

April 8, 1930.

R. J. LUSSE

1,754,112

AMUSEMENT CAR CONSTRUCTION

Filed Sept. 25, 1928

5 Sheets-Sheet 1

Fig. 1.

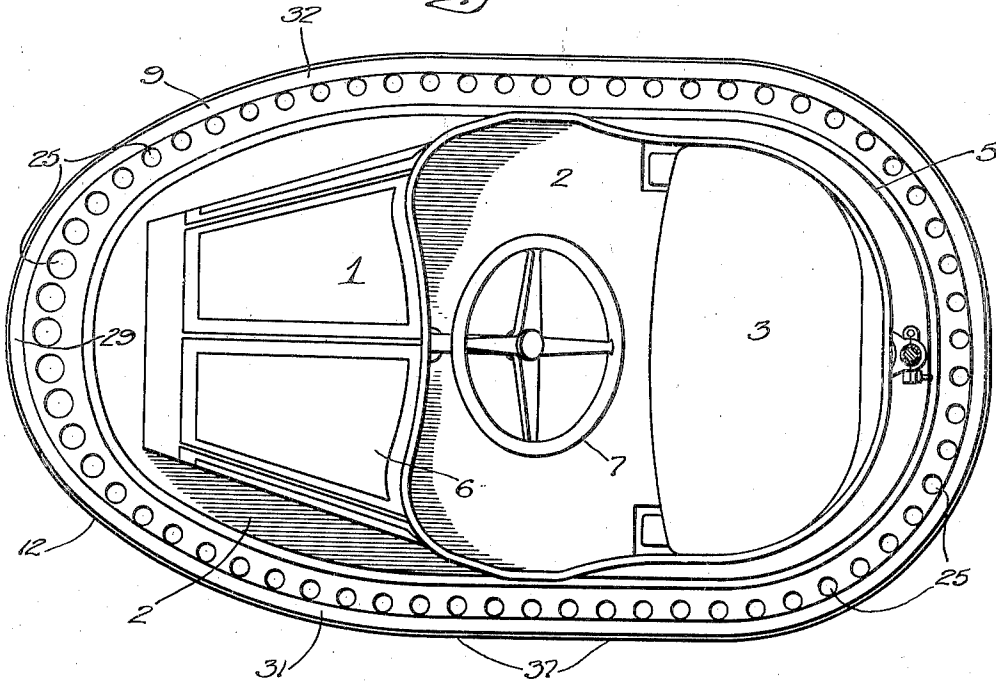
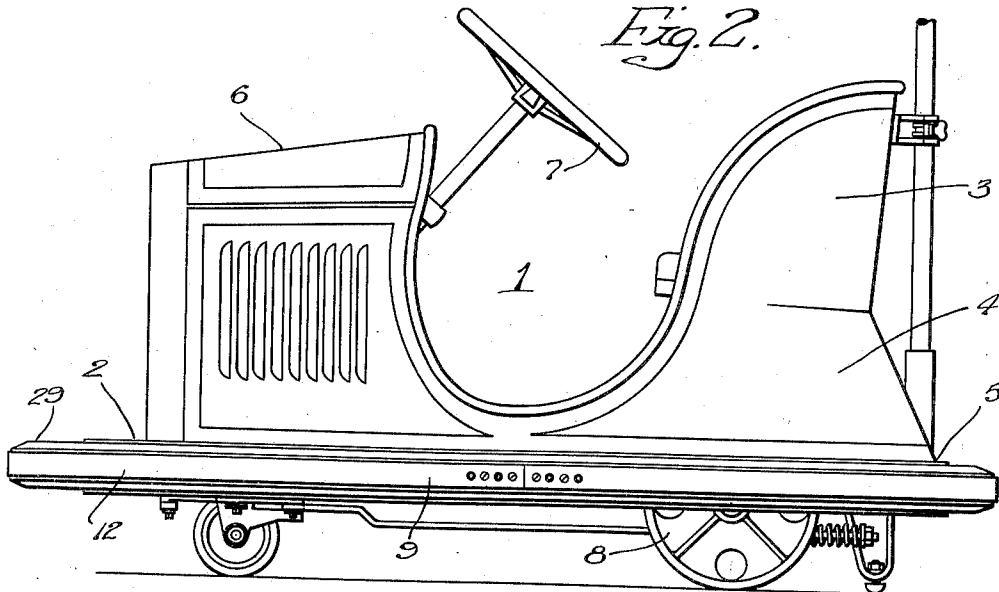


Fig. 2.



