The smaller or inside plate 1, is provided at its edges with the outwardly extending flanges 3 and 4, Figs. 1 and 3, and the outside plate 2, is provided with the inwardly projecting flanges 5 and 6. By referring to Figs. 1 and 2 it will be seen that the plates 1 and 2 are bent in such manner as to provide an inclosed passageway between the car vestibules 7 at the end of cars 8, the said plates forming both the side walls and top of the passage.

The inside plate 1 is preferably secured to the car vestibule 7, and supported rigidly thereby, the flange 3 being riveted or otherwise secured to the end of the vestibule. The outside plate 2 is carried by the spring buffers 9, which may be of any approved type such as the one illustrated in Fig. 1. The type illustrated consists of the buffer member 9 mounted in the end sill 10 of the car body and normally thrust outward from the end of the car by the spring 11. In the usual construction, there are provided two buffers 9 connected by a buffer plate 12 and when two cars are coupled together these buffer plates are held in engagement with one another and serve to absorb shocks incident to sudden relative movement between the cars. To this buffer plate 12 is secured the face plate 13 which conforms generally in shape to the diaphragm plate 2, the faced plate being secured to the buffer plate by rivets or bolts 14 passing through the face plate at its lower ends.

The face plate 13 is yieldingly supported at its top portion by means of the auxiliary buffers 15 which are slidably mounted in the top of the vestibule 7, and normally thrust outward from the end of the car by means of the springs 16. These auxiliary buffers 15 may be of any approved type, as the buffer mechanism including the face plate is of the approved type at present in common use.

The flange 6 of the outside plate 2 is riveted or bolted to the face plate 13 and the plate 2 is therefore carried by the buffer and moves with the buffer plate 12. When two cars are coupled together the face plates 12 on each car will abut one another on their outside faces and remain in close contact regardless of the various relative movements of the cars. It will thus be seen that there will be considerable relative lateral movement of the diaphragm plates 1 and 2 especially when the cars are rounding a curve, and that there will be some relative vertical movement, such movement being limited however by the vertical limit of the buffer, and therefore will be less than the lateral movement.

To provide for a maximum relative movement of the plates 1 and 2, the plates are spaced apart (see Figs. 1, 3 and 4) so that they are normally out of engagement with

each other. In order that a minimum amount of air or dust can penetrate the clearance space of a given width, the diaphragms are provided with the overlapping flanges previously referred to.

It will be noted that the flanges 4 on the plate 1 overlap the flange 5 on the plate 2 and that the spaces 17 and 18 are provided between the edges of the flanges and the sides of the plates 1 and 2. Air and dust must traverse an irregular path in order to get within the diaphragm, and the passage of air and dust is further prevented by means of flexible weather strips 19, Figs. 3, 5 and 6, secured to the outside of the flange 5 on the diaphragm plate 2 by means of rivets 5′ or some other convenient form of fastening. This weather strip may be made of leather, fabricated rubber or any suitable flexible material, and is held in slidable engagement with the outside of the diaphragm plate 1 by the tension of the fabric or by the exterior wind pressure. Similar weather strips 20 and 21 are secured to the bottom of the plates 2 and 1 respectively and slidably engage the overlapping floor plates 22 and 23 which comprise the floor of the passage between the cars. Thus dust and air are excluded at all points around the diaphragm.

Referring to Figs. 5 and 6, the weather strip 20 is secured to the plate 2 by rivets 20′, and is bent around the flange 5 so as to overlap the strip 21 which is secured to the plate 1 by the rivets 21′. The vertical strip 19 at its lower extremity overlaps the upstanding edge of the strip 20, and extends to the horizontal portion thereof. The arrangement of weather strips above described insures a dust tight closure between the diaphragm sections and between the diaphragm and the floor plates.

Referring to Fig. 4 which illustrates the preferred shape of the top portion of the diaphragm, which is angular, it will be observed that the plates have two straight sloping roof portions with the apex of the angle at the center of the top portion. The angle of the straight sloping portions of the outside plate 2 is greater than the angle of the straight sloping portions of the inside plate 1, which construction prevents the flange 4 on the plate 1 from engaging the top straight sloping portions of the inside of the plate 2, at any other than one point, such point of engagement being at the apex. This is also the case with respect to the flange 5 engaging the apex of the plate 1. In the normal operation of the diaphragm the space between all parts of the diaphragm is sufficient to prevent engagement of the plates, thereby eliminating all wear and noises that would be due to friction were the plates to engage one another when in operation.

