Feb. 20, 1940. E. R. SCHROEDER 2,190,737

CUSHIONED BUFFER AND COUPLING DEVICE

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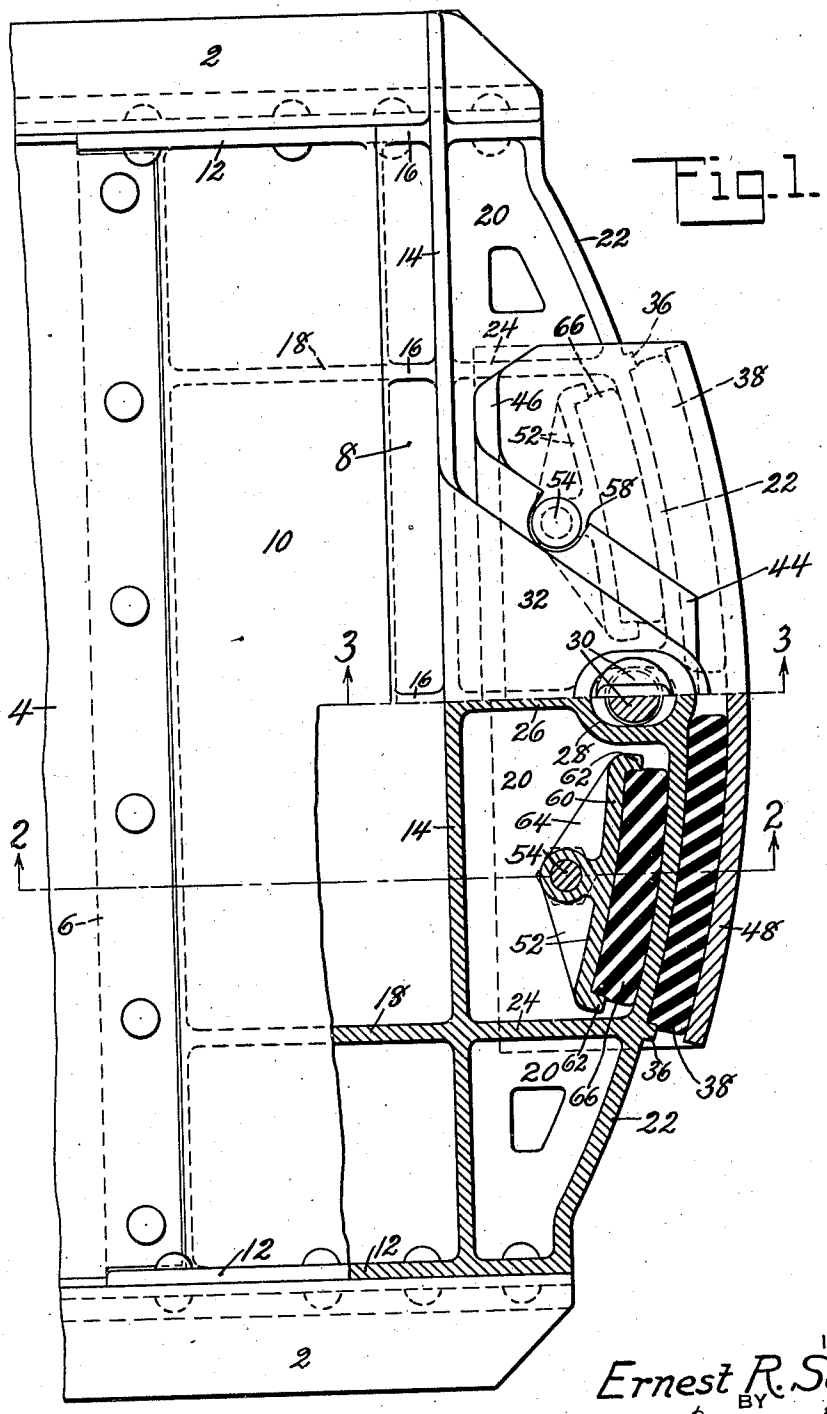



Fig. 1.

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Fig. 3.