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Fig. 3.

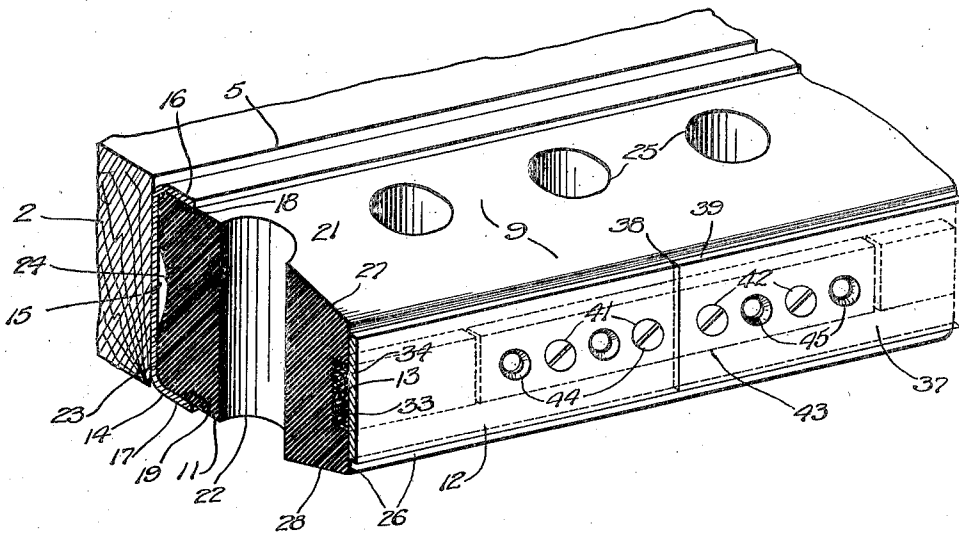


Fig. 5.

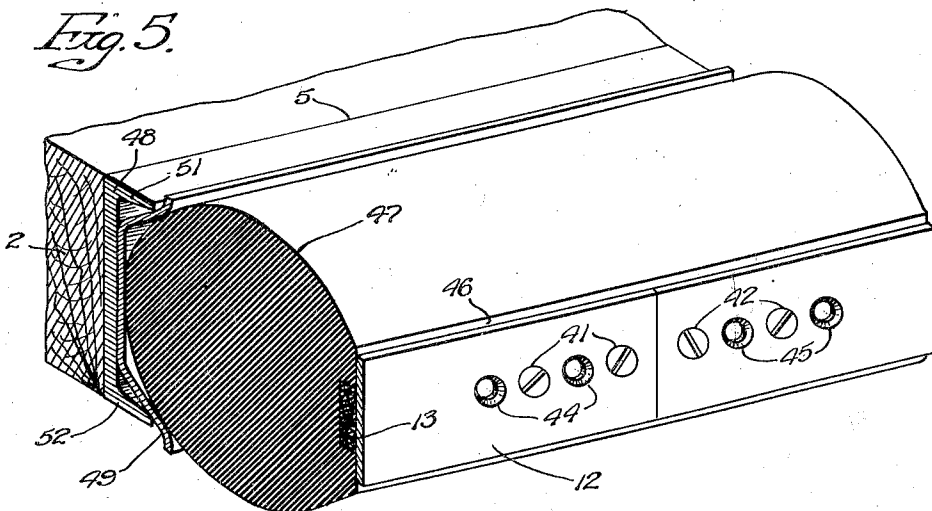
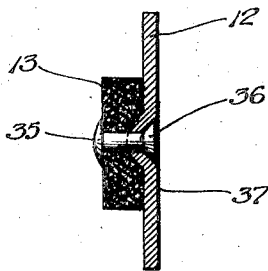


Fig. 4.