In addition to the advantage of the angular roof or top portion of the diaphragm in preventing the binding of the plates should they in an extreme case, engage one another, the angular roof provides an efficient water shed, as well as a construction on which cinders will not accumulate.

The diaphragm is assembled by first securing the inside plate 1 to the car vestibule and then sliding the outside plate 2 which has been secured to the face plate 13 over the top of the plate 1. The face plate 13 is then secured to the buffer plate 12.

If the outside plate 2 were secured to the car instead of the plate 1 it would not be possible to remove the plate secured to the face plate 13 without first removing the plate secured to the car. For this reason the smaller inside plate is secured to the car and the larger outside plate secured to the face plate.

The provision of a steel diaphragm has many advantages over the accordioned fabric type of diaphragm now in common use in that it is fire proof, indestructible under ordinary usage, and when applied to a steel car improves the general appearance of the car because all material used in the car construction is then the same and subject to the same external finish and decoration.

What I claim is:—

1. The combination with a car having a yielding buffer, of a pair of independently mounted overlapping diaphragm side members spaced apart to permit of angular movement in a horizontal plane, one of such members being carried by the buffer and the other being carried by the car.

2. The combination with a car having a yielding buffer, of a pair of independently mounted overlapping diaphragm members spaced apart, one of such members being carried by the buffer and the other being carried by the car and a yielding weather strip secured to one of the members adapted to slidably engage the other member.

3. In combination in a car having a yielding buffer, a diaphragm side member carried by the buffer having an inwardly projecting flange, and a diaphragm member carried by the car adapted to telescope with the first diaphragm member having an outwardly projecting flange, the latter member extending within the former member and being spaced therefrom when operative to permit of angular movement in a horizontal plane.

4. In combination in a car having a yielding buffer, a diaphragm side member carried by the buffer having an inwardly projecting flange and a diaphragm member carried by the car adapted to telescope with the first diaphragm member having an outwardly projecting flange, the said flanges being overlapped and having their edges spaced from

the adjacent diaphragm when such diaphragms are telescoped to permit of angular movement in a horizontal plane.

5. In combination in a car having a yielding buffer, a pair of independently mounted telescoping diaphragm side members spaced apart and provided at the overlapping ends with overlapping flanges, each flange being out of contact with the body of the other member to permit of angular movement in a horizontal plane, one of such diaphragms being carried by the buffer and the other carried by the car.

6. In combination in a car having a yielding buffer, a pair of independently mounted telescoping diaphragm members spaced apart and provided at the overlapping ends with overlapping flanges, one of such diaphragms being carried by the buffer and the other by the car, and a yielding weather strip secured to one of such flanges adapted to slidably engage the adjacent diaphragm.

7. In combination in a car having a yielding buffer, a pair of telescoping diaphragms one of which is carried by the buffer and the other carried by the car, such diaphragms comprising a pair of wall portions and an angular top portion, the angle of the top portion of the outside diaphragm member being greater than the angle of the top portion of the inside diaphragm member.

8. In combination in a car having a yielding buffer, a diaphragm side member carried by the buffer having an inwardly projecting flange, a diaphragm side member carried by the car telescoping within the first member having an outwardly extending flange, the said flanges being overlapped, each flange being out of contact with the body of the other member to permit of angular movement in a horizontal plane.

9. In a diaphragm for cars having a yielding buffer, a pair of telescoping diaphragm side members provided with overlapping flanges limiting longitudinal movement of the diaphragms, each flange being out of contact with the body of the other member to permit of angular movement in a horizontal plane, the inside diaphragm being carried by the car and the outside diaphragm being carried by the buffer.

10. The combination with a car having a yielding buffer, of a metallic diaphragm side member carried by the buffer, and a metallic diaphragm side member carried by the car between the first diaphragm member and the car, the said diaphragm member being overlapped and spaced apart to permit of angular movement in a horizontal plane.