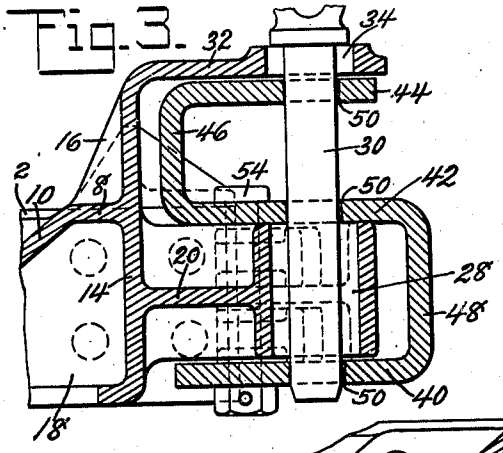
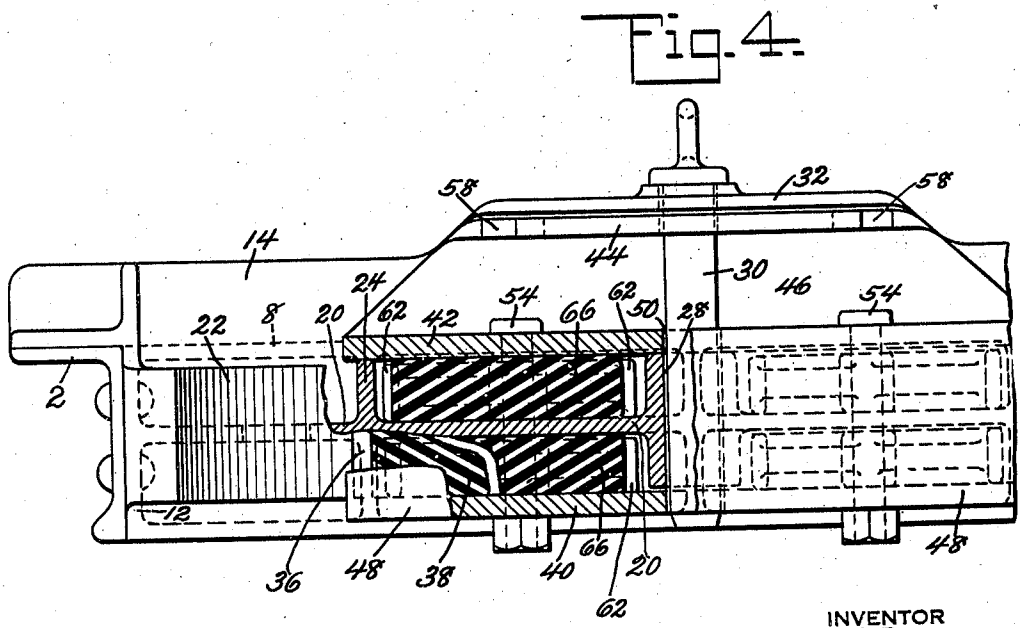



Fig. 2.




Fig. 4.




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## CUSHIONED BUFFER AND COUPLING DEVICE

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13 Claims. (Cl. 213—9)

This invention relates to buffer and coupling devices in general and in particular to such devices for use on mine or other industrial cars. In the past mine and industrial cars have been provided with wood blocks which cushioned the buffing strains, while the draft strains were uncushioned in most cases. Lately a considerable number of mine and industrial cars have been equipped with bumpers and couplers which are cushioned by means of coil springs, but these springs are found to take a considerable set during service, thus permitting loose play and excessive wear of the parts. It is an object, therefore, of this invention to provide a cushioned buffer and coupling device in which a non-metallic cushioning material is used, such as rubber, which will not take a permanent set.

A further object of the invention is the provision of a cushioned buffer and coupling device in which non-metallic cushioning material is used, thus permitting a more compact device than is possible with coil or other springs.

A still further object of the invention is the provision of a new and improved end construction for use with non-metallic cushioning units between the combined buffer and coupling element.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which:

Figure 1 is a plan view of the improved end construction with portions broken away to more clearly disclose the construction;

Fig. 2 is a sectional view taken substantially on line 2—2 of Fig. 1 and showing the relation of the cushioning blocks to the head of the end member;

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 1, and

Fig. 4 is an end view with portions broken away to more clearly disclose the position of the parts.

Referring now to the drawings in detail, it will be seen that the end member is formed as a single casting with its ends rigidly secured to inverted bulb angle side sills 2 and one of its sides to the intermediate floor 4. The rear floor supporting portion 6 of the end member is joined to an upper horizontal portion 8 by means of inclined portion 10, all of which extend continuously between the end side sill securing flanges 12. The upper horizontal portion 8 merges with a vertically extending wall 14 extending above and below the horizontal portion and suitably braced by gussets 16 and intermediate bracing ribs 18, the latter being of triangular shape and connected to the inclined portion 10 previously referred to. The front portion of the end member is substantially T-shape in cross section and is formed by web 20 projecting outwardly from the vertical wall and terminating in vertically extending flanges 22 which are curved the proper amount to provide clearance between the car ends. The web and flanges or head of the T-shaped projection are suitably braced by means of side ribs 24 substantially in alignment with the bracing ribs 18 and by a centrally disposed rib 26, the forward part of which is enlarged and pierced as at 28 to slidably receive a coupling pin 30. The upper central portion of the vertical wall 14 is extended outwardly as at 32 in spaced relation to the T-shaped projection and is formed at its forward edge with a slotted opening 34 likewise adapted to slidably receive the coupling pin.