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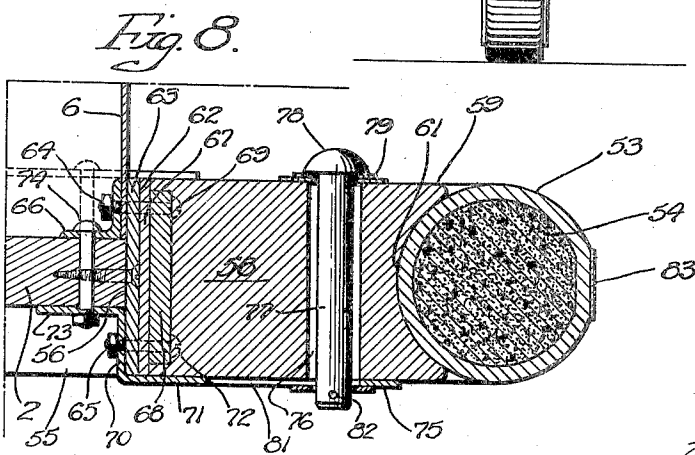
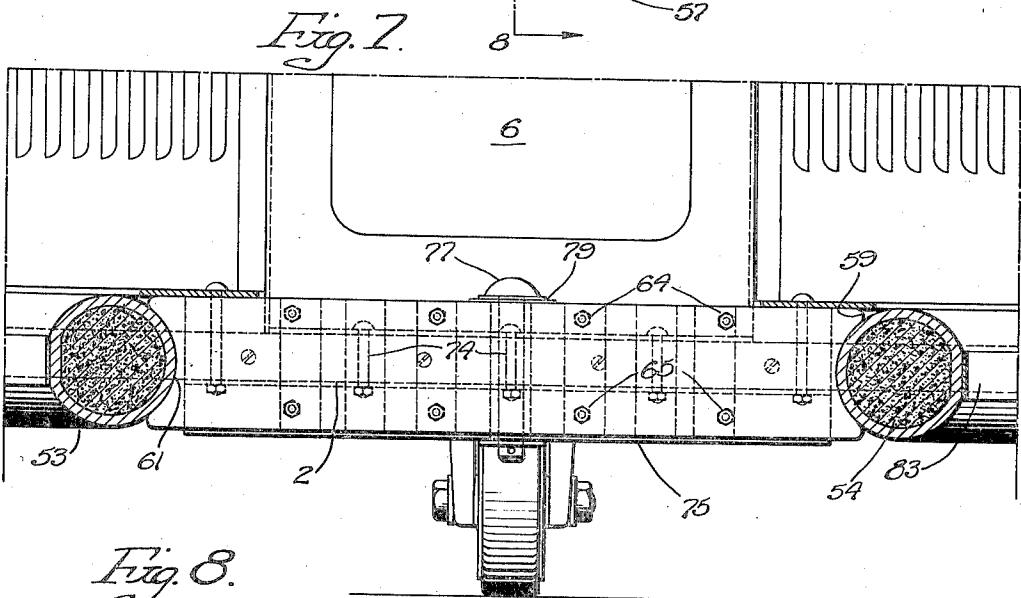
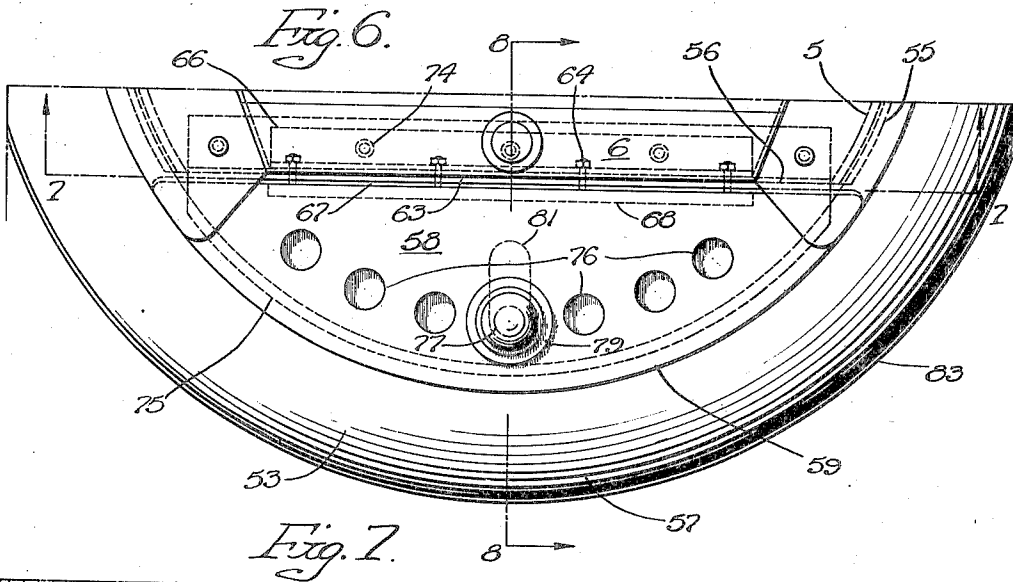
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Fig. 9.

