March 26, 1929. J. F. O'CONNOR 1,706,462

RAILWAY CAR VESTIBULE DIAPHRAGMS

Filed Jan. 27, 1927

Fig. 1

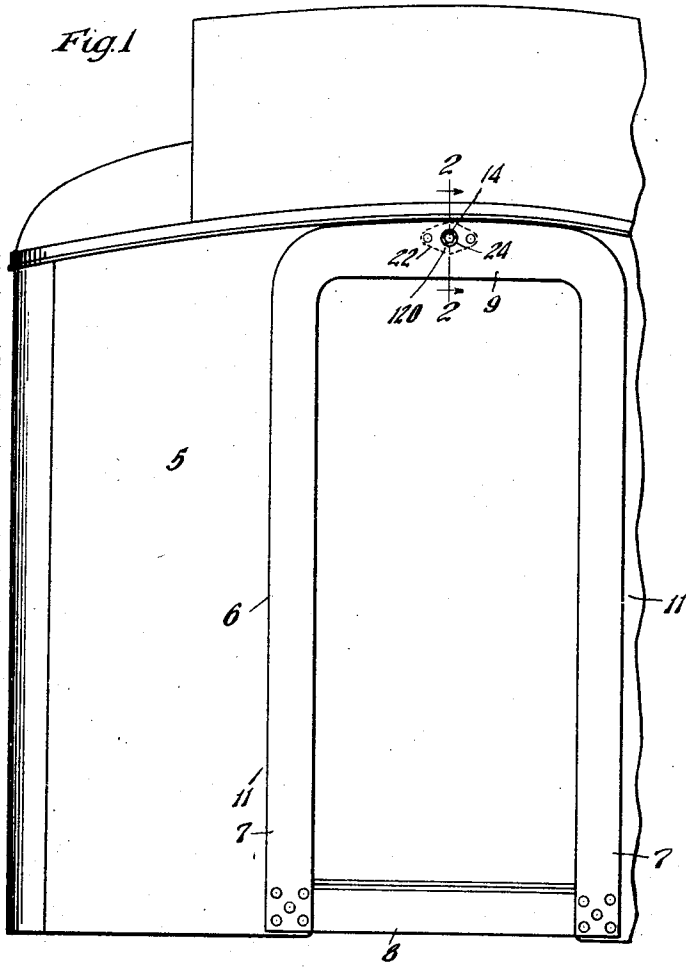


Fig. 3

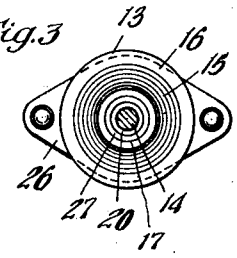


Fig. 4

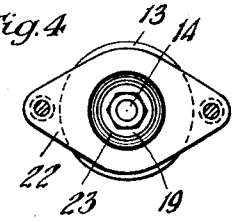
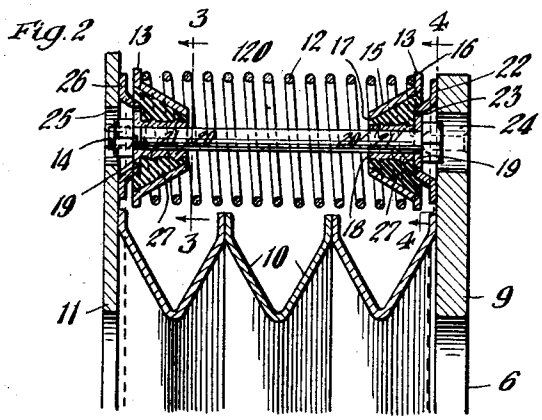


Fig. 2



Witness

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His Atty.

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UNITED STATES PATENT OFFICE.

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RAILWAY-CAR-VESTIBULE DIAPHRAGM.

Application filed January 27, 1927. Serial No. 164,014.

This invention relates to railway car vestibule diaphragms.

The invention more particularly relates to connections between the face plate of a vestibule diaphragm and the end wall of the car, wherein yieldable means are utilized for maintaining the diaphragm in distended condition.

