Aug. 31, 1948. G. E. DATH 2,448,138

CAR-END BUFFER

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Fig. 1.

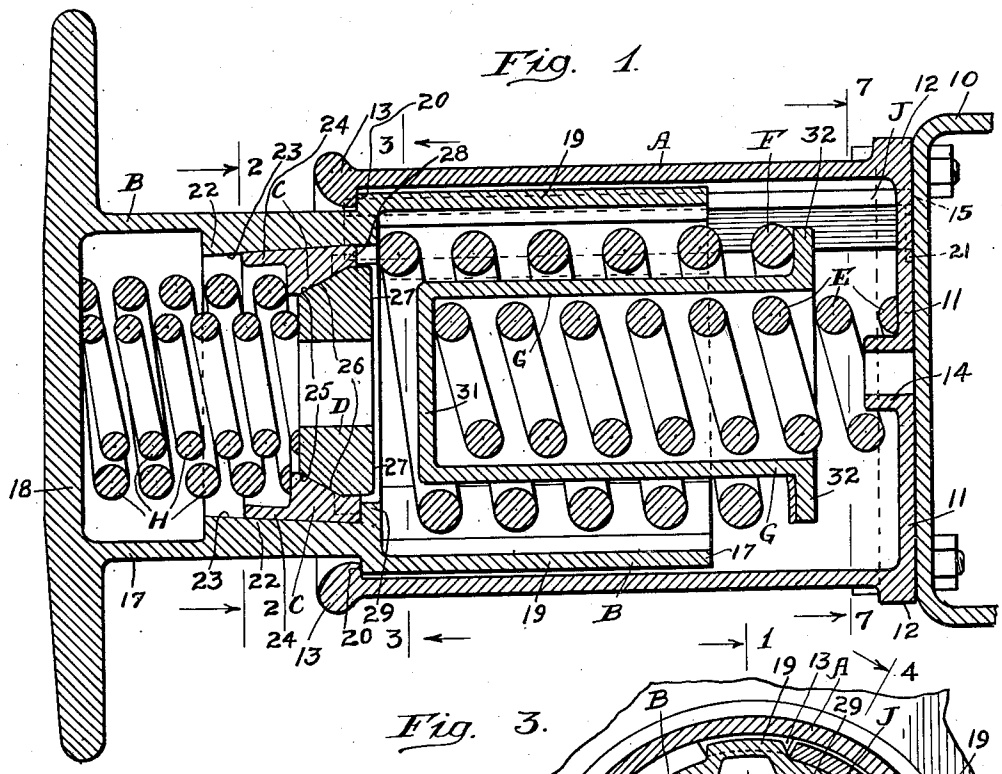


Fig. 3.

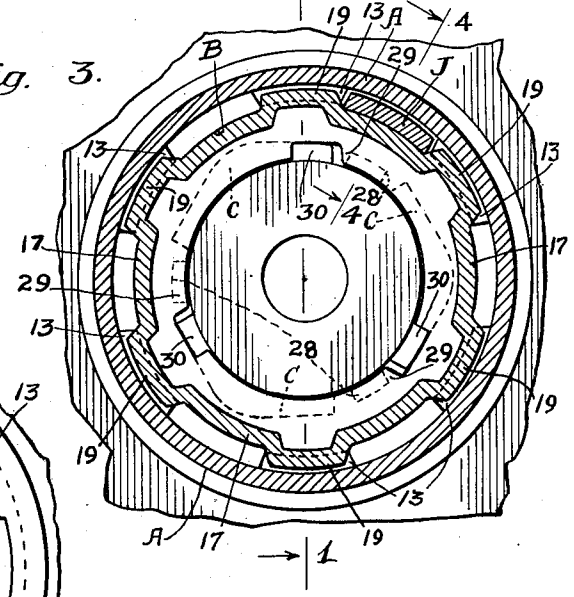
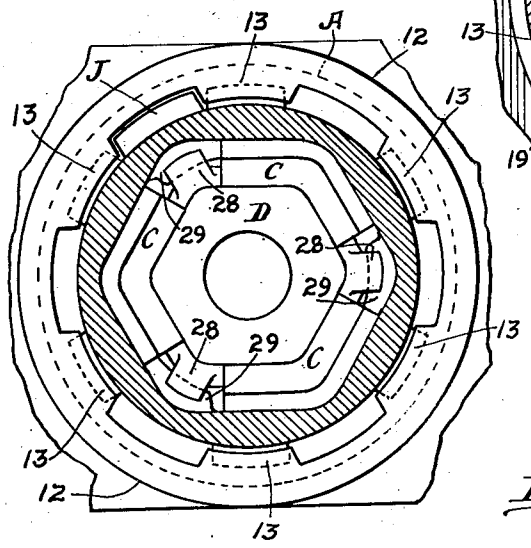


Fig. 2.