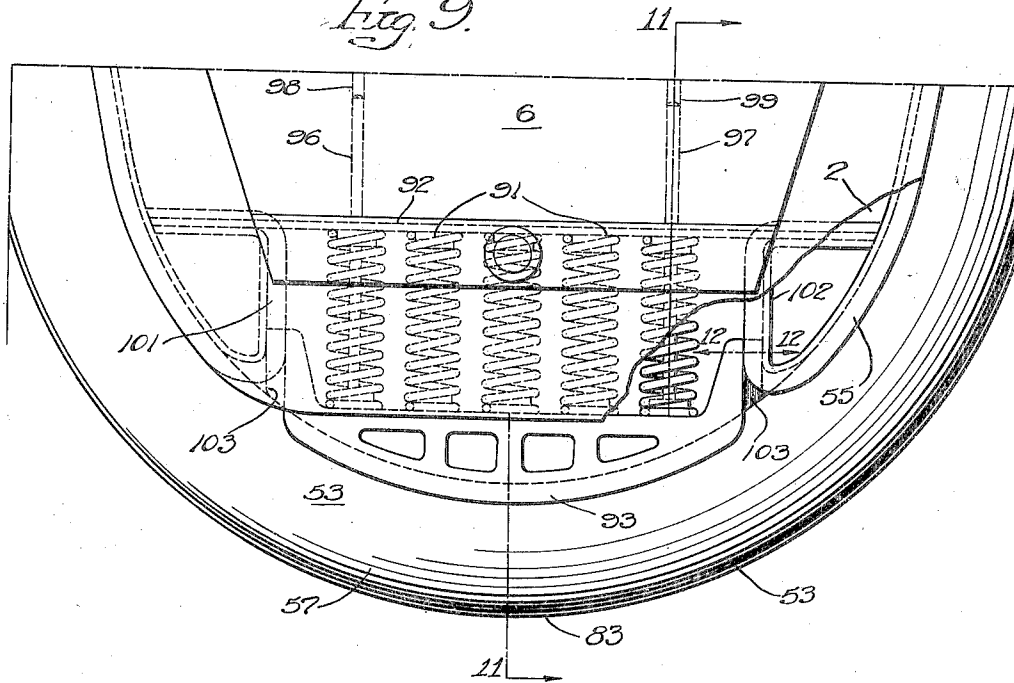
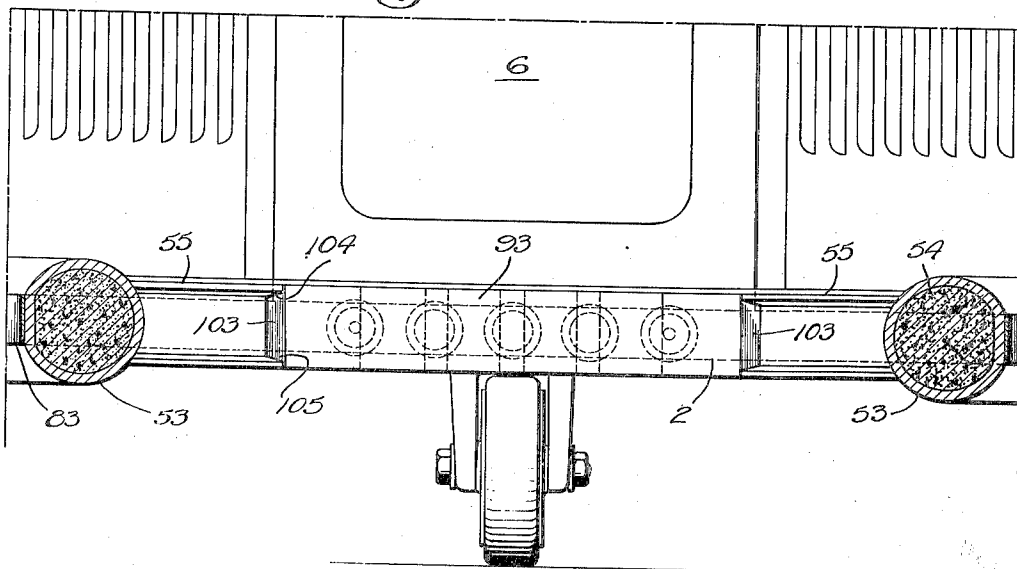


Fig. 10.