The curved outer surface of the curved T-projection is formed with slight projections 36 adapted to retain non-metallic cushioning elements 38 in position between the T head and the inner surface of the buffer and coupling element. In the instance shown the combined buffer and coupling element is formed by pressing a single piece of metal to provide lower, intermediate and upper substantially horizontally spaced apart portions 40, 42 and 44 respectively joined together by spaced apart substantially vertical inner and outer portions 46 and 48 respectively, the latter of which is curved to provide a buffing face. It is thus seen that the combined buffing and coupling element is substantially S-shaped in cross section with the lower portion providing the buffer and opening rearwardly, while the upper portion, which opens outwardly, provides space for the reception of a coupling link (not shown), which would be held in place by the coupling pin extending through openings 50 in each of the horizontal portions of the element.

In order to cushion draft forces and retain the buffer and coupling element in position a plurality of sliding shoes 52 are provided pivotally mounted upon vertically extending pins or bolts 54 which extend through horizontal portions 40 and 42 respectively and through slots 56 formed in the web of the T-shaped projection. As clearly shown in Fig. 1 a portion of the upper horizontal flange of the buffer and coupling element is cut away as at 58 in order

that the bolts or pins may be dropped into their proper position as shown in Fig. 2. The sliding shoes previously referred to are formed with a curved outer face 60 terminating in outwardly directed flanges 62 and suitably braced by ribs or gussets 64. Non-metallic cushioning blocks 66 are positioned between the retaining flanges 62 and have their inner surfaces abutting the sliding shoes, while their outer surfaces abut the inner surface of the T-head. It is thus seen that in the present instance two blocks of cushioning material are used to cushion buffer surfaces, while four blocks are used to cushion draft forces; that is, two are positioned at either side of the center plane, with one located above and one below the web of the T-shaped projection.

The improved device just described may be readily assembled merely by sliding the shoes and draft receiving blocks into position with the buffer and coupling element held in an outer position, after which the element will be shifted inwardly a slight amount and the buffer receiving blocks slid endwise into position and the element pushed to its final location, after which the pins or bolts 54 may be inserted and the device is ready for use. Any buffing forces applied to the bumper will be absorbed by the non-metallic cushioning elements 38, while draft forces applied to the coupling pin will be imparted by the bolt and shoes to the non-metallic cushioning blocks 66 as is obvious.

While the device has been described more or less in detail, it is obvious that various modifications and rearrangements of parts will be apparent to persons skilled in the art and all such modifications and rearrangements of parts are contemplated as fall within the scope of the following claims.

What is claimed is:

1. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion connected to and projecting from the main portion of the end member and having the head spaced outwardly thereof, a buffer and coupling element carried by the end member, and resilient cushioning units cooperating with the element and with both the inner and outer surfaces of the head of the T portion for yieldingly resisting movements of the element relative to the member, certain of said units being pivotally connected to said element thereby equalizing the strains on said certain units during certain movements of said element.

2. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion connected to and projecting from the main portion of the end member and having the head spaced outwardly thereof, an S-shaped buffer and coupling element carried by the end member, and resilient cushioning units cooperating with the lower portion of the element and with both the inner and the outer surfaces of the head of the T-portion for yieldingly resisting relative movements of the element and member, certain of said units being pivotally connected to said element thereby equalizing the strains on said certain units during certain movements of said element.

3. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion connected to and projecting from the main portion of the end member and having the head spaced outwardly thereof, an S-shaped buffer and coupling element carried by the end member, coupling means extending across the upper portion of the element, and resilient cushioning units cooperating with the lower portion of the element and with both the inner and the outer surfaces of the head of the T-portion for yieldingly resisting relative movements of the element and member under buffing or coupling strains and for transferring such strains through the T-shaped portion to the end member.

4. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion projecting from the main portion of the end member and having the head spaced outwardly thereof, a combined buffer and coupling element carried by the end member, resilient cushioning units engaging the element and outer head surface of the T-portion for yieldingly resisting inward movement of the element under buffing strains, and additional resilient cushioning units engaging the inner head surfaces of the T-portion and secured to said element for yieldingly resisting outward movement of the element under draft strains, said units transferring said strains directly to the end member through said T-shaped portion.

5. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion connected to and projecting from the main portion of the end member and having the head spaced outwardly thereof, a combined buffer and coupling element carried by the end member, cushioning units engaging the element and outer head surface of the T-portion for yieldingly resisting inward movement of the element, and additional cushioning units located on either side of the web of the T-shaped portion and engaging the inner head surfaces for yieldingly resisting outward movement of the element, certain of said units being pivotally connected to said buffer and coupling element thereby equalizing the strains on said certain units during movement of said buffer and coupling element.

6. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T-shaped portion projecting from the main portion of the end member and having the head spaced outwardly therefrom, a combined buffer and coupling element carried by the end member, cushioning units engaging the element and outer head surface of the T portion for yieldingly resisting inward movement of the element, and additional cushioning units located on either side of the web of the T shaped portion and engaging the inner head surfaces for yieldingly resisting outward movement of the element, said additional units being pivotally connected to said element thereby equalizing the strains on said additional cushioning units.

7. A cushioned draft device for mine cars comprising in combination with a car end member, a T-shaped portion projecting from the main portion of the end member and having the head spaced outwardly thereof, a draft element carried by the end member, and rubber cushioning units engaging the inner surfaces of the T-head and operatively connected to the draft element to yieldingly resist draft forces applied to the draft element, said connection permitting rock-

ing of the units to thereby equalize the strains on the units.

8. A cushioned draft device for mine cars comprising in combination with a car end member, a T-shaped portion projecting from the main portion of the end member and having the head spaced outwardly thereof, a draft element carried by the end member, and rubber cushioning units engaging the inner surfaces of the T-head on either side of the web of the T and operatively connected to the draft element to yieldingly resist through compression of the rubber units the draft forces applied to the draft element and to transfer such forces directly through the T-shaped portion to the end member.

9. A cushioned draft device for mine cars comprising in combination with a car end member, a T-shaped portion projecting from the main portion of the end member, said T shaped portion having the web thereof positioned substantially horizontal and the head spaced outwardly from the main portion of the end member, a draft element carried by the end member, and rubber cushioning units engaging the inner surfaces of the head of the T shaped portion on either side of the web thereof whereby the draft forces absorbed by the units will be substantially equally distributed on either side of said web, said rubber cushioning units being operatively connected to the draft element and acting in compression to yieldingly resist draft forces applied to the draft element.

10. A cushioned draft device for mine cars comprising in combination with a car end member, a T shaped portion projecting from the main portion of the end member, said T shaped portion having the web thereof positioned substantially horizontal and the oppositely directed flanges located outwardly of the main portion of the end member in spaced relation thereto, a draft element carried by the end member and at least partially enclosing the T shaped portion, and rubber cushioning units engaging the inner surfaces of the oppositely directed flanges on either side of the web of the T shaped portion whereby the draft forces absorbed by the units will be substantially equally distributed on either side of said web, said rubber cushioning units being operatively connected to the draft element and acting in compression to yieldingly resist draft forces applied to the draft element.

11. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T shaped portion projecting from the main portion of the end member, said T shaped portion having the web thereof positioned substantially horizontal and at substantially the horizontal center plane of the end member and having the oppositely directed flanges located outwardly of the main portion of the end member in spaced relation thereto, an S shaped buffer and coupling element carried by the end member with the lower portion of said element enclosing the T shaped portion, coupling means extending across the upper portion of said element, and resilient cushioning units cooperating with said lower portion of the element and with the inner and outer surfaces of the oppositely directed flanges of the T shaped portion, said resilient cushioning units acting in compression to yieldingly resist relative movements of the said element and end member under buffing or coupling strains and to transfer such strains directly through the web of the T-shaped portion to the central portions of said end member.

12. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T shaped portion projecting outwardly from the main portion of the end member, said T shaped portion having the web thereof positioned substantially horizontal and at substantially the horizontal center plane of the end member and having the oppositely directed flanges located outwardly of the main portion of the end member in spaced relation thereto, a buffer and coupling element carried by the end member and at least partially enclosing the said T shaped portion, resilient cushioning units engaging the said element and outer surfaces of the oppositely directed flanges of the T shaped portion for yieldingly resisting inward movement of said element under buffing forces, and additional resilient cushioning units engaging the inner surfaces of the oppositely directed flanges of the T shaped portion and cooperating with said element for yieldingly resisting outward movement of the element under draft forces, said units and T- shaped portion being so formed and arranged as to transfer said forces through said web to the central portions of the end member.

13. A cushioned buffer and coupling device for mine cars comprising in combination with a car end member, a T shaped portion projecting outwardly from the main portion of the end member, said T shaped portion having the web thereof positioned substantially horizontal and the oppositely directed flanges located outwardly of the main portion of the end member and in spaced relation thereto, a buffer and coupling element carried by the end member and at least partially enclosing the said T shaped portion, cushioning units engaging the element and outer surfaces of the oppositely directed flanges of the T shaped portion for yieldingly resisting inward movement of said element, and additional cushioning units located on either side of the web of the T shaped portion and engaging the inner surfaces of the outwardly directed flanges for yieldingly resisting outward movement of the element relative to the end member, said additional cushioning units being rotatably connected to said element to thereby equalize the strains on the additional cushioning units.

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