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Fig. 4.

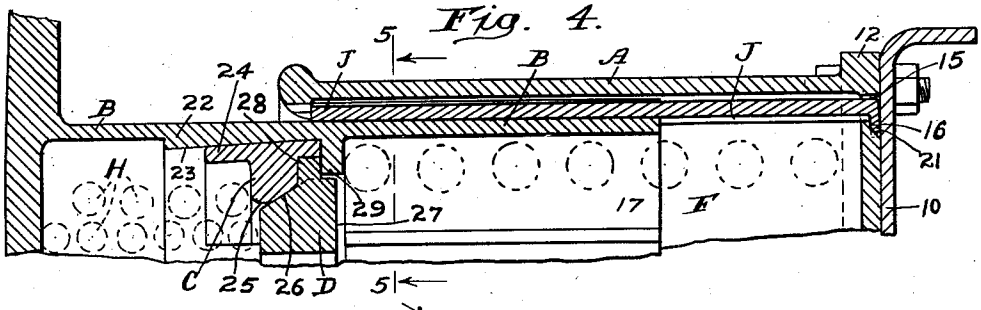


Fig. 5.

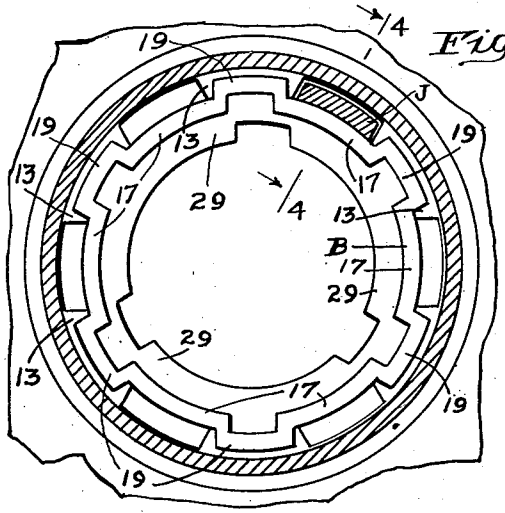


Fig. 6.

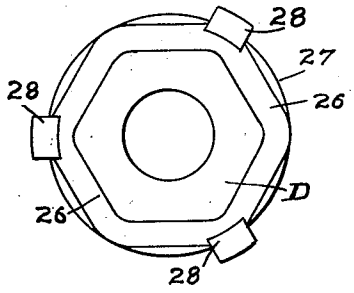
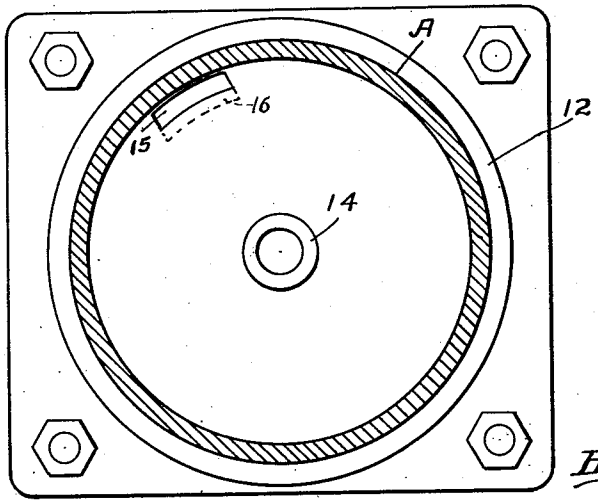


Fig. 7.



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CAR-END BUFFER

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Application March 23, 1945, Serial No. 584,407

4 Claims. (Cl. 213—221)

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This invention relates to improvements in car-end buffers for railway cars.

One object of the invention is to provide a buffer mechanism for railway cars having preliminary spring action to absorb the lighter buffing shocks followed by frictional resistance to take care of the heavier shocks, wherein the light preliminary spring action is effected by a plurality of springs which act in series, thereby providing efficient spring action of the mechanism.