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Fig. 11.

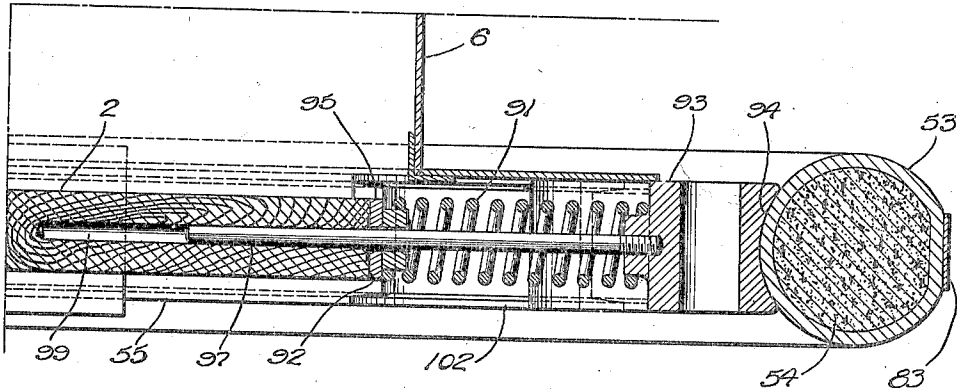


Fig. 12.

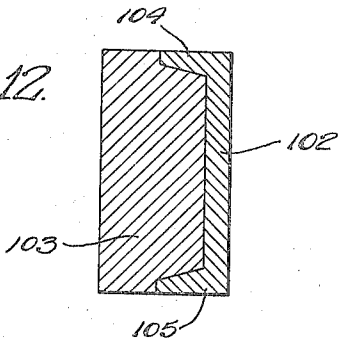
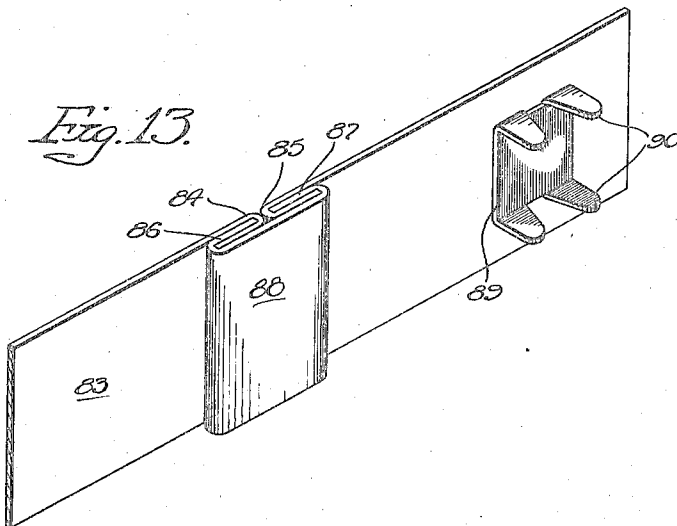


Fig. 13.



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UNITED STATES PATENT OFFICE

ROBERT JAKOB LUSSE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LUSSE BROTHERS, INC., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

AMUSEMENT-CAR CONSTRUCTION

Application filed September 25, 1928. Serial No. 308,264.

My invention relates to bumpers, and it has for one object the provision of a bumper that shall be particularly applicable to amusement cars of the type set forth in my co-pending application, Serial No. 122,634, filed July 15, 1926, and assigned to Lusse Bros., Inc.

Heretofore, it has been the practice to employ rubber bumpers on vehicles of the character aforesaid in order to reduce to a minimum the shock incident to the collision of two amusement vehicles. Experience has shown that the exposed abutting surface of such bumpers rapidly wears and becomes unsuitable for further use, so that frequent replacements are necessary.

Another object of my invention, therefore, is to provide a bumper which overcomes these difficulties, my invention contemplating the mounting of a flexible steel band on the exposed portion of the cushion member so as to afford a flexible metallic abutting surface. The flexible steel band permits the use of an exceedingly resilient grade of rubber in the cushioning member without the usual undesirable results of rapid wear and the tendency for abutting surfaces to adhere together.

A further object of my invention is to provide a bumper comprising an annular member of resilient material, the dimensions of one portion of which are increased to afford greater shock absorbing capacity.