11. A diaphragm for car ends having yielding buffer plates, comprising diaphragm side members one of which is secured to the car body adjacent the door-way and another of which is secured to the buffer mechanism, said members being spaced apart and overlapped at their free edges, and means for bridging the space between said diaphragm members.

12. A diaphragm for car ends having yielding buffer plates, comprising diaphragm members one of which is secured to the car body adjacent the door-way and another of which is secured to the buffer mechanism, said members being overlapped at their free edges and having their opposed faces spaced apart, and a weather strip secured to one of the members and adapted to slidably engage the opposed face of the adjacent member.

13. A diaphragm for car ends having yielding buffer plates, comprising diaphragm side members one of which is secured to the car body adjacent the door-way and another of which is secured to the buffer mechanism, said members being overlapped at their free edges and having their opposed faces spaced apart, the free edge of one member flanged toward the opposed face of the other member and out of contact therewith to permit of angular movement in a horizontal plane.

14. A vestibule passageway diaphragm for railway cars, comprising a pair of overlapped telescopic diaphragm members, the inner member being provided with attaching means for connection with a car-end, and the outer member being of a size and shape to be assembled with the inner member by being placed downwardly astraddle thereof, and provided with attaching means for connection with a buffer.

15. A vestibule passageway diaphragm for railway cars, comprising a pair of overlapped telescopic diaphragm members, the overlapped portions of the members having overlapped transverse flanges, the inner member being provided with attaching means for connection with a car-end, and the outer member being of a size and shape to be assembled with the inner member by being placed downwardly astraddle thereof, and provided with attaching means for connection with a buffer.

16. A vestibule passageway diaphragm for railway cars, comprising a car-end diaphragm member, and a face-plate diaphragm member, the two members being telescopically overlapped and the car-end diaphragm member being within the face-plate diaphragm member and provided with an external flange extending toward the outer diaphragm member, and the other diaphragm member having an internal flange extending toward the inner member, the said flanges being overlapped and forming a break joint obstruction to the passage of dirt through the joint between the overlapped portions of the diaphragm members, and the face-plate diaphragm member being capable of being assembled with the car-end

diaphragm member by being placed downwardly astraddle thereof.

17. A vestibule diaphragm for cars having a yieldingly mounted buffer and face plate, comprising a plurality of diaphragm side members telescopically arranged and connecting the face plate and car end, each succeeding member being arranged in a different plane from and outside of the preceding member as viewed longitudinally of the car, the successive members being laterally spaced apart to permit of angular movement in a horizontal plane and having overlapping marginal portions provided with means for bridging the space therebetween.

18. A vestibule diaphragm for cars having a yieldingly-mounted buffer and face plate, comprising a plurality of diaphragm side members telescopically arranged and connecting the face plate and car end, each succeeding member being arranged in a different plane from and outside of the preceding member as viewed longitudinally of the car, the successive members being laterally spaced apart to permit of angular movement in a horizontal plane and having overlapping marginal portions provided with interengaging flanges for preventing separation of the members.

19. A vestibule diaphragm for cars having a yieldingly mounted buffer and face plate, comprising a plurality of diaphragm side members connecting the face plate and car end, said members arranged to telescope with each other to permit a contraction of the space between the car end and face plate to a distance substantially equal to the length of one of said members, the members being laterally spaced apart to permit of angular movement in a horizontal plane to provide for unhampered telescopic action in a contracting direction and having interengaging parts to prevent separation.

20. A vestibule diaphragm for cars having a yieldingly-mounted buffer and face plate, comprising a plurality of diaphragm side members connecting the face plate and car end, said members overlapping each other and provided marginally with flanges interengaging at the outer limit of movement short of separation, the body portions of all the members lying in longitudinally-extending spaced parallel planes on the two sides of the engaging flanges and the flanges lying in the spaces between said planes, whereby to permit unhampered inwardly telescopic movement to permit of angular movement in a horizontal plane to provide for a contraction of the space between the car end and face plate to a distance substantially equal to the length of one of said members.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

RAY M. BROWN.

Witnesses:
STEVE SCHILLY,
C. R. GAULT.

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