Dec. 13, 1949 T. F. BRENNAN 2,491,158

BUFFER FOR RAILWAY CARS

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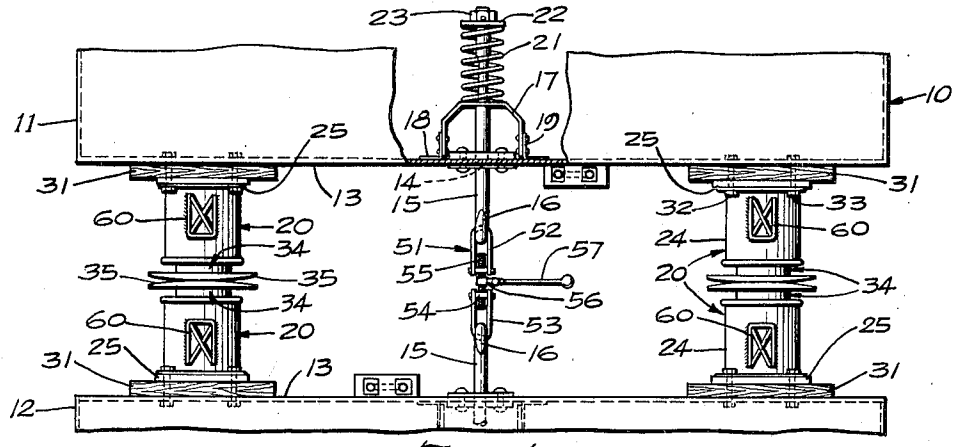