A still further object of my invention is to provide a bumper of the character described, wherein a plurality of transverse apertures are provided in order to increase further the cushioning effect.

A still further object of my invention is to provide a bumper for amusement vehicles, wherein the cushion member is so designed as to prevent the overriding of one bumper by another upon the collision of two vehicles.

Other objects and applications of my invention, as well as details of construction and operation, whereby my invention may be practiced, will be apparent more fully hereinafter, when taken in connection with the accompanying drawings, wherein

Figs. 1 and 2 are top plan and side eleva-

tional views, respectively, of an amusement vehicle embodying my invention;

Fig. 3 is an enlarged detail view of one portion of the bumper and associated supporting structure;

Fig. 4 is an enlarged detail sectional view illustrating the flexible steel band and its associated flexible supporting member;

Fig. 5 is a view similar to Fig. 3, but showing an alternative embodiment of my invention;

Fig. 6 is a detail top plan view of the front end of an amusement vehicle, showing an alternative bumper construction;

Figs. 7 and 8 are transverse and longitudinal sectional views, respectively, taken on the lines 7-7 and 8-8 of Fig. 6;

Figs. 9, 10, and 11 are views similar to Figs. 6, 7 and 8, but showing another alternative embodiment of my invention;

Fig. 12 is a detail transverse sectional view taken on the line 12-12 of Fig. 9; and

Fig. 13 is a detail perspective view of the protective steel band shown in Figs. 8 and 11, illustrating the method of securing the ends of the band, and supporting the same on the cushion member.

Referring to Figs. 1, 2 and 3, an amusement vehicle 1 of the character disclosed in my aforesaid application, comprising a main horizontal platform 2; a seat 3; a supporting structure 4 for said seat 3, which extends upwardly from an outer edge 5 of the platform 2; a hood 6; a steering wheel 7; supporting and driving mechanism 8; and a shock-absorbing bumper 9 described hereinafter in greater detail.

The shock-absorbing bumper 9 comprises, in general, an annular rubber cushion member 11 of approximately rectangular cross-section; a protective flexible steel band 12; a flexible supporting member 13 of leather or like material for the steel band carried by the cushion member or tire 11; and a supporting channel member 14. The channel member 14 is provided with a vertical wall 15, which is bolted or otherwise secured to the adjacent outer edge 5 of the vehicle platform 2, and a pair of outwardly projecting spaced flanges 16 and 17. The flanges

16 and 17 respectively engage inner portions 18 and 19 of horizontal upper and lower sides 21 and 22 of the annular cushion member 11, and are of relatively narrow width so as to decrease to a minimum the restricted portion of the cushion member 11. An inner side 23 of the cushion member 11 engages the vertical wall 15 of the channel member 14, and it is provided with a circumferential recess 24 for the purpose of increasing the cushioning effect of the member 11.

In accordance with my invention, the cushioning effect of the tire member 11 is further increased by the provision of a plurality of transverse apertures 25 which extend through the member 11 from the upper side 21 thereof to the lower side 22 of the member 11 substantially midway between inner and outer sides 23 and 26 thereof. Outer portions 27 and 28 of the upper and lower sides 21 and 22 may be slightly beveled, as shown in Fig. 3.

Inasmuch as amusement apparatus of the present character is most frequently subject to head-on collisions, it is desirable to provide additional cushioning means at the front end of the vehicle. One method of accomplishing this result is shown in Fig. 1, wherein a front end portion 29 of the resilient tire 11 is of increased dimensions, the width thereof being gradually increased from the side portions 31 and 32 to a maximum at the longitudinal center-line of the vehicle. The increase in width is effected by a gradual increase in the outer diameter of the member 11 and a corresponding decrease in the inner diameter thereof. The diameter of the apertures 25 is also gradually increased from a minimum at the side portions 31 and 32 to a maximum at the extreme front end of the vehicle.

Heretofore, much annoyance has been occasioned by reason of the rapid deterioration of the abutting surface portions of the bumpers. It has been found that, in a very short time, the abutting surfaces of adjacent vehicles tend to stick together, causing the stalling of the vehicles and consequent dissatisfaction on the part of the riders. Moreover, the frequent replacement of the rubber bumpers materially increases the operating expenses of the vehicles. These undesirable results are entirely overcome in my invention by the provision of the protective flexible steel band 12 which encircles the resilient means 11 and is supported in engagement with the outer side 26 thereof by means of the flexible supporting member 13.