A more specific object of the invention is to provide a buffer mechanism comprising a housing fixed to the end of the car; a combined buffer head and friction casing slidingly telescoped within the housing; a friction clutch slidingly telescoped within the combined buffer head and friction casing; a spring yieldingly opposing movement of the clutch inwardly of the combined buffer head and friction casing; and means yieldingly opposing movement of the combined buffer head and friction casing inwardly of the housing to provide initial spring action including a floating thimble, an outer spring reacting between the thimble and combined buffer head and casing, and an inner spring reacting between the thimble and the housing, wherein the thimble also functions as a pressure transmitting column element between the friction clutch and housing to produce sliding movement of the former and the combined buffer head and friction casing with respect to each other to provide high frictional resistance during the final compression of the device.

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

In the drawings forming a part of this specification, Figure 1 is a longitudinal, vertical sectional view of my improved buffer mechanism, illustrating the same mounted in position on the end of a railway car. Figures 2 and 3 are transverse, vertical sectional views, corresponding respectively to the lines 2—2 and 3—3 of Figure 1. Figure 4 is a view, similar to Figure 1, partly broken away, corresponding substantially to the line 4—4 of Figures 3 and 5, the pressure transmitting thimble being omitted and the springs being indicated in dotted lines. Figure 5 is a transverse, vertical sectional view, similar to Fig. 3, the friction clutch being omitted in this view. Figure 6 is a front elevational view of the wedge block of my improved mechanism, looking from left to right in Figure 1. Figure 7 is a transverse, vertical sectional view, corresponding substantially to the line 7—7 of Figure 1, the spring resistance and the locking key being omitted in this view.

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In said drawings, 10 indicates a portion of the end wall of a railway car, the portion illustrated being at one side of the longitudinal center line of the car and having my improved buffer mechanism mounted thereon. As will be understood, the buffer mechanism is duplicated at the other side of the end of the car and the two mechanisms cooperate in a well-known manner with a pair of similar buffer mechanisms on the end of an adjacent car.

My improved buffer mechanism comprises broadly a housing A; a combined buffer head and friction casing B; three friction shoes C—C—C; a wedge block D; inner and outer springs E and F; a spring follower thimble G; an additional spring resistance H; and a locking key J.

The housing A is in the form of a tubular shell closed at its rear end by a transverse vertical wall 11, which is extended laterally outwardly at opposite sides of the shell to provide securing flanges 12—12. The housing A, as shown, is of substantially cylindrical, transverse cross section and is provided with six equally spaced, inturned stop lugs 13—13 at the front end thereof, which is open. The rear wall of the housing A is provided with an inwardly projecting, central spring centering boss 14. At one side thereof, the rear wall 11 of the housing is provided with a transversely curved, slotlike opening 15 therethrough. The opening 15, as shown, is located close to the side wall of the housing and is in longitudinal alignment with the space provided between two adjacent lugs 13—13 of the housing, as will be clear upon reference to Figures 4, 5, and 7. The opening or slot 15 is countersunk at one side, as shown in Figure 4, to provide a seat 16 for the flange of the key J, as hereinafter described.

The combined buffer head and friction casing B comprises a cylindrical casing section 17, which is closed at the front end by a transverse wall 18, which extends laterally outwardly of the head on all sides thereof, thereby providing the buffer head proper. The casing 17 is telescoped within the housing A and has lengthwise sliding movement therein. At the rear end, that is, the open end of the casing 17, the same is provided with longitudinally extending, radially outwardly offset sections 19—19, providing shoulders 20—20 forming retaining lugs. The offset sections 19 and the lugs 20 are six in number and the latter cooperate with the six in-

turned stop lugs 13—13 of the housing A. The lugs 20 are of such a width that they will pass freely through the space between adjacent of the inturned stop lugs 13—13 to facilitate assembling of the housing A and the combined buffer head and friction casing B, the shoulders of the buffer head being brought into alignment with the shoulders of the housing by giving the buffer head a slight turn with respect to the housing. The offset sections or portions 19—19 of the casing 17 fit the interior of the cylindrical wall of the housing A and form guide members which prevent tilting or drooping of the buffer head. The offset sections 19—19 are of substantially the same width as the lugs 20. The combined buffer head and friction casing B is locked against rotation with respect to the housing A by the key J, which is in the form of an elongated, transversely curved plate having its rear end engaged through the opening 15 of the wall 11 of the housing A, its front end engaged in the corresponding opening between two adjacent lugs 13—13 of said housing, and its intermediate portion seated between the corresponding offset sections 19—19 of the casing 17 of the buffer head. To anchor the key J, the latter is provided with a short, right angular flange 21 at its rear end engaged in the seat 16, as shown in Figure 4.