Fig. 1

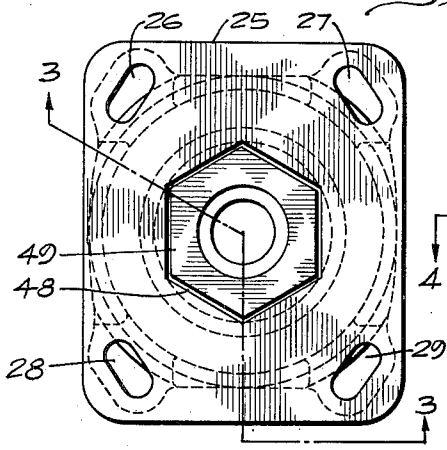

Fig. 2

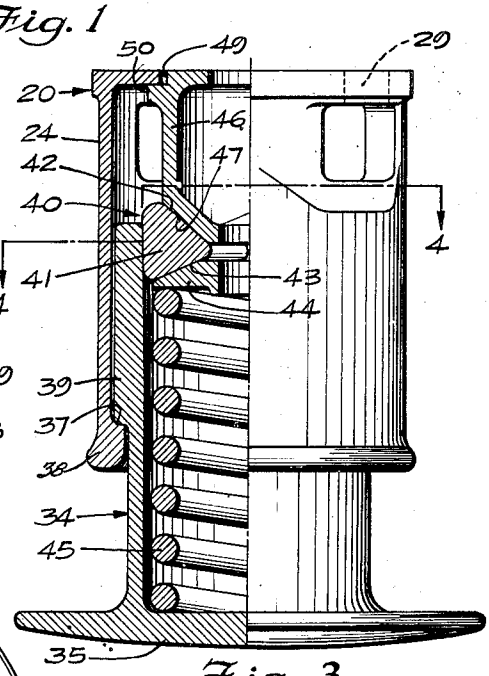

Fig. 3

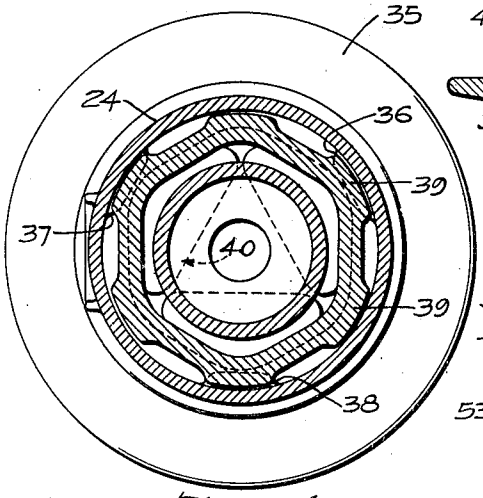

Fig. 4

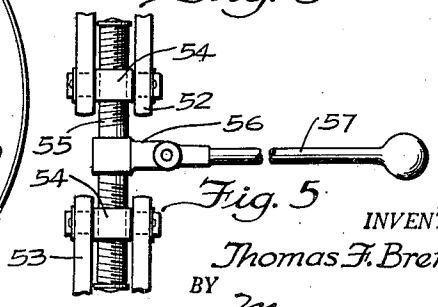

Fig. 5

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BUFFER FOR RAILWAY CARS

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10 Claims. (Cl. 213—221)

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This invention relates to railway cars, and more particularly to the connections between the cars.

One of the objects of the invention is the provision of new and improved connecting mechanism between railway cars so constructed that shocks due to buff will be efficiently absorbed by the buffer mechanism.

A further object of the invention is the provision of a new and improved buffer for use in railway cars.

A still further object of the invention is the provision of new and improved connecting mechanism between railway cars, comprising resilient means on adjoining cars normally engaging each other under initial compression.

A still further object of the invention is the provision of a new and improved buffer member for railway cars that is provided with friction mechanism for absorbing shocks due to buffing of the cars.

A still further object of the invention is the provision of new and improved buffer mechanism that is simple in construction, efficient in operation, easily assembled and applied, and that is not likely to become broken or get out of order.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawing, in which

Fig. 1 is a plan view of a portion of a railway train, shown more or less diagrammatically and with parts broken away, and showing the invention in position thereon;

Fig. 2 is an end elevation of one of the buffer members;

Fig. 3 is a section on the broken line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3; and

Fig. 5 is a top plan view of the connector member.

It is common practice, in the construction of railway cars, to provide a friction draft gear on the ends of the cars for absorbing shocks incident to both pull and buff. These devices operate in both directions, and consequently may not be employed with the type of car employing a single compression spring. The present invention seeks to provide a buffer mechanism separate and apart from the draft gear apparatus.

Referring now to the drawing, the reference character 10 designates a railway train having the cars 11 and 12. Each of the cars is provided with a front end sill 13, which may be in the form

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of a channel with the flanges extending toward the opposite end of the car, and each end sill is provided in its web portion with a central opening 14 in the longitudinal center line of the car and through which a draft bar 15 is adapted to extend. The draft bar 15 is provided on what will be termed its outer end with a coupler hook 16, and its inner end extends inwardly through a U-shaped bracket 17 rigidly secured to the end sill of the car by any suitable means, as the angle members 18 and 19, which are riveted to the forward end of the bracket 17 and to the web of the end sill 13, as shown more clearly in Fig. 1 of the drawing.

Since the draw bars and the means for mounting the same on the ends of the car are alike, only one will be described.

Each drawbar 15 extends inwardly through the end sill 13 and bracket 17, and beyond the same, and has a compression spring 21 mounted on its inner end. A spring seat in the form of a washer 22 is interposed between the inner end of the spring and a nut 23 threaded on the inner end of the drawbar for constituting an abutment for the spring.

The adjacent ends of the cars 11 and 12 are each provided with one or more bumper or buffer members 20. In the form of construction shown, two of these members are employed on each end of each car. Each buffer member includes what will be termed a barrel casing or chambered follower member 24 (see Fig. 3), which may be, and preferably is, cylindrical in cross-section at its outer portion and has a rectangular flange 25 extending about its inner end. The upper and lower portions of the flange, as shown in Fig. 2, are provided with bolt openings 26, 27, 28 and 29, and these openings are elongated and extend diagonally across the corners of the rectangular base for convenience in attachment. Interposed between the end sill and the base of the buffer members is a wooden block 31, and suitable fastening bolts 32 and 33 (Fig. 1) are provided for rigidly securing the block and buffer member to the end sill of the car, as clearly shown in Fig. 1 of the drawing.