The flexible member 13 may be mounted on an inner side 33 of the steel band 12 and it fits a circumferentially extending recess 34 formed in the outer side 26 of the cushion member 11. The member 13 may be rigidly secured to the steel band 12 by rivets 35. In order to remove an outer head 36 of each rivet from an outer abutting surface 37 of the

steel band 12, a recess therefor is formed by indenting inwardly the band 12, as shown in Fig. 4. The formation of the recess for the rivet head 36 by indenting rather than by countersinking is preferable in view of the thinness of the flexible steel band 12.

As shown in Fig. 3, the adjacent ends 38 and 39 of the flexible steel band 12 are held in abutting relation by pairs of screws 41 and 42 which respectively engage tapped apertures in a block 43. The block 43 fits the recess 34 in the outer side 26 of the cushion member 11, and it is of sufficient length to overlap the joint formed by the meeting edges of the steel band end portions 38 and 39. The end portions 38 and 39 of the steel band 12 are provided with additional pairs of apertures 44 and 45, which are adapted to receive the pairs of screws 41 and 42, respectively, in the event that the dimensions of the car vary or the steel band 12 is slightly under its normal length.

Assuming, for example, that the vehicle 1 collides head-on with another vehicle (not shown), the steel band 12 and its flexible supporting member 13 are deflected inwardly. This movement, however, is resisted and absorbed by the cushioning effect of the tire member 11. Since the portion 29 of the member 11 at the front end of the vehicle and the perforations therein are of increased dimensions, maximum cushioning effect is obtained with a minimum jarring of the rider. When the two vehicles are disengaged, the steel band 12 acting under its own resiliency and that of the cushion member 11, immediately returns to its original position.

Should the collision represent merely the rubbing of one bumper against another, the smooth metallic abutting surfaces 37, afforded by the steel bands 12 of the two vehicles reduce to a minimum the frictional resistance therebetween, preventing the rapid deterioration of the cushion members 11 and also the actual stalling of the vehicles. Should it be necessary to replace the steel band 12 after a period of years, this may be readily done without removing or otherwise disturbing the rubber cushion member 11, so that the upkeep of the vehicle cushion member is still further reduced.

Fig. 5 is a view similar to Fig. 3, but illustrates the steel band 12 and the flexible supporting member 13 mounted on an outer flat side 46 of a rubber cushion member 47 of circular cross-section. The member 47 may be seated directly in a channel member 48 encircling the outer edge 5 of the platform 2, or it may be seated in a channel-shaped member 49 which is carried by the channel member 48 between upper and lower flanges 51 and 52 thereof.

Figs. 6, 7 and 8 illustrate an alternative embodiment of my invention, wherein an annular cushion member or tire 53 having a

core 54 of sponge rubber is seated in a channel member 55. The channel member 55 partially encircles the outer edge 5 of the vehicle platform 2, terminating at a front edge portion 56 of the platform 2. A front end portion 57 of the cushion member 53 is extended beyond the front edge portion 56 to provide an open space adapted to receive a cushioning block 58 having an arcuate front side 59 provided with a recess 61 constituting a seat for the adjacent side portion of the cushion member 53. A rear side 62 of the cushioning block 58 is held in abutting relation with a vertical cross plate 63, which is mounted on the front edge of the platform 2, by means of upper and lower series of bolts 64 and 65.

The upper series of bolts 64 pass through a supporting bracket 66, the hood 6, the plate 63, a portion 67 of the cushioning block 58 and a vertical plate 68 which is imbedded in the block 58, terminating in heads 69. The lower series of bolts 65 extend through a vertical flange portion 70 of a supporting bracket 71, the plate 63, the rubber portion 67 and the vertical plate 68, terminating in heads 72. The bracket member 71 is provided with an upper horizontal portion 73 which engages the underside of the platform 2 and is secured thereto by means of bolts 74 passing through the platform 2 and the upper supporting bracket 66. The bracket 71 is provided with a lower horizontal flange 75 projecting forwardly from the edge 56 of the platform 2 under the cushioning block 58 so as to provide a lower support for the same.

The cushioning member 58 is also provided with a plurality of apertures 76 which are positioned inwardly of the outer side 59 thereof, a central aperture receiving a bolt 77. An upper head 78 of the bolt 77 is mounted on washers 79 supported on the upper side of the cushioning block 58. The lower end portion of the bolt 77 extends through a longitudinal slot 81 in the lower flange 75 of the bracket member 71 and is secured in position by means of a pin 82.