The side wall of the casing 17 is interiorly thickened, as indicated at 22, forwardly of the offset sections 19—19. The thickened portion 22 of the casing is of hexagonal, interior cross section and presents three forwardly converging friction surfaces 23—23—23 of V-shaped, transverse cross section, the adjacent hexagonal side walls of the casing forming the V-shaped friction surfaces.

The friction shoes C are three in number and have outer, longitudinally extending friction surfaces 24—24—24, each surface being of V-shaped, transverse cross section and engaging respectively with the corresponding V-shaped friction surface 23 of the casing 17. On the inner side, each shoe presents a V-shaped wedge face 25, the wedge faces 25—25—25 of the three shoes converging inwardly or forwardly of the casing 17.

The wedge D is in the form of a block of hexagonal, transverse cross section, having three forwardly converging wedge faces 26—26—26 of V-shaped, transverse cross section, arranged symmetrically about the central longitudinal axis of the mechanism and respectively engaging the V-shaped wedge faces 25—25—25 of the three shoes C—C—C. The wedge has a transverse rear abutment face 27, which is substantially flat and cooperates with the front end of the spring follower thimble G, as hereinafter pointed out. To hold the wedge D assembled with the casing 17, three lugs 28—28—28 are provided on the wedge which project laterally outwardly or radially therefrom and engage in back of an inturned, annular flange 29 at the open inner end of the casing 17. The flange 29 is provided with three circumferentially spaced notches or openings 30—30—30 through which the lugs 28—28—28 of the wedge D may pass in assembling the wedge with the casing. The lugs 28 extend between adjacent friction shoes, thereby locking the wedge and the shoes against relative rotation with respect to each other about the central longitudinal axis of the casing. In this connection, it is pointed out that the V-shaped, interengaging formation of the friction surfaces of the friction shoes C—C—C and the casing 17 prevent relative rotation of the shoes with respect to the casing.

The spring follower thimble G is in the form of a cylindrical sleeve open at its rear end and closed at its front end by a transverse wall 31. The spring follower thimble G forms a column element to transmit the pressure from the wedge block D to the casing A, as hereinafter more fully described. At the rear end, the thimble G is provided with a laterally outwardly projecting, annular flange 32 which acts as an abutment for the outer coil spring F.

The spring F is in the form of a helical coil surrounding the thimble G and having its front and rear ends bearing respectively on the flange 29 of the casing 17 of the buffer head B and the flange 32 of the thimble. The spring E is also in the form of a helical coil of smaller diameter than the spring F and is seated within the thimble G against the transverse wall 31 thereof. The rear end of the spring E bears on the rear wall 14 of the housing A and is centered by the boss 14 which engages within said spring. The parts are so proportioned and the springs F and E are of such a capacity that the thimble G is normally held in the position shown in Figure 1, that is, with the front and rear ends thereof spaced from the inner end of the wedge D and the inner side of the rear wall 11 of the housing A, respectively.

The spring resistance H is disposed within the friction casing 17 and comprises inner and outer, helical coils which bear at their front ends on the transverse wall 18 of the buffer head. The inner spring bears at its rear end on the wedge D and the outer spring bears at its rear end on the shoes C—C—C, which are provided with transverse shoulders for this purpose.

In assembling the mechanism, the spring resistance H and the shoes C—C—C are first placed within the casing 17 of the buffer head B and the shoes forced inwardly to an extent to clear the inner side of the flange 29 of the casing 17, the shoes being forced inwardly to such an extent that the lugs 28 of the wedge will pass freely between the outer ends of the shoes and the inner face of the flange 29. The wedge D is then inserted within the casing 17 and moved inwardly to an extent to bring the lugs 28 thereof inwardly of the flange 29 of the casing. As will be understood, the lugs of the wedge are positioned to pass through the openings 30—30—30 of the flange 29 of the casing during this operation. The wedge is then given a partial turn to bring the lugs thereof into position to engage the flange 29 of the casing and the pressure is removed from the shoes to permit the spring H to expand and force the shoes outwardly into engagement with the wedge D with the lugs 28 of the wedge disposed between adjacent shoes. As will be evident, outward movement of the wedge is limited by engagement of the lugs thereof with the flange 29 of the casing. The spring E with the thimble G engaged thereover and the spring F surrounding the thimble and seated on the flange 32 thereof, are placed within the housing A and the housing is telescoped over the inner end of the casing 17. While the housing A is being applied to the casing 17 of the buffer head, the former is turned to a position that the lugs 13 thereof will pass between the lugs 20 of the offset sections 19—19 of the casing. After the lugs 13 have been brought to a position forwardly of the lugs 20, the housing A is given a partial turn with respect to the casing 17 to bring the lugs of the former in longitudinal alignment with the lugs of the latter.