Each buffer member 20 also includes a second chambered follower in the form of a plunger member 34. The plunger member 34 is hollow or chambered and has its inner end open and its outer end closed by a flanged end wall 35. The barrel member or body portion 24 and plunger member 34 telescopically engage each other, and suitable means are provided for holding them in assembled relation. As shown, the barrel mem-

ber 24 is hollow or chambered and is provided with a plurality of lugs 36, 37 and 38, three being shown, which extend radially inwardly from the inner surface of the wall of the body portion 24 at the outer end thereof, as shown more clearly in Fig. 4 of the drawing. The plunger is hexagonal in cross-section and is provided with a segmental flange forming lugs or segments 39 which extend radially outwardly from the corners of the plunger at the inner end thereof. These lugs, which are of material length as shown in Fig. 3, reinforce the walls of the plunger against bursting strains of the wedge mechanism when the buffer is compressed. The lugs 36, 37 and 38 are of such width that the plunger may be inserted in the barrel member 24 by turning the plunger to such position that the lugs 36 will pass between the segments 39. After they have been inserted the plunger is turned so that the lugs 36, 37 and 38 will be in front of the segments 39, thereby preventing separation of the members 24 and 34.

Suitable means are provided for developing frictional resistance to the compression of the buffer member 20. In the form of construction selected to illustrate one embodiment of the invention, spring means 45 and friction mechanism 40 are employed for frictionally resisting the compression of the buffer member 20. This friction mechanism 40 comprises a plurality of friction shoes 41, three being shown. The outer surface of the shoes conforms to the inner surface of the plunger member 34 at one of the corners, and is so constructed that each shoe will engage two sides of the inner hexagonal surface of the plunger. Each of the shoes 41 is provided with an inner inclined or wedging friction face 42 and an outer inclined or wedging friction face 43. Each of these inclined faces has plane surfaces, as indicated in Figs. 3 and 4. The outer inclined plane faces 43 of the wedges engage corresponding inner inclined plane wedge faces of a spring seat 44, as shown in Fig. 3. A spring 45 is seated against the outer end of the plunger, and presses against the outer face of the spring seat 44. Because of the inclined cooperating faces of the shoes and the spring seat the spring 45 tends to force the shoes outwardly into frictional contact with the inner surface of the plunger 34.

A suitable wedge 46, having three outer plane wedging faces 47, is provided for engaging the inner inclined faces 42, respectively, of the shoes 41 for forcing them radially outwardly into frictional engagement with the inner surface of the plunger 34 when the buffer is compressed. The inner end of the barrel member or body portion 24 is provided with an axially arranged angular or non-circular opening 48, and the wedge member 46 is provided with a corresponding reduced angular or non-circular projection 49 that engages in the opening 48, whereby the wedge 46 is prevented from turning relative to the barrel member 24. The wedge 46 and friction shoes 41 cooperate to prevent the rotation of the plunger 34 relative to the body portion or barrel 24. The reduced non-circular projection 49 forms a shoulder 50, which engages the end wall of the barrel member 24 for holding the wedge member 46 in position within said barrel member. In other words, the parts are locked against relative turning movement and the wedge 46 is prevented from passing out of the barrel 24 through the opening 48.

The barrels or body portions 24 of the buffer members 20 are each provided on their upper side with a step 60, which may be made integral with the barrel or be welder thereto, as shown in Fig. 1.