The outer exposed side of the cushion member 53 may be protected by a flexible steel band or strip 83 corresponding to the steel band 12 of Fig. 3. Fig. 13 illustrates one method of interlocking adjacent end portions 84 and 85 of the band 83, wherein these end portions are bent backwardly to form recesses adapted to receive end portions 86 and 87, respectively, of a connecting plate 88. The steel band 83 may be secured in position by means of clips 89, of which only one is shown in Fig. 13, provided with fastening prongs 90.

The embodiment of my invention shown in Figs. 9 to 12, inclusive, distinguishes over that shown in Figs. 6 to 8 principally in the use of a plurality of cushion springs 91 between a front edge 92 of the platform 2 and

the front end portion 57 of the cushion member 53. The outer ends of the springs 91 abut against a casting 93 having a recess 94 constituting a seat for the adjacent portion of the resilient member 53. The inner ends of the springs 91 abut against a cross plate 95 which is secured to the front edge 92 of the platform 2. The casting 93 may be guided by rods 96 and 97 which extend rearwardly into guiding recesses 98 and 99 formed in the platform 2. The member 93 is further guided by spaced bent-back portions 101 and 102 of the channel member 55, the casting 93 having projecting portions 103 which fit between the upper and lower flanges 104 and 105 of the channel member 55 as shown in Figs. 9 and 12.

While I have shown several embodiments of my invention, for the purpose of describing the same and illustrating its principles of construction and operation, it is apparent that various changes and modifications may be made therein without departing from the spirit of my invention. I desire, therefore, that only such limitations shall be imposed thereon, as are indicated in the appended claims or as are demanded by the prior art.

I claim:

1. A bumper for vehicles, comprising cushion means, protective means for said cushion means affording an exposed abutting surface for said bumper, and means including a flexible element, whereby said protective means may be secured in operative relation to said cushion means.
2. A bumper for vehicles, comprising cushion means, a metallic protective band providing a vehicle-abutting surface, and flexible means secured to said band and carried by said cushion means, whereby said band may be secured in position.
3. A bumper for vehicles, comprising cushion means, a metallic protective band for said means adapted to provide an exposed abutting surface for said vehicle, and a flexible member for securing said band in operative relation to said cushion means.
4. A bumper for vehicles, comprising resilient means provided with a recess, a protective metallic band for said resilient means affording an exposed abutting surface for said bumper, and means secured to said band and positioned in said recess for securing said band in position.
5. A bumper for vehicles, comprising resilient means provided with an outer surface having a recess, a protective steel band for said surface affording a vehicle-abutting surface, and a flexible member positioned in said recess and secured to said steel band whereby the latter may be secured in position.
6. In a bumper for vehicles, a metallic strip affording an abutting surface, and means whereby the ends of said strip may be adjutably interconnected.

7. A bumper for vehicles comprising a resilient member, said member being provided with a plurality of apertures positioned to increase the cushioning effect of said member.
8. A bumper for vehicles, comprising an arcuate resilient member provided with a plurality of sides, a supporting member having a recess constituting a seat for said member, one of said sides having a circumferential recess adapted to receive locking means.
9. A bumper for vehicles comprising an annular member formed of resilient material, one portion of said member being of increased dimensions.
10. A bumper for vehicles, comprising an annular member provided with a plurality of apertures, one portion of said member being of increased dimensions, the apertures in said portion also being of increased dimensions.
11. In a vehicle adapted for use in amusement parks, a bumper of annular form comprising a resilient member provided with an enlarged portion adjacent to one end of the vehicle, and a protective steel band for said resilient member affording a vehicle-abutting surface.
12. A bumper, for vehicles, comprising a body of resilient material carried by and completely surrounding said vehicle, and a flexible metallic protective member on the outer surface of said body, affording an abutting surface for said resilient body.
13. A bumper, for vehicles, comprising a body of resilient material carried by and completely surrounding said vehicle, and a flexible metallic band on the outer surface of said resilient body, affording an abutting surface for said body and acting as a protective device therefor.
14. A bumper, for vehicles, comprising a body of resilient material carried by and completely surrounding said vehicle, a flexible metallic band on the outer surface of said resilient body, affording an abutting surface for said body and acting as a protective device therefor, and means for securing the said resilient band in position on said resilient body.

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