The operation of my improved buffer mechanism is as follows: Upon inward movement of the buffer head B through pressure exerted thereon by any object, such as a buffer head of an adjacent car, the head B is forced inwardly of the housing A, compressing the springs F and E cumulatively through the medium of the pressure transmitting column follower thimble G. Upon compression of the springs F and E to a predetermined extent, the thimble G is engaged by the wedge block D and pressed against the rear wall 11 of the casing A. As the mechanism is further compressed, the casing 17 of the combined buffer head and friction casing B will be forced inwardly with respect to the wedge, which is held stationary by the thimble G, thereby setting up a wedging action between the wedge block D and the friction shoes C—C—C while the latter are slid inwardly along the friction surfaces of the casing against the resistance of the spring H, thus producing high frictional resistance during the remainder of the compression stroke. When the actuating force or pressure is removed from the buffer head B, the springs E, F, and H return all of the parts to the normal full release position shown in Figure 1, the springs E and F returning the buffer head and the thimble G to their normal positions and the spring resistance H returning the friction shoes and wedge to their full release positions, the wedge being limited in its outward movement with respect to the casing 17 by shouldered engagement therewith, and, in turn, limiting outward movement of the shoes. As will be evident, outward movement of the buffer head is positively limited by shouldered engagement of the lugs 20 thereof with the lugs 13 of the housing A.

I claim:

1. In a buffer for railway cars, the combination with a housing adapted to be secured to the end of a car; of a buffer head including a friction casing, said casing being slidingly telescoped within the housing; a friction clutch slidable within said friction casing, said clutch including a pressure transmitting wedge block and friction shoes; means within said casing yieldingly opposing inward movement of the clutch; and means yieldingly opposing inward movement of the buffer head including springs reacting respectively between the buffer head and housing, and a pressure transmitting column member interposed between said springs and transmitting the pressure from one spring to the other, said column member reacting between the housing and wedge block after a predetermined compression of said springs to slide the clutch inwardly of the casing.

2. In a buffer for railway cars, the combination with a housing adapted to be secured to the end of a car; of a buffer head including a friction casing, said casing being slidingly telescoped within the housing; a friction clutch slidable within said friction casing, said clutch including a pressure transmitting wedge block and friction shoes; means within said casing yieldingly opposing inward movement of the clutch; a floating pressure transmitting follower within said housing; a spring yieldingly resisting relative movement of the housing and follower toward each other; and a second spring yieldingly resisting relative movement of the buffer head and follower toward each other, said follower engaging the wedge and housing upon compression of the mechanism to a predetermined extent to transmit the actuating force to move said clutch inwardly of the casing.

3. In a buffer for railway cars, the combination with a housing adapted to be secured to the end of a car; of a buffer head including a friction casing, said casing being slidingly telescoped within the housing; a friction clutch slidable within said friction casing, said clutch including a pressure transmitting wedge block and friction shoes; means within said casing yieldingly opposing inward movement of the clutch; a pressure transmitting, hollow column element for transmitting the actuating force from the wedge to said housing upon compression of the mechanism to a predetermined extent, said element having a follower flange at one end thereof; a spring surrounding said column element and opposing relative movement of the buffer head and column element toward each other, said spring surrounding said element and having its opposite ends bearing on said buffer head and the follower flange of said element; and a second spring opposing relative movement of the column element and housing toward each other, said second spring being seated in said column element at one end and bearing at its other end on the housing.

4. In a buffer for railway cars, the combination with a housing adapted to be secured to the end of a car; of a buffer head telescoped within the housing for sliding movement, said head being open at its inner end and closed by a transverse wall at its outer end, said head having interior friction surfaces at said open end; a friction clutch slidingly telescoped within the open end of said head, said clutch including a pressure transmitting wedge block and friction shoes slidingly engaged with said friction surfaces; a spring within said head bearing at its outer end on the transverse wall of said head, and at its inner end on the shoes; a pressure transmitting hollow column element normally spaced from said wedge and engageable therewith after a predetermined compression of the mechanism for transmitting the actuating force from the wedge to said housing, said element being open at its rear end and closed by a transverse wall at its front end, said element having an exterior follower flange at its open end; a second spring surrounding said element and opposing relative movement of the buffer head and column element, said second spring bearing at one end on said flange and at the other end on said buffer head; and a third spring opposing relative movement of the column element and housing toward each other, said third spring being buttressed at its opposite ends against said housing and the transverse wall of said column element.

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