Heretofore connections of this character have been employed, a common form of which includes a retaining bolt slidably engageable with the end wall of the vestibule and connected with the face plate, with a coiled spring disposed about the bolt for maintaining the diaphragm distended; other constructions include yieldable means of various kinds interposed between the vestibule end wall and face plate, usually in the form of coil springs with some means of retaining the same in position. All of these constructions, as well as all other known forms, are open to a very serious objection in that due to vibration, they develop a very considerable amount of unnecessary noise.

An object of the present invention is to provide a connection between the end wall of the vestibule and face plate of the diaphragm which yieldably maintains the diaphragm in distended condition, and which is entirely noiseless in operation. A more specific object of the invention resides in providing a coil spring interposed between the end wall of the vestibule and diaphragm face plate, together with a retaining means, and providing a construction in which vibration absorbing material is interposed in the connections of the yieldable means with the diaphragm face plate, the end wall of the vestibule, and the retaining means.

Other and further objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming part of this specification, Figure 1 is a fragmentary end elevation of a car and vestibule diaphragm, showing the invention applied thereto. Figure 2 is a fragmentary enlarged longitudinal sectional view through the diaphragm connection taken substantially on the line 2—2 of Figure 1. Figure 3 is a transverse sectional view of the diaphragm face plate connection taken substantially on the line 3—3 of Figure 2. And Figure 4 is a transverse sectional view of the invention taken substantially on the line 4—4 of Figure 2.

As shown in the drawings, 5 represents the end wall of the vestibule of a railway car, 6 denotes a U-shaped diaphragm face plate of common construction, the legs 7—7 of which have their lower ends riveted to the buffer plate 8, the upper ends of the legs 7—7 being connected by a transverse portion indicated at 9. As best shown in Figure 2, the diaphragm cover 10 is connected to the end plate 11 surrounding the vestibule opening, and to the diaphragm face plate 6.

The invention, indicated as a whole by the reference character 120, is interposed between the upper end of the end plate 11, and the upper portion of the transverse portion 9 of the diaphragm face plate. The invention comprises an expansible coiled spring 12, the opposite ends of which bear upon oppositely disposed followers 13—13, which are of like construction and loosely fitted about a retaining bolt 14. The followers 13—13 are alike except for their opposite disposition and only one of the same will be described in detail. Each follower includes an annular divergent or funnel-shaped wall 15, and an annular flange 16 against which one end of the spring 12 bears, the end of the follower opposite the flanged end being provided with an opening 17 of considerably larger diameter than the diameter of the retaining bolt 14, and avoids "metal to metal" contact.

Slidably mounted upon the ends of the retainer bolt 14 are oppositely disposed sleeves 18—18, both of said sleeves being of similar construction except for their opposite disposition, one of the sleeves bearing against the head of the bolt, and the other of the sleeves bearing against a nut on the bolt, whereby the sleeves are freely slidable inwardly toward each other but are limited in their outward movement by the head of the bolt and the nut thereon. Each of the sleeves 18 is provided upon its outer end with an annular shoulder 19 of larger diameter than the body 20 of the sleeve, the body 20 being provided with a plurality of annular ribs 21.

The transverse portion 9 of the face plate is provided with a boss member 22 secured thereto by suitable means, said boss member being provided with an opening 23 larger than the flange 19 on the sleeve 18. In alignment with the opening 23 in the boss member is an opening 24 in the portion 9 of the face plate, the retainer bolt 14 and the sleeve 18

being arranged to freely move through the opening in the boss member 22 and through the opening 24 in the face plate. The end plate 11 of the vestibule is also provided with an opening 25 which is arranged in alignment with the opening in a boss member 26, secured to the inner surface of said end plate which is identical in construction with the boss member 22, except for its opposite disposition, the boss member 26 being adapted to permit free slidable movement of the inner end of the bolt 14 with the sleeve thereon.

Interposed between each follower 13 at each end of the bolt 14, and each sleeve 18 at each end of said bolt, is a vibration absorbing or cushioning member 27 which conforms in shape to the annular wall 15 of the follower, and to the body portion 20 of each sleeve 18. Each cushioning member 27 in its outer face is provided with an annular recess adapted for the reception of the off-set wall of each boss member 22 and 26, the engagement of the cushioning members 27—27 upon said bosses serving to retain the entire mechanism in operative position.