Suitable means are provided for placing the buffer members under initial compression when the cars are coupled together. In the form of construction shown, which is by way of example only, a coupler member 51 is employed for that purpose. The coupler member comprises a pair of clevises or U-shaped members 52, 53 (see Fig. 1), which are adapted to engage the coupler hooks 16 on the draw-bars 15 of the adjacent cars. The outer ends of the U-shaped member or clevises 52, 53, are each connected together by a cross-bar 54 which is pivoted therein. Each cross-bar is provided with a screw-threaded opening transversely through the same in the axis of the draw-bars, and a threaded connecting bar 55 is threaded in each of the bars 54. The bar 55 has its central portion provided with an outwardly extending projection 56, which may have a handle member 57 pivoted thereto. The bar 55 has its threads extending in opposite directions, so that when the handle or lever 57 is turned in one direction it will shorten the distance between the two clevises 52, 53, and when turned in the opposite direction will increase this distance.

In coupling the cars together the clevises 52, 53, are forced apart and are placed over the hooks 16, after which the lever or handle 57 is turned in a direction to force the coupler members 52 toward each other. In that way the buffer members on one car will be caused to engage the buffer members on the other car, thereby placing all of the springs in the buffers under initial compression.

In the operation of the device the springs 21 will cushion the shocks due to pull, and the shocks due to buff will be absorbed by the spring 45 and the friction mechanism 40. When the buffer members are released the springs 45 restore the parts to normal expanded position. It is not necessary that the buffer members be under initial compression. They may be spaced apart, but they operate more smoothly and there is little shock where they are placed under initial compression.

I claim as my invention:

1. A buffer, comprising a first hollow member non-cylindrical in interior configuration, a second hollow member substantially cylindrical in interior configuration, said first hollow member being telescoped within said second hollow member, said first hollow member having externally extending lugs, said second hollow member having internally extending lugs adapted to cooperate with said externally extending lugs to limit axial expansion when the two members are in normal operative position, said lugs being constructed and arranged to permit the two members to be separated when the two members are relatively rotated to release positions, a plurality of friction shoes in contact with the non-cylindrical interior of said first hollow member to frictionally resist telescopic contraction of the two members, wedge means fixed relative to said second hollow member, and spring means in compression between said first hollow member and said shoes to cooperate with said wedge means to urge said shoes radially outwardly, said wedge means having a non-circular wedging portion in contact with said shoes and said shoes conforming with the non-cylindrical configuration of said first member whereby relative rotation of the two members out of said normal positions is resisted by the force of said spring.

2. A buffer, comprising the combination as set forth in claim 1, in which said wedge member has a non-circular base portion and in which said second hollow member has a non-circular seat for said non-circular base portion to prevent relative rotation between the wedge member and the second hollow member.

3. A buffer comprising a first hollow member, a second hollow member substantially cylindrical in interior configuration, said first hollow member being telescoped within said second hollow member, said first hollow member having externally extending lugs, said second hollow member having internally extending lugs adapted to cooperate with said externally extending lugs to limit axial expansion when the two members are in normal operative position, said lugs being constructed and arranged to permit the two members to be separated when the two members are relatively rotated to release positions, said first hollow member having a non-cylindrical interior, a wedge member fixed relative to said second hollow member, said wedge member having a non-circular wedging portion, a spring seat having a wedging portion, spring means in compression between said spring seat and said first hollow member, and a plurality of friction shoes interposed between said wedge member and said spring seat to press radially outward against said first hollow member, said shoes having wedging surfaces conforming to the non-circular portion of said wedge means and having friction surfaces conforming to the non-circular interior of said first hollow member whereby the pressure of the spring means not only resists axial contraction of the two members but also resists relative rotation of the two members out of said normal positions.

4. A buffer comprising the combination set forth in claim 3, in which said spring seat has a non-circular wedging portion and in which said friction shoes have wedging faces conforming thereto whereby the spring seat is yieldingly prevented from rotation relative to said second hollow member and the frictional contact of the spring means with said spring seat on one hand and with said first hollow member on the other hand further tends to prevent relative rotation between the two hollow members.

5. A buffer comprising an outer hollow member having circumferentially spaced radial inward lugs, an inner hollow member telescoped into said outer hollow member, the interior of said inner hollow member forming in cross-section a polygon, a plurality of friction shoes inside said inner hollow member, each of said shoes being positioned to press outward against said inner hollow member at one of the vertices of said polygon, said inner hollow member having longitudinally extending radial outward lugs at said vertices to serve the purposes of making guiding contact with said outer hollow member, of coacting with said radial inward lugs to normally prevent separation of the two members and of reinforcing said inner hollow member against outward pressure by said shoes at said vertices, and means to yieldingly urge said friction shoes outwardly.

6. A buffer comprising an outer hollow member having circumferentially spaced radial inward lugs, an inner hollow member telescoped into said outer hollow member, the interior of said inner hollow member forming in cross-section a polygon, a plurality of friction shoes inside said inner hollow member, each shoe being positioned to press outward against said inner hollow member at one of the vertices of said polygon, said inner hollow member having longitudinally extending radial outward lugs at said vertices spaced circumferentially apart to clear said radial inward lugs for axial separation of the two hollow members when the two hollow members are relatively rotated out of normal positions to release positions, said radial outward lugs serving the purpose of making guiding contact with said outer hollow member, of coacting with said inward lugs to normally prevent separation of the two members and of reinforcing said inner hollow member against outward pressure by said shoes at said vertices, and means to yieldingly urge said friction shoes outwardly.

7. A buffer comprising a hollow member having an inner end adapted for attachment to one end of said car, a plurality of lugs extending radially inwardly on the outer end of said member, a hollow plunger member angularly in interior cross-section telescoped into said hollow body, said plunger member having inner side walls forming vertices of angles, said plunger member having lugs extending radially outward on its telescoped end at said vertices of angles for strengthening said inner side walls and for interlocking with said first-named lugs for holding said hollow member and said plunger member in assembled relation, friction shoes in at least some of said vertices of angles, each shoe frictionally engaging two adjacent inner walls of the plunger member, each of said shoes having an inner inclined plane face and an outer inclined plane face, a wedge member having plane wedging faces engaging said inner inclined faces, respectively, said wedge member having a non-circular inner end extending through a corresponding non-circular opening in the inner end of said hollow member for locking said hollow member and plunger against relative rotation, a spring seat having plane wedging faces engaging said outer inclined faces of said shoes, respectively, and spring means acting against said seat to urge said shoes radially outward.

8. A buffer comprising inner and outer chambered followers telescopically arranged, the inner follower being polygonal in cross-section and having radially extending lugs on the outer surface of its corners elongated lengthwise of the follower for strengthening the telescoped end of the follower against bursting strains, a plurality of lugs extending radially inwardly from the telescoped end of the outer follower, the lugs on said inner and outer followers being so spaced that they will slide past each other when turned out of alignment by relative rotation of the two followers out of normal positions of relative rotation during assembly and will lock the followers together when in normal alignment after assembly, and spring means and wedging mechanism constructed and arranged both for frictionally resisting telescopic contraction of the two followers and for yieldingly resisting relative rotation of the two followers out of normal alignment of said lugs.

9. A shock absorbing device comprising a casing having circumferentially spaced inwardly extending lugs, a plunger mounted in said casing and projecting therefrom, said plunger being capable of both rotation relative to the casing and longitudinal movement relative to the casing, said plunger having outwardly extending lugs for

engagement with said inwardly extending lugs at a normal position of rotation of the plunger relative to the casing for normally limiting the longitudinal movement of the plunger outwardly of the casing, said outwardly projecting lugs being spaced to permit passage thereof between said inwardly projecting lugs when the plunger is rotated out of said normal position of rotation, and spring-actuated friction means mounted within said plunger both urging said plunger longitudinally outward of the casing and tending to rotate the plunger to said normal position of rotation.

10. A shock absorbing device comprising a casing, a plunger mounted therein and projecting therefrom, said plunger being capable of longitudinal inward and outward movement relative to the casing, said casing and plunger being relatively rotatable into and out of interlocking positions for limiting longitudinal outward movement of the plunger relative to the casing, and spring-actuated friction means within said plunger both resisting said outward longitudinal movement and tending to cause relative rotation of the plunger and casing to said interlocking positions.

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