In operation, the coiled spring 12 urges the followers apart, sliding movement of the followers being limited by reason of their connection with the cushioning members 27—27 and the sleeves 18—18 on the bolt 14, the sleeves being limited in outward movement by the head of the bolt and the nut thereon, the device in normal condition maintaining the diaphragm in distended condition. The device is maintained in position by the bearing engagement of the cushioning elements 27—27 upon the bosses 22 and 26, and it should be noted that the sleeves and followers are spaced from the bosses. When the ends of adjacent cars approach, the diaphragm plate 6 is moved inwardly toward the end plate 11 of the vestibule, and due to the engagement of the bosses 22 and 26 with the cushioning members 27—27, which bear upon the followers 13—13, the spring 12 will be compressed, the retaining bolt 14 projecting through the openings 24 and 25 in the face plate and end plate respectively. When the ends of the adjacent cars again separate, the spring 12 bearing upon the followers, which through the cushioning members 27 bear upon the bosses 22—26, will again force the diaphragm in a distending direction, the retaining bolt resuming its original position by sliding through the sleeves 18—18.

By the above described arrangement it will be noted that the cushioning means are so disposed and constructed that vibration between the spring and the diaphragm plate and vestibule end plate is absorbed, and that vibration between the retaining bolt, the face plate, and vestibule end plate, and the spring 12 is prevented, resulting in a construction where all noise due to vibration between the parts is eliminated.

It will also be noted that the openings 24 and 25 are of considerably larger diameter than the head and nut of the bolt and also that the openings 23 in the bosses 22 and 26 are of larger diameter than the flanges 19 on the sleeves 18. With this arrangement, the diaphragm face plate may shift laterally or vertically with respect to the vestibule end 9 as occurs in actual service and such lateral or vertical movement is accommodated by the cushioning bodies 27 which bear on the bosses 22 and 26, without any metal coming in contact with other metal. That is, my improvements provide not only for the usual straight line back and forth movements of the diaphragm face plate but for the frequent lateral and vertical shifts, the cushioning bodies 27 functioning more or less as universal joints for this purpose.

While I have herein shown and described what I consider the preferred manner of carrying out the invention, the same is merely illustrative, and I contemplate all changes and modifications which come within the scope of the claims appended hereto.

I claim:

1. In a railway car having a vestibule end and a diaphragm face plate movable toward and from the vestibule end, the combination with spring means normally yieldingly urging the face plate outwardly; of noise absorbing means for supporting said spring means on the vestibule end and face plate comprising: followers for the opposite ends of said means, a rod-like member shouldered at its ends, and bodies of non-metallic sound deadening material interposed between each of said followers and said member, said bodies also being interposed between said followers and the face plate and vestibule end respectively, said member being always out of contact with the vestibule end and face plate whereby movement of the face plate relative to the vestibule end is accommodated without metal to metal contact between said followers and adjacent parts.

2. In a railway car having a vestibule end and a diaphragm face plate movable toward and from the vestibule end, the combination with bearing portions on said end and face plate; of bodies of sound-absorbing material bearing against said bearing portions and universally yieldable upon said bearing portions; followers disposed on the opposite sides of said sound-absorbing bodies, said followers being always maintained spaced from the vestibule end and face plate respectively; and resilient means interposed between said followers whereby the face plate may shift laterally relative to the vestibule end and metal to metal contact between said followers and the vestibule end and face plate respectively is eliminated.

3. In a railway car having a vestibule end and a diaphragm face plate movably mounted

with respect thereto, the combination with apertured bosses secured to the opposed faces of said end and face plate; of a coil spring; followers at each end of said spring and spaced from said bosses; a body of resilient sound-deadening material interposed between each follower and the corresponding adjacent boss whereby the follower is adjustable relative to said boss; sleeves disposed within said bodies of sound-absorbing material, said sleeves being free from contact with said bosses; and a rod having shouldered ends extending through said sleeves and likewise free from contact with said bosses and face plate, said end and face plate having enlarged apertures in alinement with said rod to thereby accommodate the latter upon relative approach of said end and face plate.

In witness that I claim the foregoing I have hereunto subscribed my name this 24th day of January, 1927.

JOHN F. O'CONNOR.